FINAL

Environmental Impact Statement for BRAC 2005 Disposal and Reuse of Fort Monroe, Virginia

Prepared by:

U.S. Army Corps of Engineers: Mobile District

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May 2010

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Prepared by:

U.S. Army Corps of Engineers
Mobile District

6 May 2010

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Colonel, U.S. Army Corps of Engineers
Commanding

DATE

Approved by:

Fort Monroe, Virginia

12 May 2010

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FINAL ENVIRONMENTAL IMPACT STATEMENT

LEAD AGENCY: Department of the Army

COOPERATING AGENCIES: None

AFFECTED JURISDICTIONS: Commonwealth of Virginia and the Cities of Hampton, Newport News, Norfolk, and Virginia Beach

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ABSTRACT: This Final Environmental Impact Statement (FEIS) considers the proposed implementation of the Base Realignment and Closure (BRAC) recommendations at Fort Monroe, Virginia. The FEIS identifies, evaluates and documents the effects of property disposal and reuse on the environment and economic and social conditions at Fort Monroe that would result from the implementation of the base closure action mandated by the 2005 BRAC Commission. A No Action alternative is also considered. The principal significant adverse effects, both direct and indirect, from disposal and reuse of Fort Monroe are to transportation. There would also be significant adverse cumulative effects on noise and to transportation.

FEIS PUBLICATION: The U.S. Environmental Protection Agency announced the publication of the FEIS in its Notice of Weekly Receipts (NWR) of Environmental Impact Statements published in the *Federal Register.* Not less than 30 days after publication of the NWR, the Army will sign a Record of Decision (ROD) that will include an overview of the alternatives considered for Fort Monroe, state which of the alternatives considered in the FEIS will be implemented, and include mitigation measures associated with the chosen alternative. During the period between publication of the NWR and the ROD, copies of the FEIS can be obtained by contacting Mr. Robert Reali, Fort Monroe BRAC Environmental Coordinator, Directorate of Public Works, 318 Cornog Lane, Fort Monroe, Virginia 23651-1110, or: monr.post.nepapublic@us.army.mil. Copies have also been provided to the libraries listed in Section 6 of the FEIS.

FINAL ENVIRONMENTAL IMPACT STATEMENT ORGANIZATION

This FEIS addresses the proposed action to implement the 2005 BRAC recommendations at Fort Monroe, Virginia. It has been developed in accordance with the National Environmental Policy Act and implementing regulations issued by the Council on Environmental Quality (Title 40 *Code of Federal Regulations* [CFR] 1500–1508) and the Army (32 CFR 651). Its purpose is to inform decision-makers and the public of the likely environmental and socioeconomic consequences of the proposed action and alternatives.

An ***EXECUTIVE SUMMARY*** briefly describes the proposed action, environmental and socioeconomic consequences, and mitigation measures.

CONTENTS

SECTION 1.0: PURPOSE, NEED, AND SCOPE summarizes the purpose of and need for the proposed action and describes the scope of the environmental impact analysis process.

SECTION 2.0: PROPOSED ACTION describes the proposed action to implement the BRAC Commission's recommendations at Fort Monroe.

SECTION 3.0: ALTERNATIVES examines alternatives to implementing the proposed action.

SECTION 4.0: AFFECTED ENVIRONMENT AND CONSEQUENCES describes the existing environmental and socioeconomic settings at Fort Monroe and identifies potential effects of implementing the proposed action and alternatives.

SECTION 5.0: PREPARER'S LIST identifies the preparers of the document.

SECTION 6.0: DISTRIBUTION LIST indicates recipients of this FEIS.

SECTION 7.0: REFERENCES provides bibliographical information for cited sources.

SECTION 8.0: PERSONS CONSULTED lists persons and agencies consulted during preparation of this FEIS.

SECTION 9.0: ACRONYMS AND ABBREVIATIONS lists acronyms and abbreviations used in the document.

APPENDICES

- ***A PUBLIC MEETINGS AND COMMENTS***
- ***B FORT MONROE REUSE PLAN***
- ***C RECORD OF NON-APPLICABILITY CONCERNING THE GENERAL CONFORMITY RULE (40 CFR 51)***
- ***D NOISE ASSESSMENT DISCUSSION***
- ***E AGENCY CONSULTATION LETTERS***
- ***F PROGRAMMATIC AGREEMENT FOR CLOSURE AND DISPOSAL OF FORT MONROE, VIRGINIA***
- ***G ECONOMIC IMPACT FORECAST SYSTEM (EIFS) – MODELING RESULTS***
- ***H TRANSPORTATION STUDIES***

EXECUTIVE SUMMARY

INTRODUCTION

The 2005 Base Closure and Realignment (BRAC) Commission made recommendations for realignment and closure actions for military installations on 8 September 2005, in conformance with the provisions of the Defense Base Closure and Realignment Act of 1990 (Base Closure Act), Public Law (Pub. L.) 101-510 as amended. These recommendations included the closure of Fort Monroe, Virginia. In the absence of congressional disapproval, the BRAC Commission's recommendations became binding on 9 November 2005. Under the Base Closure Act, all Department of the Army (Army) missions at Fort Monroe must cease or be relocated and the Army's excess real property interests at Fort Monroe will be disposed of and transferred to new owners according to all applicable laws, regulations, and national policy; closure is required by no later than 15 September 2011.

Prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), this Environmental Impact Statement (EIS) evaluates the environmental and socioeconomic impacts of closing the installation and disposing of the non-reversionary property and considers reasonable reuse alternatives. The EIS also considers the cumulative impacts of potential reuses of the property.

BACKGROUND

Fort Monroe is a 565-acre United States (U.S.) Army garrison located on Old Point Comfort at the southeastern tip of the Virginia Lower Peninsula between Hampton Roads and the Lower Chesapeake Bay. Fort Monroe is located on a peninsula surrounded by the waters of the lower Chesapeake Bay, the harbor of Hampton Roads, and Mill Creek. The northern boundary of the installation abuts the City of Hampton community of Buckroe.

The hallmark of Fort Monroe is the largest stone fort and moat ever constructed in the U.S. A wood stockade fort was built on the site in 1609, primarily to protect the Jamestown colonists. That fort was destroyed by fire and, and a series of progressively stronger and larger forts were built and lost to storms. Construction began on the present-day fort in 1819 with completion in 1834. While Old Point Comfort has shown that it is vulnerable to the elements, its location at the mouth of the Chesapeake Bay was chosen for strategic defense advantages. Fort Monroe became the keystone of the nation's coastal defense system following the War of 1812.

Upon completion, the primary mission of Fort Monroe was to guard Hampton Roads Harbor. Its secondary military objective was to protect the lower Chesapeake Bay, and in so doing, it restricted access to Washington, DC. Today, Fort Monroe's mission is to provide quality base operations support for national defense agencies while preparing the Fort Monroe community for the future. Tenant organizations are the U.S. Army Training and Doctrine Command (TRADOC) Headquarters, the Installation Management Command Northeast Region Headquarters, the U.S. Army Network Enterprise

Technology Command Northeast Region Headquarters, the Army Contracting Agency Northern Region Office, the U.S. Army Accessions Command, Joint Task Force Civil Support, the 902nd Military Intelligence Group, and the U.S. Army Cadet Command.

The developed southern half of Fort Monroe, where virtually all of the buildings are located, includes over 250 building structures, including 113 housing buildings, 60 administrative buildings, garages, support buildings, and the stone fort itself. Most of the building square footage at Fort Monroe is used for professional office space. Administrative space includes public works, information management, safety, public affairs, legal counsel, civilian and military personnel, resource management, health and dental clinics. Morale, welfare, and recreation facilities include the marina, bowling alley, RV park, and fitness center. Other space includes digital photograph processing, grounds maintenance buildings, mechanical and structural shops, entomology shop, U.S. Navy boat testing and maintenance facilities, waste accumulation facility, and gas stations.

Non-federal facilities located on Fort Monroe include the Chamberlin, Saint Mary Star of the Sea Catholic Church and Rectory, and the Old Point National Bank. The Old Point Comfort Lighthouse is owned and operated by the U.S. Department of Homeland Security (U.S. Coast Guard). Fort Monroe also includes grass-covered vacant land, wetlands, shallow water areas, beaches, paved roads, and parking lots.

The stone fortification, which will revert to the Commonwealth, has granite walls that are 10 feet thick at the base and 12 feet high. These were designed to support approximately 400 guns. Earthwork and stone casemates increase the total wall thickness to as much as 95 feet at the base. Ramps are incorporated into the earthen berms to more easily move troops and weapons to the top of the wall.

The fort was designed to support a peacetime garrison of approximately 600 men and a wartime population of approximately 2,600 soldiers and officers. In 1825, more than one-tenth of the entire U.S. Army was garrisoned within its walls. Present population is approximately 3,500, including 1,400 military and 2,100 civilian or contract employees (Department of Defense [DoD] 2005). Over 800 soldiers and family members reside on post.

Fort Monroe, and the fortifications that preceded it, have played a dominant role in every major American military conflict, from the Revolutionary War through the current wars, including Higher Headquarters Command support and TRADOC Headquarters for Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom in Iraq. In recognition of the many significant events that have taken place within its boundaries over nearly four centuries, and the value of its structures as examples of American military architecture and community, Fort Monroe has been designated a National Historic Landmark (NHL).

PROPOSED ACTION AND ALTERNATIVES

The proposed federal action analyzed in this EIS is to dispose of the surplus property generated by the BRAC-mandated closure of Fort Monroe, Virginia. Reuse of non-

reverting property at Fort Monroe by others is a secondary action resulting from disposal. Under provisions of the Base Closure Act, Pub. L. 101-510 mandates the initiation of closure and realignment actions no later than two years after the president transmits the recommendation to the congress and actual closure and realignment actions no later than six years after the president transmits the recommendation to the congress. The proposed federal action for this installation will be the disposal and reuse of surplus non-reverting property. Evaluation of the impact from the reuse of the remaining reverting property is also included in this EIS as a cumulative effect.

Moves of tenant organizations are planned to be complete by 15 September 2011, the date on which the Army must cease performance of its active Army missions at Fort Monroe.

The DoD recognized the Fort Monroe Federal Area Development Authority (FMFADA) as the Local Redevelopment Authority (LRA) for the reuse planning associated with Fort Monroe, so the terms FMFADA and LRA are, in this case, interchangeable. As of 1 June 2010, the FMFADA has become an independent Commonwealth agency known as the Fort Monroe Authority (FMA).

With occupation in colonial times, before the existence of a federal government, this property was in military use by the Virginia Colony. Over the years, additional land has either naturally accreted through coastal processes or has been filled with imported materials. When Fort Monroe is no longer used for national defense purposes, there will be property reverting to the Commonwealth of Virginia, property disposed of by the federal government, and reversion or disposal of the accreted and filled properties depending on which entity is determined to be the owner.

A large number of historically significant structures and sites are located within Fort Monroe. In 1960, the Secretary of the Interior declared the stone fort at Fort Monroe to be a NHL, and upon enactment of the National Historic Preservation Act of 1966, Fort Monroe was placed on the National Register of Historic Places (NRHP).

The Army and the Virginia Department of Historic Resources continue to work together to identify all contributing elements and features of the NRHP. The Chamberlin, Saint Mary's Church and Rectory, and the Old Point Comfort Lighthouse are also contributing elements within the Fort Monroe NHL and district, but are not owned or managed by the Army. The Old Point Comfort Lighthouse and the Chamberlin are also individually listed on the NRHP and the Chamberlin was individually listed on the Virginia Landmarks Register in December 2006.

Within the FMFADA-developed Reuse Plan for Fort Monroe are five basic essentials that emerged as a result of the public input received at the Hampton Federal Area Development Authority (FADA) Public Planning Workshops and other public meetings held since 2006. The five basic essentials are:

- Protecting the historical significance of Fort Monroe;

- Assuring the property is open and accessible;
- Establishing a large-scale open park space;
- Seeking economic sustainability; and
- Allowing new development within strict limitations.

The Reuse Plan is presented in Appendix B of this EIS.

Prior to disposal, the Army may find it necessary to maintain the non-reverting portions of Fort Monroe for an undetermined period. Though it is the goal of this round of BRAC to dispose quickly of federal properties for reuse, if disposal of BRAC properties were delayed, the Army would employ two levels of maintenance under the caretaker status alternative: initial and long-term.

DISPOSAL PROCESS

Under BRAC law, continuation of Army operations at Fort Monroe is not feasible. There is no alternative to closure as described by the 2005 BRAC Commission's recommendation without further legislative action.

Once closure of Fort Monroe became law, the Army began the screening process by offering its excess federal property not subject to reversion to other DoD agencies and federal agencies for their potential use. As a result, the Army transferred Big Bethel Reservoir and Water Treatment Plant, a satellite property of Fort Monroe that lies approximately nine miles northwest of the installation, to the U.S. Air Force. The entire property, which consisted of 447 acres of land and 46.5 acres of easements, was transferred in July 2006. No other agencies requested property. This included the National Park Service (NPS) and its parent agency, the U.S. Department of the Interior.

Consistent with the Federal Property and Administrative Services Act, screening notices were sent to federal agencies that approve or sponsor public benefit conveyances and appropriate state and local agencies in the vicinity of the property. The Army initiated this screening after coordination with the Hampton FADA. In response to this screening, the Army received no requests for transfer of federal property.

For non-reverting property, the Army has identified two disposal alternatives (early transfer and traditional), a caretaker status alternative, and the no action alternative. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendation for closure. With the early transfer alternative, the Army would utilize various property transfer and disposal methods that allow for reuse before environmental remedial action has been completed. Under the traditional disposal alternative, the Army would transfer or dispose of property once environmental remediation is completed for individual parcels of the installation. The caretaker status alternative would arise in the event the Army is

unable to dispose of any or all portions of the non-reverting property within the period of initial maintenance.

Three reuse scenarios, based on a range of redevelopment intensities, encompass the community's reuse plan and are evaluated as secondary actions. The EIS addresses reuse of all property on Fort Monroe, (e.g., Wherry Quarter, Parks and Recreation area to the north, North Gate, Historic Village, and Inner Fort), including property that will revert back to the Commonwealth of Virginia as part of the plan for reuse.

Applicable laws and regulations that pertain to each of the alternatives are outlined in Section 1.4. With respect to permits, no specific permits are required of the Army for implementation of their actions under the alternatives evaluated in this EIS. However, applicable permits would be required upon implementation of redevelopment of Fort Monroe, which will be the responsibility of other entities.

The Reuse Plan is the primary referral source in development of the reuse scenarios and effects analysis in the Army's NEPA process for the disposal action. The Army expresses no preference with respect to reuse scenarios because decisions implementing reuse will be made by other entities.

REUSE ALTERNATIVES

The reuse planning process is dynamic and often dependent on market and general economic conditions beyond the control of the reuse planning authority. In recognition of the complexities attending reuse planning, the Army uses intensity-based probable reuse scenarios to identify the range of reasonable reuse alternatives required by NEPA and by DoD implementing directives. Rather than speculatively predicting exactly what will occur at a site, the Army establishes ranges or levels of activity that reasonably might occur. These levels of activity, referred to as intensities, provide a flexible framework capable of reflecting the different kinds of uses that could result at a location.

The Reuse Plan, signed on 20 August 2008, by the Honorable Tim Kaine, Governor of the Commonwealth of Virginia, is provided as Appendix B to this EIS. The Reuse Plan presents concepts and limits for future use within each of the five land management zones:

1) Inner Fort;

2) Historic Village and Entry Gate;

3) North Gate;

4) Wherry Quarter; and

5) Parks and Recreation Areas.

Each of the planning essentials and management zones is discussed in detail in the Reuse Plan.

With five distinct land management zones to consider, the FMA is focusing reuse of Fort Monroe on multiple land-use options and financial resources. The Reuse Plan proposes various land uses within each zone, all of which will be open to the general public. The end state of redevelopment and reuse will be determined gradually over time as the balance between preservation, development, and economic viability is fine-tuned.

Controlling the future of Fort Monroe are federal and state laws, protective covenants, the enforceable programs of the Commonwealth of Virginia, and the Programmatic Agreement (PA), prepared by the Army in consultation with and signed by the NPS, the Governor of the Commonwealth of Virginia, the Virginia State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation, and other consulting parties (see Appendix F). Because of these restrictions, the maximum reasonably foreseeable intensity of reuse is considered to be within the brackets defined in this EIS. To bracket potential reuse of Fort Monroe, three separate levels of intensity will be analyzed, including a Lower Bracket, Middle Bracket, and Upper Bracket. The Middle Bracket is considered to be commensurate with long-term build-out of the Reuse Plan. The Lower Bracket and Upper Bracket provide ranges of intensity meant to bound reasonable long-term redevelopment of Fort Monroe. The Lower Bracket scenario would be commensurate with a recreational tourism destination (e.g., beaches, open space, military museums, historic structures, accommodations, and amenities), with reduced employment and limited changes to existing structures as compared to current conditions. The Upper Bracket scenario would be similar to the Reuse Plan, but with higher residential and commercial development than what is assumed for the Middle Bracket scenario. This increased development is principally associated with redevelopment in the Wherry Quarter. These brackets are fully defined in Section 3.3.5 of the EIS.

The Executive Summary of the Reuse Plan discusses, on pages 5-7, the NPS's reconnaissance study on making Fort Monroe a national park. The study concluded that while the resources of Fort Monroe are likely to meet the criteria for national significance and suitability as a national park should a Special Resource Study be authorized by congress, it would be unlikely that all of Fort Monroe would be feasible for NPS designation. The study also concluded that even the stone fort itself would require a strong and financially sustainable partner for long-term viability as a NPS unit. The NPS proposed to offer technical assistance in devising plans for the historic preservation of the fort's resources and development of a master plan to promote public understanding and appreciation of Fort Monroe. The NPS also found that current and anticipated NPS budget constraints make it "unlikely" that the historic fort itself (the area inside the moat) would be feasible for inclusion in the NPS without strong, substantial financial support to manage, maintain, and operate it. As such, the Reuse Plan signed by the governor does not include a NPS unit.

The FMFADA board voted on 19 November 2009 to request that a portion of Fort Monroe be managed as a NPS unit, with ownership of the land retained by the Commonwealth of

Virginia. The specific area proposed includes the "Old Quarters #1, the stone fort structure and moat, the outer works of the fort, Batteries Parrott and Irwin (Endicott-era coastal batteries), and the radar station on the fort's parapet". Fort Monroe historic resources will be managed in accordance with the PA. Therefore, the effect on historic properties will be identical regardless of whether the management responsibility lies with the NPS, the Commonwealth of Virginia, the FMA, or any other entity or entities.

ENVIRONMENTAL CONSEQUENCES

The evaluated resource areas include land use, aesthetics and visual resources, air quality, noise, geology and soils, water resources, biological resources, cultural resources, socioeconomics, transportation, utilities, and hazardous and toxic substances. Direct and indirect impacts of each disposal alternative on the resource areas include a variety of short- and long-term impacts, both adverse and beneficial. In most instances, the effects noted below would be most prominent at the conclusion of redevelopment activities, which may occur 20 years in the future following property transfer (i.e., 20 years beyond 2011, which is 2031).

DISPOSAL ALTERNATIVES

Early Transfer Disposal Alternative. With early transfer, parcels could become available for redevelopment and reuse sooner under this disposal alternative than under any other and at least minor short- and long-term adverse effects would be expected to occur for all resource areas. In addition, minor beneficial effects would be expected to occur in the areas of land use, aesthetics and visual resources, cultural resources, socioeconomics, transportation, and utilities. There would also be moderate beneficial effects to socioeconomics and cultural resources as well as moderate adverse effects to land use and cultural resources. Significant adverse effects could be expected to occur in the context of transportation and for the cumulative effects to noise.

Traditional Disposal Alternative. For traditional disposal, effects similar to those described for early transfer would be expected, but would occur further in the future.

Caretaker Status Alternative. For the caretaker status alternative, minor adverse effects would be expected to occur for all resources areas with the exception of air quality, noise, and water resources. Some localized minor beneficial effects would be expected to occur in the areas of air quality, geology and soils, water resources, biological resources, transportation, and hazardous and toxic substances. There would also be moderate beneficial effects to land use and noise. No significant adverse effects, either direct, indirect, or cumulative, were identified for caretaker status. Any eventual redevelopment and subsequent reuse would be delayed under this alternative.

No Action Alternative. The no action alternative would result in no new adverse direct, indirect, or cumulative impacts.

REUSE ALTERNATIVES

Direct, indirect, and cumulative effects of the three reuse scenarios evaluated have the potential for a variety of adverse and beneficial short- and long-term effects. As a result of future property reuse at full build-out (i.e., 2031), significant adverse effects could be expected to occur in the area of transportation. Significant cumulative effects resulting from noise are expected at full build-out, as well.

***Lower Bracket Reuse*.** Minor adverse or beneficial effects would be expected for all resource areas with the exception of cultural resources, which are expected to have a direct moderate beneficial effect. In addition, indirect moderate beneficial effects would be expected for land use. No significant adverse or beneficial effects were identified for any resource area.

Middle Bracket Reuse. At least minor short- and long-term adverse effects would be expected to occur for all resource areas. In addition, minor beneficial effects would be expected to occur in the areas of land use, aesthetics and visual resources, socioeconomics, transportation, and utilities. As a result of future property reuse significant adverse effects could be expected to occur in the context of transportation at full build-out (i.e., in 2031). Significant cumulative effects from noise are expected at full build-out, as well.

Upper Bracket Reuse. Effects similar to the Middle Bracket would be expected, but with a slighter greater intensity due to higher residential development. As a result of future property reuse significant adverse effects could be expected to occur in the context of transportation. Significant cumulative effects from noise are expected as well.

Table ES-1 presents a summary of direct, indirect and cumulative effects by resource area associated with each of the disposal and reuse alternatives evaluated in the EIS.

Table ES-1 Summary of Effects from Disposal and Reuse of Fort Monroe

Resource Areas	Early Transfer Disposal			Traditional Disposal			Caretaker Status			No Action			Lower Bracket			Middle Bracket			Upper Bracket		
	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative	Direct	Indirect	Cumulative
Land Use	◘■	○	◘■	◘■	○	◘■	☼	◘	◘				○	○☼		○■	○	○◘■	○■	○	○◘■
Aesthetic/Visual Resources	○◘		◘	○◘		◘	◘■		◘■				○◘	○		○◘	◘	◘	○◘	◘	◘
Air Quality	◘		◘	◘		◘	○		○				○◘	○		◘	◘	◘	◘	◘	◘
Noise	◘■	◘	◘■■	◘■	◘	◘■■	☼	○	○				○			◘■	◘	◘■■	◘■	◘	◘■■
Geology and Soils	◘			◘			◘	○	○				◘			◘			◘		
Water Resources	◘		◘	◘		◘	○						○		◘	◘		◘	◘		◘
Biological Resources	◘■		◘	◘■		◘	○◘		○				○			◘■		◘	◘■		◘
Cultural Resources	◘■○☼			◘■○☼			◘■						☼			◘☼			■☼		
Socioeconomics	◘○☼	○◘	○	◘○☼	◘○	○	◘	◘	◘				○◘	○◘	◘	◘○☼	○◘	○◘	◘○☼	◘○	○
Transportation	◘■■○	■■	■■	◘■■	■■	■■	○◘						○		◘	○◘■■	■■	■■	◘■■	■■	■■
Utilities	○◘		◘	○◘		◘	◘		■				○			○◘		◘	○◘		◘
Hazardous/Toxic Substances	◘	◘		◘	◘		○	◘	○◘				○◘	○		◘	◘		◘	◘	

○ Beneficial Effect (Minor
☼ Beneficial Effect (Moderate)
● Beneficial Effect (Significant)
NOTE: No significant beneficial effects were identified.
[BLANK CELL] No or Negligible Effects Expected

◘ Adverse Effects (Minor)
■ Adverse Effects (Moderate)
■ Adverse Effects (Significant)
Adverse Effects (Significant) - Middle Bracket and Upper Bracket apply as a result of future property reuse.

MITIGATION AND MANAGEMENT MEASURES

The Army's methodology for ensuring environmentally sustainable redevelopment of BRAC disposal property includes identifying natural and man-made resources that must be protected after ownership transfers out of federal control.

The Army creates encumbrances to protect specific resources when required by a specific statute or as a result of agreements with regulatory agencies. For example, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120 requires deeds to include a right of the U.S. to re-enter the property to undertake remedial action. Federal deed restrictions, which would apply only to non-reversionary land, run with the land forever or until removed in accordance with its own terms. In other cases, statutes may impose restrictions on all owners. In such cases, a specific encumbrance is not required.

Federal, state, and local regulations and policies applying to entities that receive properties at Fort Monroe will govern to a large extent the appropriate use and conservation of the environment, including air quality, wetlands resources, water quality, cultural resources, and other resources. Beyond such regulations and policies, mitigation measures may be implemented by the Army or the FMA in order to reduce adverse effects from disposal and redevelopment of Fort Monroe according to the principles of sound and sustainable planning. The Army has committed to items of mitigation that are stipulated in the PA between the U.S. Army and other federal and state entities (Appendix F and summarized in Section 4.15). Specific mitigation measures the Army commits to perform for both disposal alternatives are outlined below.

- Incorporation in the deeds and continuing enforcement of historic preservation restrictions, covenants, and/or easements on non-reversionary land.

- If a site investigation or remediation will or may have an adverse effect on certain properties, the Army will develop a plan, in consultation with the SHPO, to avoid, protect, or recover information or prepare appropriate documentation. The Army will also be required to determine whether or not such activities will have a potential affect on cultural landscapes that contribute to the NHL District, and prepare a landscape treatment plan if necessary in accordance with the terms outlined in the PA.

- Identify significant viewsheds from and toward the Fort Monroe NHL District within 18 months of the execution of the PA.

- Submit a Cultural Landscape Study within 18 months of the execution of the PA that will document the evolution of the land form at Fort Monroe from its earliest known occupation to the present.

- Conduct property management to the standard of DoD Base Redevelopment and Realignment Manual (1 March 2006) until transfer out of Army ownership.

Property management requirements will include: continued consultation on non-BRAC undertakings in accordance with 26 Code of Federal Regulations Part 800; development of protections for deeds and lease agreements, as well as adherence to administrative requirements specified in the PA; and provide schedule updates regarding vacating buildings to the Commonwealth and FMA.

- Mothballed buildings and structures that have been or will remain vacant for 12 months or longer, or if there is no planned use for them, will be preserved in accordance with NPS guidance found in NPS Preservation Brief 31 and related requirements outlined in the PA.

- Revise the Fort Monroe NHL District nomination to more clearly define boundaries of the NHL and to more accurately identify those buildings, structures, objects, archaeological sites, historic viewsheds, and landscape features that contribute to the Fort Monroe NHL District.

- Complete draft NRHP nominations for those buildings at Fort Monroe identified as individually eligible and submit them to the SHPO for review and concurrence, and then submit the nominations to the NPS for listing.

- Consider, under the guidance of the U.S. Army Center of Military History, the on-site loan of all or part of the collections pertinent to Fort Monroe's historic significance.

- Provide, upon request by the FMA, copies of specific archival materials (letters, photos, documents, etc.) and information on individual artifacts (accession records, files, notes, etc.) from the Casemate Museum's indexed collection.

- Conduct additional archaeological testing within the boundary of Fort Monroe to identify any remnant of the former Freedmen's Cemetery (current field investigations are ongoing and will be reported separately from the EIS process).

- Establish, within 18 months of the execution of the PA, procedures to make available to the FMA and to the Commonwealth appropriate documents related to historic and other properties on Fort Monroe, such as maintenance records, architectural plans, survey materials and similar documents, to facilitate the proper management of Fort Monroe.

- Provide notice to the FMA and the Commonwealth of the future locations of all collections removed from Fort Monroe. The FMA and the Commonwealth may request, from the Army, access to such collections in accordance with Army policies and regulations.

Additional deed notification and restrictions required of the Army and the FMA in keeping with the assumptions of this EIS, along with potential mitigation measures that will ensure successful management of environmental resources according to the principles of sound environmental planning, are outlined below for each alternative.

Early Transfer/Traditional Disposal Alternatives. Beyond the mitigation requirements specified in the PA, the Army will implement appropriate management measures to fulfill obligations pertaining to Army policy and regulations relative to property disposal, and may implement additional mitigation to avoid, reduce, or compensate for adverse effects that might occur as a result of early transfer or traditional disposal, as outlined below.

- Develop conveyance documents that would notify future owners of particular notification requirements concerning natural and cultural resources, in accordance with Army regulations and policies (see Appendix F). Conveyance documents would also identify past hazardous substance activities at each site, as required by CERCLA and the Community Environmental Response Facilitation Act, including restrictions on land use (e.g., groundwater use).

- Continue to work with the FMA to ensure that disposal transactions are consistent with the adopted Reuse Plan.

- Continue remediation actions as prioritized by the Army and completing all required remediation prior to traditional disposal.

- Maintain installation buildings, infrastructure, and natural resources to the extent provided by Army policy and regulations until final disposal.

- Manage all environmental resources to ensure that the federal facility remains in compliance with state and federal laws and local regulations.

Caretaker Status Alternative. Beyond the mitigation requirements specified in the PA, the Army will implement appropriate management measures to fulfill obligations pertaining to Army policy and regulations relative to caretaker conditions, and may implement additional mitigation to avoid, reduce, or compensate for adverse effects that might occur as a result of early transfer or traditional disposal, as outlined below.

- Conduct installation security and maintenance operations to the extent provided by federal policies and regulations.

- Continue to identify clean or remediated portions of the installation excess properties and prioritize restoration and cleanup activities.

- Recycle solid waste and debris where practicable.

- Continue with remediation actions as prioritized by the Army.

- Maintain necessary natural and cultural resources management measures, including continued close coordination with other agencies.

- Actively support the leasing of property over the interim period between closure and redevelopment, where environmental restoration efforts permit, to provide for

job creation, habitation and maintenance of structures, and rapid reuse of the installation.

No Action Alternative. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure. This continuation of operations would include the continuation of the Army's obligations as stewards of environmental and cultural resources, as required by federal laws, policies and executive orders. Thus, no changes to existing effects would occur relative to continuation of the Army's mission relative to conditions in November 2005.

Reuse Scenarios. Under the intensity-based reuse scenarios, non-Army entities would assume reuse planning and execution of redevelopment actions. Measures to reduce or avoid impacts associated with intensity-based reuse scenarios, including specific mitigation measures, except for those related to federally protected interests, remediation, or other Army concerns, are not the responsibility of the Army but are the responsibility of those who are redeveloping the property. As previously discussed, the Army would develop conveyance documents and implement other measures to mitigate adverse effects from reuse, including implementing mitigation measures specified in the PA for the protection of cultural resources. Specific mitigation measures to reduce adverse effects to the transportation network from future property reuse are outlined in Section 4.11 and Appendix H, while measures to reduce other adverse effects are outlined in Section 4.15.

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Table of Contents

Tables

Figures

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1.0 PURPOSE, NEED, AND SCOPE

1.1 PURPOSE AND NEED

Recommendations of the 2005 Base Closure and Realignment (BRAC) Commission, also known as the 2005 BRAC Commission, made on 8 September 2005 made in conformance with the provisions of the Defense Base Closure and Realignment Act of 1990 (Base Closure Act), Public Law (Pub. L.) 101-510, as amended, included the closure of Fort Monroe, Virginia (Defense Base Closure and Realignment Commission 2005). In the absence of congressional disapproval, the 2005 BRAC Commission's recommendations became binding on 9 November 2005. The Fort Monroe installation property has been determined to be surplus to Department of the Army (Army) needs and will be disposed of according to applicable laws and regulations (see Section 2.0 for further details). The purpose of the proposed action is to carry out the 2005 BRAC Commission's recommendations. The proposed action supports the Army's obligations under the Base Closure Act and to transfer the excess non-reverting property to new owners.

Pursuant to the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations, the Army has prepared this Environmental Impact Statement (EIS) to evaluate the environmental and socioeconomic impacts of closing the installation and disposing of the non-reverting property and to consider reasonable reuse alternatives. The EIS also considers the cumulative impacts of potential reuses of the large portion of the property that will revert to the Commonwealth of Virginia according to deed provisions established when the Army was granted ownership of the property.

1.2 SCOPE

This EIS has been developed in accordance with NEPA and associated implementing regulations issued by the Council on Environmental Quality (CEQ), Code of Federal Regulations (CFR), 40 CFR 1500–1508 and the Army implementing regulation, "Environmental Analysis of Army's Actions" (32 CFR Part 651). Its purpose is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives. This EIS identifies, documents, and evaluates the potential environmental effects of non-reverting property disposal and the effects of reasonably foreseeable reuses of the property on which Fort Monroe is located.

The Base Closure Act specifies that NEPA does not apply to actions of the president, the BRAC Commission, or Department of Defense (DoD) except "(i) during the process of property disposal, and (ii) during the process of relocating functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected but before the functions are relocated." Specifically, the Base Closure Act specifies in Section 2905(c)(2) that in applying the provisions of NEPA to the process, the Secretary of Defense and the secretaries of the military departments concerned do not have to consider (i) the need for closing or realigning the military installation which has been recommended for closure or realignment by the BRAC Commission, (ii) the need for transferring functions to any military installation, or (iii)

military installations alternative to those recommended or selected. Accordingly, this EIS does not address the need for closure or realignment. NEPA does, however, apply to disposal of excess federal property as a direct Army action and the reuse of such property as a secondary effect of disposal; therefore, those actions are addressed in this document.

For this EIS, the proposed action is to dispose of the non-reverting property generated by the BRAC-mandated closure of Fort Monroe. The non-reverting property accounts for approximately 193 of the 565 acres of property within Fort Monroe. When the Army ceases to use Fort Monroe for national defense purposes, ownership of approximately 372 acres of "reverting property" granted by the 1838 and 1936 deeds will automatically pass from the United States (U.S.) to the Commonwealth of Virginia. Upon such occurrence, the Commonwealth will have the same titles that it granted to the U.S.

This EIS analyzes the disposal of approximately 193 acres of non-reverting property as the federal action and the cumulative environmental effects resulting from the reuse of the 372 reverting acres. Two disposal alternatives (early transfer and traditional) are identified in the EIS for the non-reverting property, as well as a caretaker status alternative, which might arise prior to disposal, and the no action alternative.

In addition to disposal alternatives for the proposed federal action, three reuse intensities are evaluated as secondary actions on all property at Fort Monroe. These are based on a range of reuse intensities encompassing the Reuse Plan developed by the Fort Monroe Federal Area Development Authority (FMFADA). These alternatives and scenarios, and the rationale for their selection, are further described in Section 3.0. Cumulative impacts from reuse on the reverting property are included in the evaluation of the secondary actions.

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, and military technicians performed the impact analysis. The team identified the affected resources, analyzed the proposed action against the existing conditions, and determined the relevant beneficial and adverse effects associated with the action. Section 4.0, Affected Environment and Consequences, describes the baseline conditions of the affected resources at Fort Monroe as of November 2005. The environmental consequences of disposal and reuse are also described in Section 4.0.

1.3 PUBLIC INVOLVEMENT

1.3.1 NEPA Public Involvement Process

The Army invited full public participation in the Fort Monroe BRAC NEPA process to promote open communication and better decision making. All persons and organizations that had a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, were urged to participate in the NEPA environmental analysis process.

Public comments were welcomed throughout the NEPA process. Formal opportunities for public participation followed the Army's publication of a Notice of Intent (NOI) to prepare an EIS and included submission of comments on the scope of the environmental evaluation, review of the Draft EIS (DEIS), presentation of comments at a public meeting held during the DEIS review period, and review of the Final EIS (FEIS) before the initiation of the proposed action. Each of these steps in the process is briefly discussed below.

1.3.2 Notice of Intent

The NOI is the first formal step in the NEPA public involvement process. It notified the public that an EIS would be prepared. The agency proposing an action publishes the notice in the *Federal Register* prior to the start of the scoping process. The NOI includes a description of the proposed action and gives the name and address of an agency contact person. An NOI announcing the Army's intent to prepare an EIS for the disposal and reuse of Fort Monroe was published in the *Federal Register* on 19 September 2008 (see Appendix A).

1.3.3 Scoping Process

The purpose of scoping is to solicit public and agency comment on issues or concerns that should be addressed in the EIS. It is designed to involve the public early in the EIS process. Public comments are solicited through mailings, media advertisements, and both agency and public scoping meetings. Although informal comments are welcome at any time throughout the process, the scoping period and the scoping meeting provide formal opportunities for public participation in and comment on the environmental impact analysis process.

Although not part of the NEPA process, public input on reuse scenarios was solicited by the Hampton Federal Area Development Authority (FADA) in 2006. This process began with the Fort Monroe Public Planning Workshops in late July of that year, attended by more than 200 people. Additional discussion on the Hampton FADA and the public's reuse concepts are discussed in Section 2.2.3 Community Reuse. The Hampton FADA became the FMFADA in 2007 by enactment of Virginia Senate Bill 1392 and maintains an ongoing account of public involvement related to the Reuse Plan on their website <http://www.fmfada.com>. As of 1 June 2010, the FMFADA has become an independent Commonwealth agency known as the Fort Monroe Authority (FMA).

The Army conducted a Public Scoping Meeting for an Environmental Assessment (EA) of the proposed action at the City of Hampton's Sandy Bottom Nature Center on the evening of 30 January 2007. During this open house forum, the public and agencies were given a verbal presentation on the BRAC mandated closure of Fort Monroe and the Army's plan to close the installation and dispose of non-reverting property. Attendees were able to visit various resource area stations and, with the aid of large graphics, storyboards and handouts, converse with subject matter experts on NEPA, Section 106 of the National Historic Preservation Act (NHPA), members of the Fort Monroe Restoration Advisory

Board, and the Hampton FADA. At this meeting attendees were also invited to comment on the scope of the EA for a 30-day period, and that period was later extended. This extension allowed, in total, 72 days for providing comment. Comments received during the Fort Monroe scoping process are contained in Appendix A. Public comments requesting an EIS and screening analyses to indicate the potential for significant adverse impacts led the Army's decision to prepare this EIS for the proposed action. The public comments received during preparation of the EA were considered in the development of the DEIS, in addition to the public comments received during the scoping process discussed below.

The Army published a NOI to prepare an EIS in the 19 September 2008 edition of the *Federal Register* and on the evening of 28 October 2008, the Army conducted a Public Scoping Meeting for the EIS in the Virginia Room of Northampton Community Center located at 1435-A Todds Lane, Hampton, Virginia 23665. This meeting was announced in the two largest local newspapers – the Virginian Pilot and the Daily Press – and a letter of invitation was sent to a mailing list of approximately 90 addresses that included U.S. senators and members of congress, Virginia's governor, state senators and delegates, federal and state agencies, local government officials, Native American tribes, and community and special interest groups.

In attendance beyond those representing the Army and the Scoping Meeting support personnel were Virginia Department of Transportation (VDOT) staff (two) and City of Hampton, Planning (one). Also present were the Buckroe Civic Association (one), Rain for Rent (one), and private citizens (five). The private citizen group included a Hampton city councilwoman. Comments received during the Scoping Meeting are presented in Appendix A.

1.3.4 Public Review of Draft EIS

A Notice of Availability (NOA) of the DEIS was published by the U.S. Environmental Protection Agency (USEPA) in the *Federal Register* on 11 September 2009, while the full text of the Army's NOA was published on 14 September 2009. A news release was published on 11 September 2009 in each of the primary newspapers serving the Fort Monroe vicinity, including the Virginian-Pilot and the Daily Press. Copies of the DEIS were also sent to offices and individuals on the distribution list, as well as to individuals who requested copies in response to the NOA. Names on the list were compiled from a variety of sources, including sources at the installation. All persons, agencies, and organizations thought to have potential interest in the Army's action were included. In addition, copies of the DEIS were provided to the main public libraries in the vicinity of Fort Monroe. The DEIS was also made available on the web at <http://www.hgda.army.mil/acsimweb/brac/nepaeisdocs.htm>.

1.3.5 Public Meeting

The Army conducted a public meeting on the evening of 6 October 2009 at the Hampton Roads Convention Center, 1610 Coliseum Drive, Hampton, Virginia 23666-4350, to solicit

comments concerning the DEIS. This meeting was announced through public notices, printed on 11 September 2009 in each of the major newspapers serving the Fort Monroe vicinity, including the Virginian-Pilot and the Daily Press, encouraged all interested parties to attend, including Native American tribes, federal, state, and local agencies, and the public. These announcements coincided with the *Federal Register* printing of the NOA which was published by the USEPA on 11 September 2009. In addition, over 100 individual invitations from the Fort Monroe Directorate of Public Works (DPW) were issued to various interested parties, including federal and state agencies, local interest groups, American Indian tribal representatives, local elected officials, media contacts, and local information repositories. These invitations were sent on 8 September 2009 and contained information detailing the locations in which the DEIS had been made available for review and the details regarding the public meeting. A copy of the invitation and invitation mailing list is provided in Appendix A.

At the public meeting, welcoming remarks were provided by Bob Edwards, acting deputy garrison commander, Fort Monroe, followed by Mr. Richard Muller. Mr. Muller then provided an explanation of the approach for preparation of the DEIS, briefly touching on each resource area discussed in the DEIS. Upon conclusion of Mr. Muller's discussion, the floor was opened for a questions and answer session. Appendix A includes the agenda, other meeting materials, a list of attendees at the public meeting, and a transcript of the public meeting. Approximately 40 individuals were present at the public meeting.

Several participants engaged the speakers during the question and answer session. A detailed summary of these discussions is provided in the Public Meeting Transcript (see Appendix A). The Army's responses to oral comments received during the meeting are included in the Comments and Responses matrix provided in Appendix A.

1.3.6 Final EIS

The Army considered all comments, both individually and collectively, that were provided by the public and agencies on the DEIS that were received during the 48-day public comment period. The FEIS incorporates changes suggested by those commenting on the DEIS, as appropriate, and contains responses to all comments received during the public comment period (i.e., 11 September 2009 through 29 October 2009; Note: the public comment period was extended 3 days in case individuals failed to see the NOA published by the USEPA on 11 September [which is the official start of the comment period], but only saw the NOA published by the Army on the next business day of 14 September). All comments on the DEIS are provided in Appendix A, along with the Army's responses.

An NOA for the FEIS will be published in the *Federal Register* and display ads announcing the document's availability will also be published in each of the major newspapers serving the Fort Monroe vicinity, including the Virginian-Pilot and the Daily Press. Copies of the FEIS will be mailed to all offices and individuals who received the DEIS and to those who request copies. The FEIS distribution will also include any person, organization, or agency that submitted substantive comments on the DEIS. Additionally, copies of the FEIS will be placed in the main public libraries in the vicinity of Fort Monroe.

Following announcement of the availability of the FEIS, there is a 30-day waiting period. At the end of this period, the Army will prepare a Record of Decision (ROD), which will select from the alternatives discussed in this EIS. Once the ROD is signed the Army may proceed with the proposed action.

1.4 FRAMEWORK FOR ANALYSIS

Numerous factors contribute to Army decisions relating to disposal of the surplus property. The land that reverts directly to the Commonwealth of Virginia does not fall under the provisions of these disposal considerations as these lands cannot be disposed by deed or otherwise made subject to Army restrictions on future use. The Base Closure Act triggers action under several other federal statutes and regulations. In addition, the Army must adhere to specific rules and procedures pertaining to transfer of non-reverting property as well as executive branch policies. There are also practical concerns such as identifying base assets to allow for disposal in a manner most consistent with statutory and regulatory guidance. These matters are further discussed below.

1.4.1 BRAC Procedural Requirements

***Statutory Provisions*.** The two laws that govern real property disposal in BRAC are the Base Closure Act and the Federal Property and Administrative Services Act (FPASA) (Title 40 of the U.S. Code [U.S.C.], Sections 101 and following, as amended). The disposal process is also governed by 32 CFR Part 174 (Revitalizing Base Closure Communities) and 32 CFR Part 176 (Revitalizing Base Closure Communities – Base Closure Community Assistance), the President's Program to Revitalize Base Closure Communities and the Pryor Amendment that gives legal authority to the President's Program (see below), and regulations issued by DoD to implement BRAC law.

***Screening Process*.** Having been recommended for closure, the Fort Monroe property has been determined to be excess to Army needs and, therefore, subject to specific procedures to identify potential subsequent public-sector users. The property has been offered to a hierarchy of potential users through procedures called the screening process. This process and its results to date are discussed in Section 2.3.4, Real Estate Disposal Process.

***The President's Program to Revitalize Base Closure Communities*.** On 2 July 1993, President Clinton announced a major new program to speed the economic recovery of communities near closing military installations. The president pledged to give top priority to early reuse of each closing installation's most valuable assets. A principal goal of the initiative was to provide for rapid redevelopment and creation of new jobs. In announcing the program, the president outlined the five parts of his community revitalization plan:

- Job-centered property disposal that puts local economic redevelopment first

- Fast-track environmental cleanup that removes delays while protecting human health and the environment[1]
- Appointment of transition coordinators at installations slated for closure
- Easy access to transition and redevelopment help for workers and communities
- Larger economic development planning grants to base closure communities

The Army is fully committed to the President's Program to Revitalize Base Closure Communities. A BRAC Environmental Coordinator and a Base Transition Coordinator have been appointed for the Fort Monroe property, and the Army has taken an active role in providing assistance to local officials in the community.

***The Pryor Amendment*.** Congress endorsed the president's plan by enacting the Base Closure Communities Assistance Act (contained in Title XXIX, Pub. L. 103-160), popularly known as the "Pryor Amendment" in recognition of its principal legislative sponsor. This act, as amended, provides legal authority to carry out the president's plan by granting conveyances of real and personal property to a Local Redevelopment Authority (LRA). In the case of Fort Monroe, the FMA has been recognized as the LRA by DoD. Specifically, the act created a new federal property mechanism, the Economic Development Conveyance (EDC). An EDC can help induce a market for the property, thereby enhancing economic recovery and generating jobs. The Army is required to seek fair-market-value consideration for EDC of property on installations that were approved for closure or realignment after 1 January 2005. Some flexibility is given to the military departments and the communities to negotiate the terms and conditions of the EDC. A detailed application, including an approved community redevelopment plan, serves as the basis for determining an LRA's eligibility for an EDC. DoD's regulations implementing the Pryor Amendment appear at 32 CFR Parts 174 and 176. The EDC is further described in Section 2.3.4, Real Estate Disposal Process.

1.4.2 Relevant Statues and Executive Orders (E.O.)

Numerous factors contribute to Army decisions relating to disposal of installation property including mission requirements, schedule, availability of funding, and environmental considerations. In addressing environmental considerations, the Army is guided by several relevant statutes (and their implementing regulations) and E.O.s that establish standards and provide guidance on environmental and natural resources management and planning. These include, but are not limited to, the Clean Air Act (CAA); Clean Water Act (CWA); Coastal Zone Management Act (CZMA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Noise Control Act; Endangered Species Act (ESA); NHPA; Archaeological Resources Protection Act; Migratory Bird

[1] Fast-track cleanup per the President's Program to Revitalize Base Closure Communities is no longer being exercised by the Army.

Treaty Act (MBTA); Native American Graves Protection and Repatriation Act (NAGPRA); American Indian Religious Freedom Act; Resource Conservation and Recovery Act (RCRA); Community Environmental Response Facilitation Act (CERFA); Toxic Substances Control Act (TSCA); E.O. 11988 (Floodplain Management); E.O. 11990 (Protection of Wetlands); E.O. 12088 (Federal Compliance with Pollution Control Standards); E.O. 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations); E.O. 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds); E.O. 13045 (Protection of Children from Environmental Health Risks and Safety Risks); and E.O. 13508 (Chesapeake Bay Protection and Restoration). Key provisions of these statutes and E.O.s are described in more detail, as needed, in the text of this EIS.

1.4.3 Other Reuse Regulations and Guidance

DoD's Office of Economic Adjustment published its Community Guide to Base Reuse in May 1995. The guide describes the base closure and reuse processes that have been designed to help with local economic recovery and summarizes the many assistance programs administered by DoD and other agencies. In 2006, DoD published its DoD Base Redevelopment and Realignment Manual (BRRM) (DoD 4165.66-M) to prescribe the procedures on how to reuse and redevelop bases. BRRM is a DoD instruction manual prepared for DoD agencies. In part, it describes procedures for use by DoD to transfer property in a manner that facilitates reuse and redevelopment. Private entities are not constrained by the BRRM with regard to redevelopment of excess BRAC property. DoD and the U.S. Department of Housing and Urban Development (HUD) have published guidance (at 32 CFR Part 176) required by Title XXIX of the National Defense Authorization Act for Fiscal Year (FY) 1994. The guidance establishes policy and procedures, assigns responsibilities, and delegates authority to implement the President's Program to Revitalize Base Closure Communities (2 July 1993), as endorsed through congressional enactment of the Pryor Amendment (see above).

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 INTRODUCTION

The proposed action (Army primary action) is to dispose of the excess property generated by the BRAC-mandated closure of Fort Monroe, Virginia. Reuse of non-reverting property at Fort Monroe by others is a secondary action resulting from disposal. Although reuse of property that will revert back to the Commonwealth of Virginia is not a secondary effect of the federal disposal action, it would be considered a cumulative impact. In order to avoid an unnecessarily disjointed analysis, the effects of reverted lands will be analyzed as part of the Reuse Plan in this EIS.

Fort Monroe is a 565-acre U.S. Army garrison located at the southeastern tip of the Virginia Lower Peninsula between Hampton Roads and the Lower Chesapeake Bay (Figure 2.1-1).

Fort Monroe is the largest moat encircled stone ever built in the U.S. Construction began in 1819 and was completed in 1834, but the first fort to occupy the site dates back to 1609, when a timber and earthwork stockade known as Fort Algernourne was completed. It was destroyed by fire in 1612. Fort Algernourne was followed by what was known only as “the fort at Point Comfort,” built in 1632 and lost to an ocean storm in 1667. Fort George was next, completed in 1728 and then destroyed by a hurricane in 1749. As it stands today, Fort Monroe is located on a peninsula surrounded by the waters of the lower Chesapeake Bay, the harbor of the Hampton Roads, and Mill Creek. The installation’s northern extension ties into land in the Hampton, Virginia community of Buckroe Beach.

Fort Monroe is accessible by two low bridges that converge at the main gate. Downtown Hampton is just west of Fort Monroe, and the Hampton community of Phoebus, through which all motor vehicle traffic approaching Fort Monroe must pass, lies to the northwest. Other major nearby cities include Newport News, Norfolk, Virginia Beach, and Portsmouth. All these have had strong relationships to military organizations, and the military currently employs many residents of these surrounding cities. More distant is historic Williamsburg, located about 30 miles northwest of Fort Monroe. Richmond is about 75 highway miles northwest of Fort Monroe, and 175 highway miles to the north is Washington, DC.

The other principal military installations on Virginia’s Hampton Roads Peninsula are: Langley Air Force Base (AFB), the site of the National Aeronautics and Space Administration (NASA) Research Center and Headquarters for the Air Combat Command; Fort Eustis, home of the Army Transportation Corps and a major training installation; the Yorktown Naval Weapons Station; and Camp Peary. Across Hampton Roads Harbor are Naval Air Station (NAS) Oceana, Little Creek Amphibious Base, Fort Story, and Naval Base Norfolk. Naval Base Norfolk is the world's largest naval base, with about 71,000 active duty military and 16,000 civilian personnel assigned to support more than 130 ships, 25 aircraft squadrons, and 70 major commands.

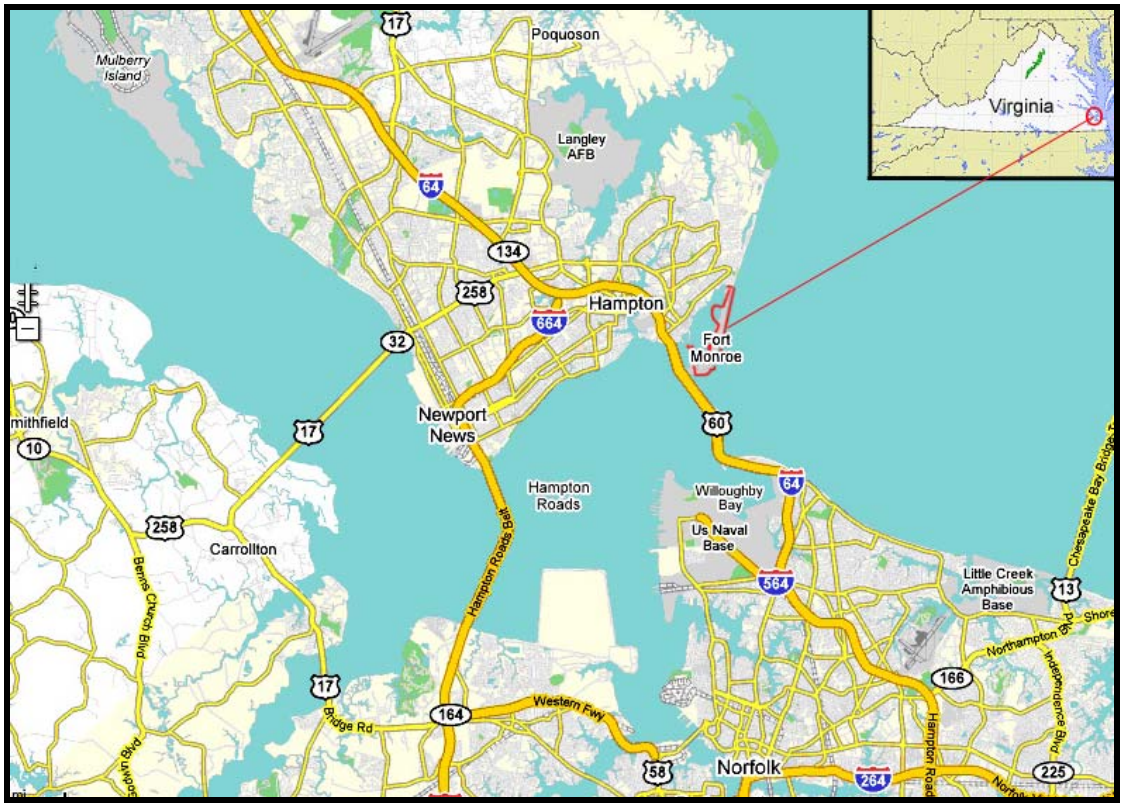

Figure 2.1-1 Location Map

Despite Old Point Comfort's apparent vulnerability to the elements, its location at the mouth of the Chesapeake Bay had been repeatedly chosen as a defense site for its strategic advantages. Fort Monroe became the keystone of the nation's coastal defense system following the War of 1812.

The original mission of Fort Monroe was to guard Hampton Roads Harbor. Its secondary mission was to protect the lower Chesapeake Bay and access to Washington, DC. Today, Fort Monroe's mission is to provide quality base operations support for national defense agencies while preparing the Fort Monroe community for the future.

Over 250 building structures at Fort Monroe include 113 housing buildings, 60 administrative buildings, garages, support buildings, and the stone fort itself. Most of the building square footage at Fort Monroe is used for professional office space. Administrative space includes public works, information management, safety, public affairs, legal counsel, civilian and military personnel, resource management, health and dental clinics. Morale, welfare, and recreation facilities include the marina, bowling alley, RV park, and fitness center. Other space includes digital photograph processing, grounds maintenance buildings, mechanical and structural shops, entomology shop, U.S. Navy boat testing and maintenance facilities, waste accumulation facility, and gas stations.

Non-federal facilities located on Fort Monroe include the Chamberlin, St. Mary Star of the Sea Catholic Church and Rectory, and the Old Point National Bank. The Old Point Comfort Lighthouse is owned and operated by the U.S. Department of Homeland Security (U.S. Coast Guard [USCG]) and is not part of the disposal action. Fort Monroe also includes grass-covered vacant land, wetlands, shallow water areas, beaches, paved roads, and parking lots.

There are several military tenant organizations at Fort Monroe. The largest and most significant is Headquarters, U.S. Army Training and Doctrine Command (TRADOC). TRADOC recruits, trains, and educates the Army's soldiers; develops leaders; supports training in units; establishes standards; and builds the future Army. As the Army's principal combat developer, TRADOC guides, coordinates, and integrates the Army's total combat effort and develops and maintains the total Army training system.

The stone fortification, which occupies 63 acres, will revert to the Commonwealth of Virginia with closure of the installation. The granite walls, 10 feet thick at the base and 12 feet high, were designed to support approximately 400 guns. Earthwork and stone casemates increase the total wall thickness to as much as 95 feet, providing a slope to more easily move troops and weapons to the top of the wall. The fort was planned to support a peacetime garrison of approximately 600 men and a wartime population of approximately 2,600 soldiers and officers. In 1825, more than one-tenth of the entire U.S. Army was garrisoned within its walls. Fort Monroe now carries a total daytime population of approximately 3,500, including 1,400 people in uniform and 2,100 civilian and contract employees. Over 800 soldiers and their families reside on post. In addition, the Chamberlin provides 133 apartment suites for occupancy by the general public.

Fort Monroe, and the fortifications that preceded it, have played a role in every major American military conflict, from the Revolutionary War to Operations Enduring Freedom in Afghanistan and Iraqi Freedom in Iraq. In recognition of the many significant events that have taken place within its boundaries over nearly four centuries, and the value of its structures as examples of American military architecture and community, since 1960 Fort Monroe has been designated a National Historic Landmark (NHL).

2.2 IMPLEMENTATION PROPOSED

2.2.1 Army Disposal Action

Actions recommended for Fort Monroe, Virginia, by the Commission are: "Close Fort Monroe, VA. Relocate TRADOC Headquarters, the Installation Management Agency Northeast Region Headquarters, the U.S. Army Network Enterprise Technology Command, Northeast Region Headquarters and the Army Contracting Agency Northern Region Office to Fort Eustis, VA. Relocate the U.S. Army Accessions Command and U.S. Army Cadet Command to Fort Knox, KY." (Defense Base Closure and Realignment Commission 2005). BRAC Law states that these realignments must be completed by 15 September 2011.

The proposed federal action analyzed in this EIS is to dispose of the surplus property generated by the BRAC-mandated closure of Fort Monroe, Virginia. Reuse of non-reverting property at Fort Monroe by others is a secondary action resulting from disposal. Under provisions of the Base Closure Act, Pub. L. 101-510 mandates the initiation of closure and realignment actions no later than two years after the president transmits the recommendation to the congress and actual closure and realignment actions no later than six years after the president transmits the recommendation to the congress. The proposed federal action for this installation will be the disposal and reuse of surplus non-reverting property. Evaluation of the impact from the reuse of the remaining reverting property is also included in this EIS as a cumulative effect.

2.2.2 Property Considerations

Fort Monroe includes both reverting and non-reverting property. Table 2.2-1 lists the acreage of the property categories and Figure 2.2-1 shows the corresponding locations.

Table 2.2-1 Land Acreages at Fort Monroe, Virginia

Reversionary Property (acres)			
	Wetlands	**Dry Land**	**Total**
Area 1	0	371.8	371.8
Non-Reversionary Property (acres)			
Area 2	0	31.6	31.6
Area 3	0	38.8	38.8
Area 4	32.2	90.1	122.3
Sub-Total	**32.2**	**160.5**	**192.7**
Combined (acres)			
TOTAL	32.2	532.3	**564.5**
Note: All acreage figures compiled from the Fort Monroe Boundary Survey, Final Submittal 17 August 2009.			

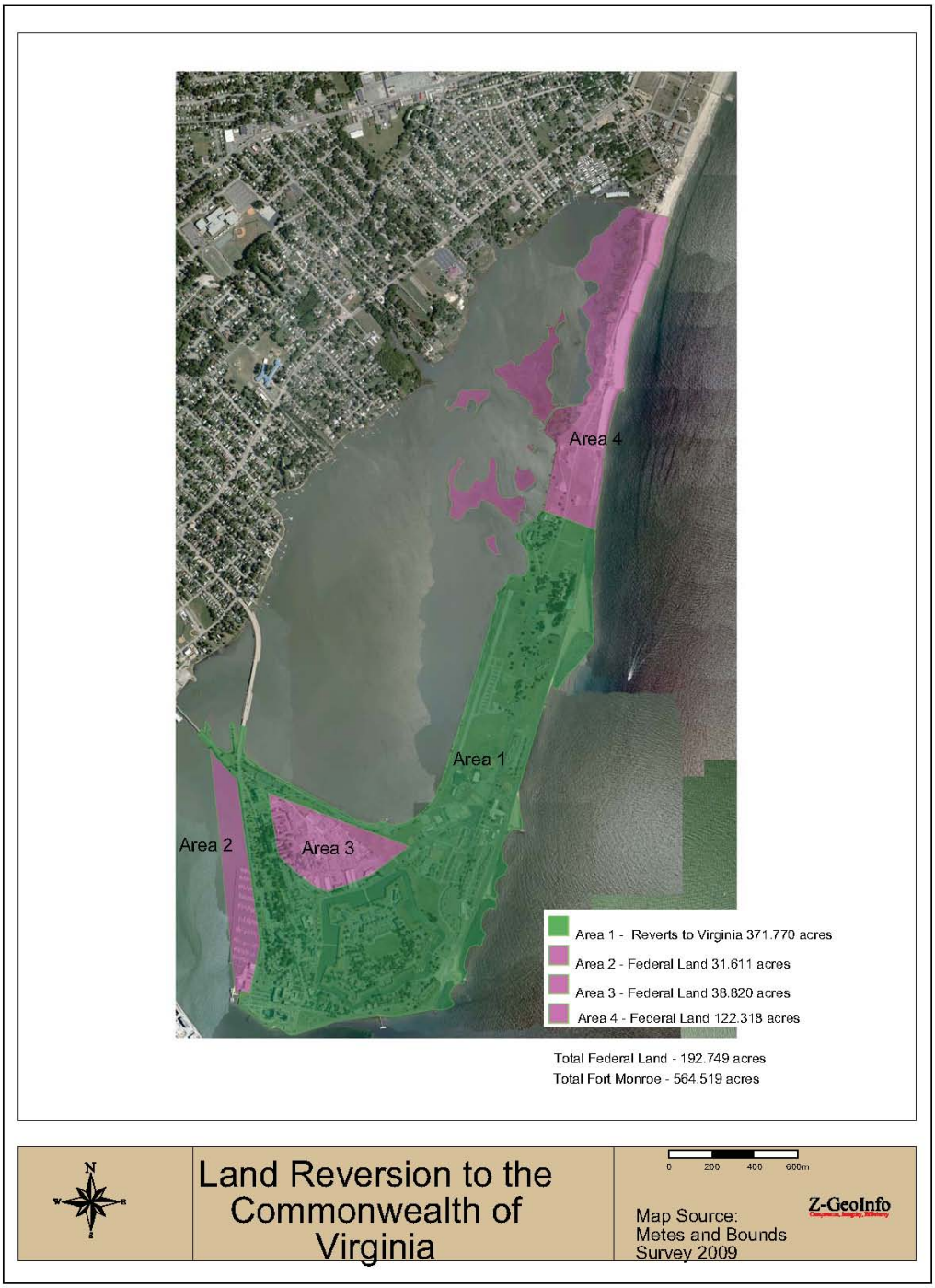

Figure 2.2-1 Property Categories at Fort Monroe, Virginia

2.2.3 Community Reuse

DoD recognizes the FMA as the LRA for the reuse planning associated with Fort Monroe, so the terms FMA and LRA are, in this case, interchangeable. The FMA consists of a chairman, an executive director, eighteen board members (seven appointed by the governor: five from his cabinet and two non-legislative members with recent and significant experience – one in historic preservation, one in heritage tourism), seven members named by the Hampton City Council, and four elected officials. The executive director, staff, consultants, and advisory groups support the FMA but are not board members.

Within the Reuse Plan for Fort Monroe are five basic essentials that emerged as a result of the public input received at the Hampton FADA Public Planning Workshops held in July 2006. (The Army does not plan reuse or solicit comments on reuse and therefore did not participate in these workshops.) The five basic essentials are:

- Protecting the historical significance of Fort Monroe;
- Assuring the property is open and accessible;
- Establishing a large-scale, open park space;
- Seeking economic sustainability; and
- Allowing new development within strict limitations.

The Reuse Plan is presented in Appendix B of this EIS.

2.2.4 Implementation

The BRAC process of property disposal includes predisposal activities and real estate disposal, which in turn allow for subsequent reuse development. Predisposal activities may include, but are not limited to, NEPA compliance, Section 106 coordination in accordance with the NHPA, property inventories and title reviews, completion of environmental remediation (unless early transfer is negotiated), interim uses, and caretaking of vacated facilities until disposal. In transferring or conveying federally-owned property at Fort Monroe, the Army would identify encumbrances consistent with requirements of law, or that would arise through the implementation of environmental remedies. Section 3.2.5 provides details on the encumbrances expected to exist at the time of transfer.

2.3 DISPOSAL PROCESS

2.3.1 Maintenance of Property Until Disposal

Prior to disposal, the Army may find it necessary to maintain the federal non-reversionary portions of Fort Monroe for an undetermined period. If disposal of BRAC properties were delayed, the Army would employ two levels of maintenance.

Initial Maintenance. From the time of operational closure until conveyance of the property, the Army would provide for maintenance procedures to preserve and protect those facilities and items of equipment needed for reuse in a manner that facilitates redevelopment in accordance with Army regulations and the Programmatic Agreement (PA). The levels of maintenance during this initial period would not exceed maintenance standards in effect before approval of the closure decision or as required by the PA. Maintenance would not include any property improvements such as construction, alteration, or demolition. In an appropriate case, however, demolition of non-historic buildings could occur if required for health, safety or environmental reasons.

Long-Term Maintenance. In the unlikely event that the property were not transferred, the Army would reduce maintenance levels to the minimum level for surplus government property required by 41 CFR 101-47.402, 41 CFR 101-47-4913, the PA, and by Army Regulation 420-70 (*Building and Structures*). Long-term maintenance would not be focused on keeping the facilities in a state of repair to permit rapid reuse. Rather, maintenance during this period would consist of minimal activities intended primarily to ensure security and to avoid deterioration. This reduced level of maintenance would continue indefinitely until disposal.

2.3.2 Contaminated Sites

Unless inclusion of the CERCLA covenant in the deed is deferred, site remediation activities must be completed before an individual surplus property parcel may be transferred, and these parcels may be transferred in advance of uncertified parcels. To determine the baseline nature of contamination on Fort Monroe as a result of past activities, the U.S. Army prepared an Environmental Condition of Property (ECP) report (U.S. Army. 2006a). To conduct this study, the property was divided into 18 sections, by type of use, to facilitate analysis of site data and reporting the findings. The findings of the ECP are presented in Section 4.13, Hazardous and Toxic Substances.

2.3.3 Interim Uses

During the period of transition preceding property transfer, the Army may enter into an interim lease that would terminate, transfer, or be assigned at the time the property conveys or reverts to its new owner. In such a case, the Army will consult with the FMA before entering into such a lease.

2.3.4 Real Estate Disposal Process

The Army may dispose of the Fort Monroe non-reverting property as a single transfer or in parcels. After identification of parcels, disposal may occur to meet objectives related to reuse goals, tax revenue generation, and job creation. Methods available to the Army for property disposal include EDC, public benefit discount conveyance, negotiated sale, competitive sale, and exchanges for military construction.

- ***Economic Development Conveyance (EDC).*** The 1994 Defense Authorization Act provides for conveyance of property to an LRA to promote economic development and job creation in the local community. An EDC is not intended to supplant other non-reverting property disposal authorities. The Army is required to

seek fair-market-value consideration for EDC conveyance of property on installations that were approved for closure or realignment after 1 January 2005. To qualify for an EDC, the LRA must submit a request to the Army describing its proposed economic development and job creation program.

- ***Public Benefit Disposal Conveyance.*** State or local government entities may obtain property when sponsored by a federal agency for uses that would benefit the public such as education, parks and recreation, wildlife conservation, or public health.

- ***Negotiated Sale.*** The Army would negotiate the sale of the property to state or local governmental entities including tribal governments or to private parties at fair market value.

- ***Competitive Sale.*** Sale to the public would occur through either an invitation for bids or an auction.

- ***Exchanges for Military Construction.*** Section 2869 of Title 10 U.S.C. provides an alternative authority for disposal of real property at a closing or realigning installation. This authority allows any real federal property not subject to reversion at such an installation to be exchanged for military construction on that or another location.

- ***Conservation Conveyance.*** Title 10 U.S.C. 2694a allows the military to convey property to state or local government agencies, as well as nonprofit organizations, to conserve natural resources. The deed of the property must include a reversion clause in the event that the property is no longer used for conservation purposes.

- ***Conveyance for Cost of Environmental Remediation.*** Pub. L. 101-510 stipulates that the Military Department may convey property to an entity that agrees to undertake the responsibility for a portion or all of the remaining environmental actions on the property, such as environmental clean-up actions. Under this provision, the Military Department would pay the entity the difference between the fair market value of the property and the total remediation costs, if such costs exceed the fair market value. Otherwise, if the environmental costs are below the fair market value of the property, then the entity would pay the Military Department the difference.

DoD and Federal Agency Screening. The Army began the screening process by offering its excess non-reverting property not subject to reversion to other DoD agencies and federal agencies for their potential use. As a result, the Army transferred to the U.S. Air Force (USAF) Big Bethel Reservoir and Treatment Plant a satellite property of Fort Monroe that lies approximately 9 miles northwest of the installation. The entire property, which consisted of 447.2 acres of land and 46.53 acres of easements, was transferred in July 2006. The screening process has concluded and no agencies other than the USAF requested property. This included the National Park Service (NPS) and its parent agency, the U.S. Department of the Interior (DOI).

LRA Screening. Pursuant to the Base Closure Community Redevelopment and Homeless Assistance Act of 1994, federal property not subject to reversion that is surplus to the federal government's needs is to be screened through an LRA's soliciting notices of interest from state and local governments, representatives of the homeless, and other interested parties. An LRA's outreach efforts to potential users or recipients of the property include working with the HUD and other federal agencies that sponsor public benefit transfers under the federal FPASA. The Reuse Plan incorporates the notices of interest submitted to the LRA and reflects an overall reuse strategy for the installation.

Public Agency Screening. Consistent with the FPASA, screening notices were sent to federal agencies that approve or sponsor public benefit conveyances and appropriate state and local agencies in the vicinity of the property. The Army initiated this screening after coordination with the Hampton FADA, which was the original LRA for Fort Monroe. In response to this screening, the Army received no requests for transfer of property not subject to reversion.

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3.0 ALTERNATIVES

3.1 INTRODUCTION

This section addresses alternatives for the Army's primary action of disposal of non-reverting property (i.e., property that will not revert back to the Commonwealth of Virginia) and for the secondary action of property reuse by other entities of this same property. Pursuant to the Base Closure Act and the 2005 BRAC Commission's recommendation pertaining to Fort Monroe, continuation of Army operations at Fort Monroe is not feasible. There is no alternative to closure as described by the BRAC Commission's recommendation without further legislative action. For non-reverting property, the Army has identified two disposal alternatives (early transfer and traditional), a caretaker status alternative, and the no action alternative. Three reuse scenarios, based on a range of redevelopment intensity, encompass the community's reuse plan and are evaluated as secondary actions. Future reuse of Fort Monroe property is analyzed in the context of land use intensity categories, as described in Section 3.3.2. Furthermore, the EIS addresses reuse of property that will revert back to the Commonwealth of Virginia as part of the plan for reuse.

The Reuse Plan is the primary factor in the development of reuse scenarios and effects analysis in the Army's NEPA process for the disposal action. Consideration of the Reuse Plan along with the proposed federal action aids both the community and the Army in achieving informed decision making and consensus on reuse at Fort Monroe.

3.2 DISPOSAL ALTERNATIVES

3.2.1 No Action Alternative

Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the BRAC Commission's recommendation for closure. However, implementation of this alternative is not possible in light of the BRAC closure recommendation's having the force of law. Inclusion of the no action alternative is prescribed by the CEQ regulations implementing NEPA and serves as a benchmark against which federal actions can be evaluated. Accordingly, the no action alternative is evaluated in this EIS.

3.2.2 Early Transfer Alternative

Under this alternative, the Army has available various property transfer and disposal methods that allow the reuse of the property to occur before environmental remedial action has been completed. This method of early disposal, allowable under the provision of Section 120 (h)(3)(C) of CERCLA, would be to defer the requirement to complete all necessary environmental cleanup prior to the transfer of the property and parcels could become available for redevelopment and reuse sooner under this disposal alternative than under any other. This provision, known as early transfer authority (ETA), authorizes the deferral of the CERCLA covenant requiring Army to warrant that all remedial actions

have been completed. Virginia's governor must concur with the deferral request for property at Fort Monroe.

ETA is not an actual conveyance mechanism, just a deferral of the CERCLA covenant based on a finding that:

- The property is suitable for transfer for the use intended by the transferee, and the intended use is consistent with protection of human health and the environment;
- The deed or other agreement proposed to govern the transfer between the U.S. and the transferee of the property contains specified assurances;
- The federal agency requesting deferral has provided notice, by publication in a newspaper of general circulation in the vicinity of the property, of the proposed transfer and of the opportunity for the public to submit, within a period of not less than 30 days after the date of the notice, written comments on the suitability of the property for the transfer; and
- The deferral and the transfer of the property will not substantially delay any necessary response action at the property.

3.2.3 Traditional Disposal Alternative

Under this alternative, the Army would transfer or dispose of property once environmental remediation is completed for individual parcels of the installation. Under traditional disposal, if a particular long-term environmental remedy is deemed to be working and approved, the Army may transfer the land while continuing obligations for limited environmental actions, such as continued monitoring, five-year review, and continued operation of remedy systems (such as a groundwater recovery system).

The Army is required under CERCLA, as amended by CERFA, to identify uncontaminated property within 18 months of the date the property is selected for closure. The Army has categorized parcels through the analysis documented in the ECP report for Fort Monroe. For the purposes of CERFA, uncontaminated property is defined as areas where no release or disposal of hazardous substances or petroleum products has occurred, including any migration of these substances from adjacent areas. The CERFA Report, which identified the uncontaminated properties, was submitted to the regulatory agencies on 10 January 2007. The Virginia Department of Environmental Quality (VDEQ) did not concur with these designations due to perceived data gaps that the agency believed existed. Supplemental studies and investigations were initiated and a Draft Site Investigation report was published in February 2008. Additional investigation work was completed in 2009 and will continue in 2010 (see Section 4.13 for further details).

If a portion of a property has been contaminated, and the Army opts for traditional disposal, then it must be able to certify that actions necessary to protect human health or the environment have been taken before the transfer or disposal. Traditional disposal may include land use restrictions which preclude, limit, or reduce the duration of contact with

environmental media. These restrictions can take the form of general use restrictions, such as prohibiting residential use, or more specific restrictions, such as prohibiting the use of groundwater. Transfer of property not fully remediated is allowed if a long-term environmental remedy is shown to be operating properly and successfully. Specifically, under traditional disposal, properties that have been classified as Categories 1, 2, 3, or 4 per the American Society for Testing and Materials (ASTM) 5746-98, *Standard Classification of Environmental Conditions of Property Area Types for BRAC Facilities*, would be suitable for transfer. For properties classified as Categories 2, 3, and 4, a release of contaminants may have occurred. The Category 2 designation is limited to releases of petroleum products, even if those releases have been cleaned up. Category 3 describes releases of hazardous substances below an amount that poses an unacceptable risk to human health or the environment. Because of the nature of the release, a response of cleanup action is not required. A Category 4 parcel had at one time been contaminated by a release of hazardous substances at levels that posed an unacceptable risk to human health or the environment, but is currently remediated to an acceptable level of risk, or by long-term remedy that is considered to be operating properly and successfully. For properties currently classified as Category 5, 6, or 7, transfer of property is not allowed under traditional disposal. These properties would need to undergo continued environmental actions until they can be reclassified (such as ensuring that a long-term environmental remedy is shown to be operating properly and successfully and a parcel has been reclassified from Category 5 or 6 to a Category 4). In addition, Category 7 parcels still require evaluation or additional investigation work to determine the nature and extent, if any, of the environmental contamination.

Some environmental remedial actions may take a long time to be selected, approved, and implemented. Therefore, there may be a prolonged period under this alternative during which parcels are not available for transfer or disposal. Furthermore, it is possible that an installation would be moved to long-term caretaker status during this period as discussed further in Section 3.2.4 Caretaker Status Alternative.

3.2.4 Caretaker Status Alternative

The caretaker status alternative would arise in the event that the Army is unable to dispose of any or all portions of the non-reverting property within the period of initial maintenance (Section 2.3.1). Once the time period for initial maintenance elapses, and if the Army has not yet disposed of its property, the Army would then reduce maintenance to levels consistent with federal government standards for excess and surplus properties (i.e., 41 CFR 101–47.402 and 101–47.4913), Army Regulation 420–70 (*Buildings and Structures*), and with the PA. This long-term maintenance, or 'caretaker status' stage, would no longer be focused on keeping the facilities in a state of repair to facilitate rapid reuse. Rather, maintenance during this period would consist of activities intended primarily to ensure security, health, and safety and to avoid physical deterioration. Caretaker status would also include continuation of planned remediation activities. Active natural resource management activities will continue in accordance with federal law.

3.2.5 Encumbrances Applicable to Either Disposal Alternative

The Army's methodology for promoting environmentally sustainable redevelopment of BRAC disposal property includes identifying natural and man-made resources that should be protected after ownership transfers out of federal control. The Army develops this information from the environmental baseline information during the disposal process and provides it to the LRA with the recommendation that redevelopment considers protecting these valuable resources and any other conditions that might influence reuse. Using this methodology, the Army hopes to promote sustainable redevelopment and protection of valuable resources.

Use restrictions are legal constraints that may be imposed by deed on the non-reverting property to protect cultural resources, human health, or the environment. Other encumbrances can also arise on all of the property from the nature of the property or as a result of past use of the property. Examples of natural encumbrances include the tendency of some areas of the property to flood and the Mill Creek marsh to be considered wetland. The presence of hazardous building materials or conditions, such as asbestos-containing materials (ACM) and lead-based paint (LBP), are examples of legal encumbrances that might require specific management strategies. In most cases, these conditions will not materially or adversely affect redevelopment.

The Army's general policy is to impose use restrictions to protect specific resources only when required by a specific statute. For property transfers by deed (e.g., the non-reverting property) there will be a clause in the deed allowing the U.S. access to the property to take environmental remedial or corrective action (see 42 U.S.C. Section 9620(h)(3)(A)(iii)). Such a clause constitutes an encumbrance.

Use restrictions that the Army would consider include restrictions protecting and preserving cultural resources, restrictions to protect public health and safety and access to remediation sites. Encumbrances generally are not imposed for other facets of environmental protection and conservation, such as endangered species protection, CZMA, and wetlands protection, as these concerns are already regulated by local, state, and/or federal statutes and must be complied with regardless of property ownership. Furthermore, easements, rights-of-way, and leases may continue on portions of the land.

With respect to Fort Monroe, the encumbrances outlined in this section will only apply to non-reversionary property of the Army. Consistent with this methodology and as part of the disposal process, the Army will also meet all applicable requirements of federal law necessary to carry out agreements with regulatory agencies or to address specific Army needs.

Types of Encumbrances. Major categories of encumbrances, outlined below, can be identified on federal properties not subject to reversion.

- *Easements, rights-of-way, and other rights.* Real estate might be burdened with utility system, other infrastructure-related, roadway, or access easements, rights-of-way, and other rights (e.g., water rights and mineral rights).

- *Use restrictions*. Activities on property might be limited by existing conditions or in recognition of adjacent land uses. For example, use of a former landfill site would preclude ground disturbance of a clay cap but could permit passive uses such as recreation. The presence of munitions and explosives of concern (MEC) might preclude some uses of a parcel because of potential safety hazards. Use restrictions might also require that transferees of property take certain actions (e.g., remediate ACM or LBP prior to use of buildings for residential purposes) or refrain from certain actions (e.g., prohibit use of on-site groundwater pending completion of cleanup activities).

- *Historic building or archaeological site protection*. Negotiated terms of transfer or conveyance would result in requirements for new owners to maintain the status quo of historic buildings or archaeological sites or might impose a requirement for consultation with the State Historic Preservation Officer (SHPO) before any actions affecting such resources take place.

Encumbrances Identified at Fort Monroe. The following specific encumbrances would be expected to apply at the time of transfer or conveyance of the federal property not subject to reversion at Fort Monroe (the Commonwealth of Virginia will be informed of any perceived encumbrances on reversionary properties):

Land Use Restrictions. As a component of remedy implementation, the Army may restrict certain types of future land use, impose institutional controls, or take other actions affecting land use to protect human health and the environment. Such restrictions would be included in conveyance documents for property not subject to reversion.

Protection of Historic Properties and Cemeteries. Within Fort Monroe there are numerous historic structures. In 1960 the Secretary of the Interior declared Fort Monroe a NHL and in 1966 it was listed on the National Register of Historic Places (NRHP). The 189 contributing elements to the NRHP include 113 housing units, 2 support buildings, 60 administrative buildings, the stone fort, 3 support structures, 9 landscape features and 1 object, the Lincoln Gun. The Chamberlin, St Mary's Church and Rectory and the Old Point Comfort Lighthouse are contributing elements that are not owned or managed by the Army. Wherry Housing (31 buildings) are also contributing features to the NHL. Any adverse impacts to these buildings have already been mitigated through a Programmatic Comment approved by the ACHP on 31 May 2002. The Old Point Comfort Lighthouse and the Chamberlin are also individually listed on the NRHP. The Chamberlin, a privately owned property, was individually listed on the Virginia Landmarks Register in December 2006 and is protected by a separate agreement between the owners and the Commonwealth of Virginia.

The only cemetery known to have existed on Fort Monroe was the post cemetery, established prior to the Civil War. Its approximate location was east of the inactive airfield. Briefly designated a National Veterans Cemetery during the Civil War, it was used primarily to inter soldiers, nurses, and civilians who died at Fort Monroe's hospital or in battles in eastern Virginia during the period of the war in which Hampton Roads was too

heavily contested to safely transport the deceased to other cemeteries. Although no longer used as a Veterans Cemetery after the 1860s, the post cemetery continued to be used through the 1890s. Burials from this cemetery were relocated to the hometowns of the deceased or to the Hampton National Veterans Cemetery, beginning when the Civil War's hostilities moved out of the Hampton Roads area and continuing until the 1930s, when the Army wanted to reclaim the land as buildable acreage.

An investigation is currently underway to identify a potential African-American cemetery, known as the 'Freedman's Cemetery', which may be located at Fort Monroe. Based on archival research, no cemetery could be identified. However, if it existed it would have been used to inter the Contrabands (slaves claimed as the spoils of war for the purpose of being set free) and free Blacks who took refuge at Fort Monroe during the Civil War. Contraband was the term used by Brigadier General Benjamin Butler, commander of Fort Monroe at the outset of the American Civil War, to refer to slaves that had sought sanctuary there during the war. He had declared these people 'Contraband' and in doing so refused to return them to Confederate troops.

Given the severe constraints on suitable land at Fort Monroe and the period burial practices, it is likely that any possible African-American cemetery was either a section of the post cemetery or adjacent to the post cemetery. There is some potential that not all burials have been relocated, since wartime relocations, relocations occurring over an extended period of time, and non-archaeologist aided disinterments are likely to miss some human remains or associated funerary objects (further investigation is underway by the Army and will be reported separately from the EIS process). Cemeteries and graves, per se, are not ordinarily considered eligible for the NRHP unless they meet special conditions (Potter and Boland 1992), but are protected by other legislation (Virginia Antiquities Act, §10.1-2305 Code of Virginia), final regulations adopted by the Virginia Board of Historic Resources and published in the Register on 15 July 1991, and NAGPRA (25 U.S.C. 3001 and its implementing regulations, 36 CFR 10).

There is also a pet cemetery on Fort Monroe. The pet cemetery was started on the terreplein (the flat top of earthen berm behind the fort's stone walls) in the 1920s, although the earliest stone dates from the 1930s. This practice ended in the mid-1980s. The pet cemetery is now considered a contributing element in the Fort Monroe NHL.

Floodplains. Fort Monroe is located entirely within the 100-year floodplain. The majority of the post is described as an area of 100-year floods with flood levels ranging from 9 to 10 feet. The northeastern edge of the base is a little higher, with an elevation of about 13 feet, and is described as an area of 100-year coastal flood with velocity (when there is wave action). In 2009, a new seawall was completed along the Norfolk Harbor shoreline to replace the deteriorating seawall that was built in 1934 in response to the Great Hurricane of 1933. The new seawall is approximately 3,320 feet long and parallels the old wall. In addition to being much more resistant to wave attack, the height of the new seawall is nearly two feet higher than the old wall to provide greater protection to the property in the event of a storm.

In consideration of E.O. 11988, Army property conveyance documents will notify property transferees of their obligations to adhere to applicable restrictions on the property imposed by federal, state, or local floodplain regulations.

Munitions and Explosives of Concern (MEC). As a result of its history as the first Artillery School of Practice, the largest arsenal during the Civil War, and a practice ground for artillery troops, some excavations on the property have encountered munitions and, more commonly, munitions debris.

In 1995 an Ordnance and Explosive Waste Investigation identified many metallic anomalies across the fort (Parsons 1995). Very few were subsequently identified as munitions. In addition, the 2006 Historical Record Review indicates that there is the potential for MEC to remain at 4 Arsenal Area sites, 13 Fortress Area sites, and 23 Coastal Defense Area sites (Malcolm Pirnie 2006). This estimate was based on various sources of information, including an ordnance removal project performed by Navy explosive ordnance disposal in 1978.

The Army awarded a Remedial Investigation and Feasibility Study (RI/FS) in 2008 to determine the nature and extent of potential buried munitions at Fort Monroe as well as a course of action after closure. The geophysical and intrusive digging phase of this project were completed by late 2009. Approximately 2,300 metallic anomalies were identified as part of the geophysical investigation. These anomalies were intrusively investigated, and two MEC items were ultimately discovered. The remainder of the anomalies, included 7 pieces of scrap munitions debris and over 1,700 pounds of scrap metal trash. The final report is anticipated to be complete in late 2010.

Asbestos-containing Materials (ACM). Records indicate that ACM are present at Fort Monroe. All buildings constructed prior to 1987 located on Fort Monroe were inspected for the presence of ACM (Versar 1987, U.S. Army Corps of Engineers [USACE] 2003). Additional ACM surveys were conducted by Versar in 2003 on 28 buildings (Versar 2004a) and in 2004 on 27 buildings (Versar 2004b). Additional ACM surveys were conducted as needed for renovation and demolition projects. Although significant ACM surveys, testing, and abatement has occurred at Fort Monroe, not all remaining identified or suspected ACM was required to be abated. Prior to transfer or conveyance, the Army will remove, enclose, or encapsulate any discovered friable ACM posing a risk to human health, or negotiate agreements with the transferee to abate. The Army will provide notice in the transfer and conveyance documents for those buildings that are known or suspected to contain ACM.

Lead Hazards. Fort Monroe has managed all lead hazards (including LBP and lead in drinking water) in accordance with its Lead Hazard Management Plan (1999), including, but not limited to, informing occupants of the possible or known presence of LBP, testing paint before maintenance projects, incorporating lead abatement into renovation projects, and keeping a mulch cover over the ground along the dripline of residences. Almost every building on Fort Monroe built prior to 1978 contains or contained LBP at some time in its history. However, lead was abated through removal or enclosure in the majority of the

quarters during renovations in the late 1990s and early 2000s, and many administrative buildings have been partially or completely abated as well. The DPW Environmental Division maintains a database of lead testing data collected for specific projects, as well as information on what has been abated on specific buildings. The data include analytical results of sampling paint chips, dust, soil, and drinking water. Consistent with the Residential Lead-Based Paint Hazard Reduction Act of 1992 (Pub. L. 102-550), the Army will provide notice in transfer and conveyance documents that buildings containing LBP would be restricted from residential use unless the recipient of the property abates LBP hazards.

3.3 REUSE ALTERNATIVES

Depending on numerous factors, including information presented in this EIS, disposal might occur as a single event involving transfer of all surplus property (i.e., property that will not revert back to the Commonwealth of Virginia) within the facility to one or more subsequent owners, or it might occur over time with multiple transactions involving the same or several new owners. Regardless of the method of disposal, timing, or identity of new owners, reuse of Fort Monroe is reasonably foreseeable. Consistent with statutory requirements, this EIS analyzes the impacts of closing Fort Monroe and disposing and reusing installation non-reverting property. Reuse of non-reverting property is treated as a secondary action resulting from closure.

The FMA proposal involves primarily land that reverts to the Commonwealth of Virginia, and to a lesser extent, federally owned land that will be disposed as well. CEQ regulations require evaluation of reasonably foreseeable actions, without limitation on the party conducting them, and evaluation of consequent environmental impacts. Furthermore, reuse of both surplus property and the cumulative impacts of reusing reverting property will be evaluated in this EIS.

The following subsections discuss the methodology used to define the reuse scenarios to be considered. The Army considers the Reuse Plan for Fort Monroe the primary factor in defining the reuse scenarios to be considered and evaluates the Reuse Plan for potential environmental effects.

3.3.1 Development of Reuse Alternatives

The reuse planning process is dynamic and often dependent on market and general economic conditions beyond the control of the reuse planning authority. In recognition of the complexities attending reuse planning, the Army uses intensity-based probable reuse scenarios to identify the range of reasonable reuse alternatives required by NEPA and by DoD implementing directives. That is, instead of speculatively predicting exactly what will occur at a site, the Army establishes ranges or levels of activity that reasonably might occur. These levels of activity, referred to as intensities, provide a flexible framework capable of reflecting the different kinds of uses that could result at a location. Reuse intensity levels also take into account the effects that encumbrances exert on reuse.

3.3.2 Reuse Intensity Categories Described

Five intensity-based levels of reuse can be evaluated for their potential environmental and socioeconomic impacts as outlined in *Base Realignment and Closure Manual for Compliance with the National Environmental Policy Act* (USACE 2006). These are low intensity reuse (LIR), medium-low intensity reuse (MLIR), medium intensity reuse (MIR), medium-high intensity reuse (MHIR), and high intensity reuse (HIR). At any given installation, however, analysis of all five levels of intensity might not be appropriate due to historical usage, physical limitations, or other compelling factors.

Levels of reuse intensity can be viewed as a continuum. In the context of Fort Monroe, an MIR reuse scenario might be represented by conversion or replacement of existing modern era and noneligible older structures, while at the same time renovating and/or replacing base housing for full occupancy; accommodating recreational and tourism use of natural areas, beaches, marina, and buffer areas; and providing for conservation and tourism of historical areas.

Indicators of levels of intensity can be quantified by counting the number of people at a location (employees or residents), the potential number of vehicle trips generated as a result of the nature of the activity, or the number of dwelling units. Other indicators of the intensity of use are the rates of resource consumption (electricity, natural gas, water) and the amount of building floor space per acre (identified as the floor area ratio [FAR], expressed as the amount of square feet (SF) of built space per acre).

Development of intensity parameters is based on several sources, including existing land use plans for various types of projects and planning jurisdictions, land use planning reference materials, and prior Army BRAC land use planning experience (USACE 2006). Private sector reuse of property subject to BRAC action, on the other hand, seeks different objectives and uses somewhat different planning concepts in that it focuses on creation of jobs and capital investment costs, and it typically uses traditional community zoning categories (e.g., residential, industrial).

Upon evaluation of various types of indicators in light of their applicability to Army lands subject to BRAC action, the Army has selected four representative illustrative intensity parameters. These are residential density, employee density (general spaces), employee density (warehouse spaces), and FAR (USACE 2006). These intensity parameters aid in evaluation of environmental effects at various levels of reuse (see Table 3.3-1).

Land used intensity parameters used in Table 3.3-1 are defined as follows:

- *Residential density*. This parameter identifies the number of dwelling units per acre. It also provides an indication of the number of people who might reside within that land use area.

- *Square feet per employee (general space)*. This parameter indicates the number of SF available per employee in all types of facilities at an installation except family housing and warehouses or storage structures.

- *Square feet per employee (warehouse and storage space)*. This parameter indicates the number of SF available per employee engaged in warehouse or storage activities at an installation. Only built, fully enclosed, and covered storage space is calculated; sheds or open storage areas are excluded from computation. In describing uses of facilities, estimates of the number of employees engaged in warehouse or storage operations are used to determine the portion of the installation workforce in this employee density category.

- *Floor area ratio (FAR).* This ratio reflects how much building development occurs at a site or across an area. For example, a three-story building having a 7,500 SF footprint on a 4 acre site would represent a FAR of 0.13 in the medium intensity range (22,500 SF of floor space within a 174,240 SF property).

Table 3.3-1 Reuse Intensity Parameters

Intensity Level	Residential Density	SF per Employee (General Space)	SF per Employee (Warehouse Space)	Floor Area Ratio (FAR)
Low	<2	>800	>15,000	<0.05
Medium-Low	2-<6	601-800	8,001-15,000	0.05-<0.10
Medium	6-<12	401-600	4,001-8,000	0.10-<0.30
Medium-High	12-<20	200-400	1,000-4,000	0.30-<0.70
High	>=20	<200	<1,000	>=0.70

* Parameters are defined in the discussion below. Shaded area represents current land use intensity levels that correlate directly with Fort Monroe.
Source: USACE 2006

Employee density, FAR, and residential density shown in Table 3.3-1 are appropriate to describe intensity levels for reuse planning at Fort Monroe. The intensity parameters shown in Table 3.3-1 reflect generalized values or ranges appropriate to describe the variety of installations subject to Army management, as well as the variety of reuse situations. The intensity parameters should be considered together in evaluating the intensity of reuse of a site so as to provide full context. Use of any single parameter in isolation might unduly emphasize certain aspects of a site or preclude broader consideration when classifying a reuse scenario into one of the five intensity levels presented in Table 3.3-1. As these metrics are scale-dependent, average metrics are typically used for the entire installation for the purposes of classifying current and potential future reuse scenarios for a closing installation. These metrics are principally used for the purpose of developing a conceptual framework for bracketing and defining the intensity of reuse for a site based on current conditions and reuse concepts developed and presented as part of the Reuse Plan. The details presented in the Reuse Plan for specific areas and more detailed resource-specific metrics, models, and analyses, are used to estimate effects in Section 4.0 (as further discussed for each resource in Section 4.0).

3.3.3 Baseline Reuse Intensity

Present use of Fort Monroe remains near to what it was at the time of the BRAC closure announcement, which is characterized as medium intensity based on FAR and SF per

employee metrics (see Table 3.3-1) (*Note: The residential density metric is not used for characterizing baseline conditions at Fort Monroe because residential use is not a major component of current use. However, residential density will be used for evaluating future reuse, as further discussed in Section 3.3.4*.) The total floor area of all buildings is approximately 1.7 million SF over 365 acres of buildable land, resulting in an FAR of 0.11, which narrowly represents a medium intensity use. Employee density in general space is just below 500 SF per employee, which is also a medium intensity value. The ranges in which these values fall are shaded in Table 3.3-1 for ease of reference. Table 3.3-2 is an accounting of land use acreages by category for the entire installation.

Table 3.3-2 Land Use Summary, Fort Monroe, Virginia

Land Use Category	Acres	Percent of Total
Administrative	25	4
Airfield	100	18
Ammunition Storage	9	2
Community Facilities	21	4
Family Housing	72	12
Troop Housing	4	1
Industrial/Service	57	10
Moat	20	4
Parade Grounds	10	2
Recreation	144	25
Other Areas	103	18
TOTAL	565	100
Adapted from Fort Monroe Environmental Master Plan (J.M. Waller Associates 2005)		

3.3.4 Local Reuse Plan

The Reuse Plan, as approved by Commonwealth of Virginia Governor Kaine on 20 August 2008 is provided in Appendix B. The Reuse Plan describes the five Fort Monroe Planning Essentials that were developed with public involvement:

1) *Protect this historic place and keep it vital;*

2) *Open it up;*

3) *Establish a large-scale open space park;*

4) *Seek economic sustainability; and*

5) Allow new development, within strict limits.

The Reuse Plan presents concepts and limits for future use within each of the land management zones. An excerpt from the Executive Summary of the Reuse Plan (FMFADA 2008) which summarizes the reuse concepts for each of the land management zones is provided below.

*"**Inner Fort.** This area will require the strictest standard of preservation and protection. The Reuse Plan proposes no new development inside the stone fort; the existing buildings will be maintained and can be reused for a variety of purposes, including historic interpretation purposes, museums, meeting spaces, offices, lodging, and residences. The adaptive reuse of buildings will explore the unique opportunities presented for preservation, restoration, and rehabilitation and will look foremost to supporting the interpretation of the Fort as a historic site and enhancing cultural tourism.*

***Historic Village.** This area has the largest concentration of historic buildings and includes a diversity of building types and ages. The goal is to create a complete mix of uses similar to those found in other historic towns and villages in the Tidewater region, and should include workplaces, shops, residences, lodging, and civic institutional uses. Historic buildings will be protected and reused. Selective infill development will be allowed on a very limited basis.*

***Entry Gate.** This area is the primary entrance to Fort Monroe, located within the Historic Village management zone. Today, the existing circulation pattern is geared toward security, with one entrance to and from the Fort. It is recommended that this intersection be reconfigured to allow more than one option for entering and exiting. The reconfiguration should respect the historic character, preserve the alignments of bridges and street where possible, and combine historic structures together with new civic spaces and buildings to create a memorable, functional entry.*

***North Gate.** The North Gate area spans north from the moat to Mill Creek; today, this area includes storage warehouses, surface parking lots, and garages. This area will most likely be used for new construction that integrates seamlessly with contributing historic structures and creates good addresses within a walkable urban framework. Pedestrian connections should be incorporated throughout, including sidewalks along all streets, crosswalks leading to key destinations, and a public trail along Mill Creek.*

***Wherry Quarter.** The Wherry Quarter is the area northeast of the moat. It contains warehouse and service/utility structures, surface parking, some areas of vacant space, and the Wherry housing units along the bayfront. The eventual land use and physical design of the majority of this zone is to be determined at a future date, after additional studies are completed. By focusing first on the reuse of existing buildings and selective infill development in other areas of the Fort, there will be ample time to make informed final decisions for this area.*

> ***Parks and Recreation Areas.*** *The Parks and Recreation Area is divided into two sub areas; Parks and Recreation Area 1 is an area devoted to open space uses, including public beaches, preserved natural areas, recreation fields, and walking trails. Parks and Recreation Area 2 (part of the Wherry Quarter management zone) features open lands, existing buildings, several batteries, and areas where buildings were once located. The batteries are contributing historic structures to be preserved and potentially reused. Existing non-contributing buildings, such as the Bay Breeze Community Center, can remain or be redeveloped. New construction will be limited, conform to the same general geographic area as previous development, and support the adjacent open space uses." (FMFADA 2008)*

Each of the planning essentials and management zones is discussed in detail in the Reuse Plan. The Executive Summary and relevant figures depicting concepts of the Reuse Plan are presented in Appendix B and Figure 3.3-1.

The Executive Summary of the Reuse Plan discusses, on pages 5-7, the NPS's reconnaissance study on making Fort Monroe a national park. The study concluded that while the resources of Fort Monroe are likely to meet the criteria for national significance and suitability as a national park should a Special Resource Study be authorized by congress, it would be unlikely that all of Fort Monroe would be feasible for NPS designation. The study also concluded that even the stone fort itself would require a strong and financially sustainable partner for long-term viability as a NPS unit. The NPS proposed to offer technical assistance in devising plans for the historic preservation of the fort's resources and development of a master plan to promote public understanding and appreciation of Fort Monroe. The NPS also found that current and anticipated NPS budget constraints make it "unlikely" that the historic fort itself (the area inside the moat) would be feasible for inclusion in the NPS without strong, substantial financial support to manage, maintain, and operate it. As such, the Reuse Plan signed by the Governor does not include a NPS unit.

Subsequent to the issuance of the signed Reuse Plan, the FMFADA board voted on 19 November 2009 to request that a portion of Fort Monroe be managed as a NPS unit, with ownership of the land retained by the Commonwealth of Virginia (FMFADA 2010). The specific area proposed by the FMA includes "Old Quarters #1, the stone fort structure and moat, the outer works of the fort, Batteries Parrott and Irwin (Endicott-era coastal batteries), and the radar station on the fort's parapet" (FMFADA 2010). Regardless of the final outcome of this initiative the management of the proposed area, as outlined in the Reuse Plan, will be governed by the PA, prepared in consultation with and signed by the NPS (see Appendix F).

3.3.5 Alternatives Evaluated in Detail

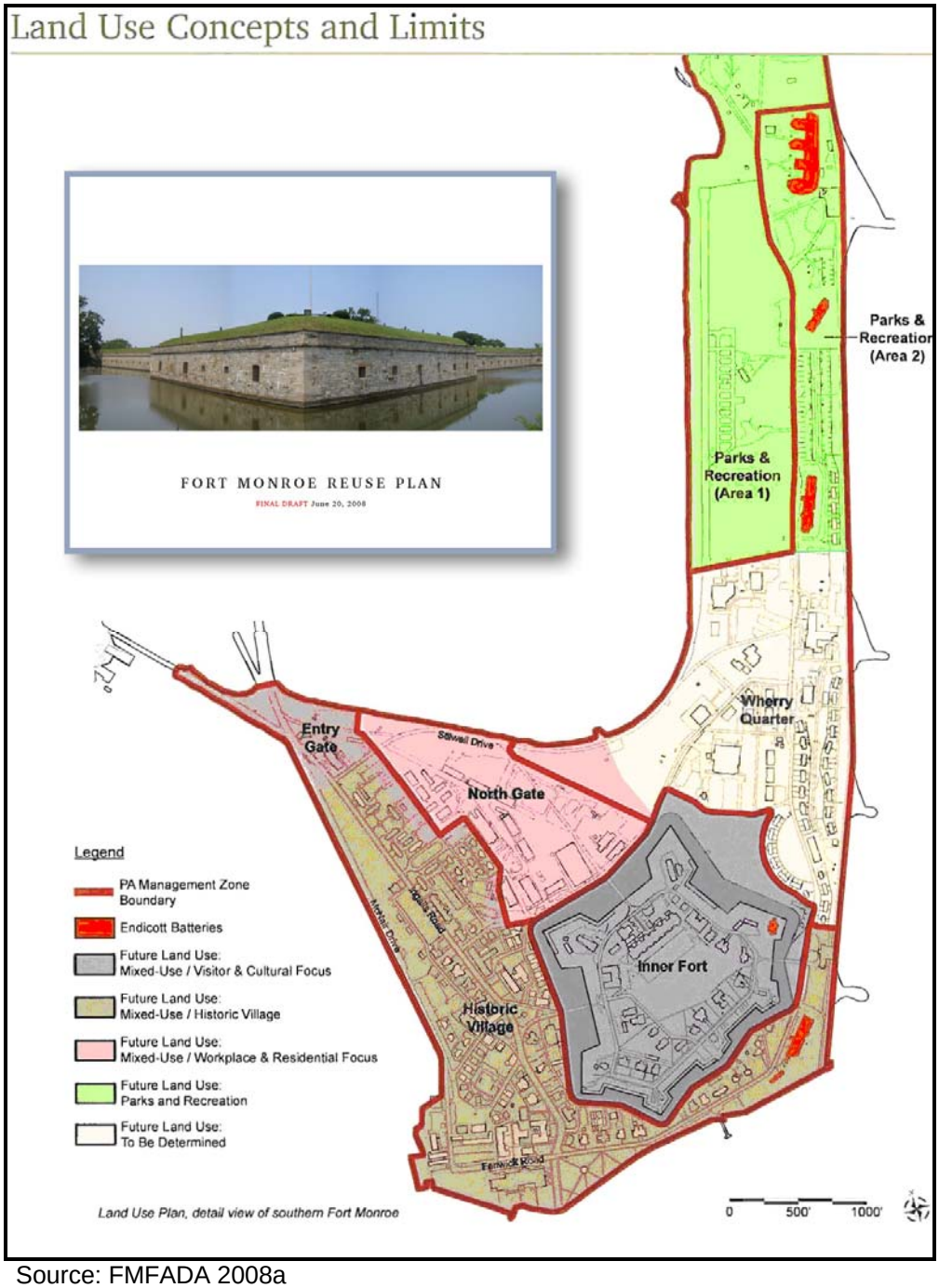
With five distinct land management zones to consider, the FMA is focusing reuse of Fort Monroe on multiple land-use options and financial resources. The Reuse Plan states that "a mix of land uses and building types is important not just for the social culture of any community, but for economic reasons as well. An enduring settlement contains not just houses or workplaces, but a mix of uses that are adaptable for change over time. A

variety of uses within a neighborhood, including commercial businesses, creates the ability to live, work, shop and find other services within walking distance. Encouraging a balance of people living and working on Fort Monroe provides multiple benefits, including fewer daily trips that rely on the regional road network, increased support for local businesses, and new and historic housing options to accommodate a diverse population."

The Reuse Plan proposes various land uses within each zone and allows for flexibility for the full potential of each to be reached in stages beginning with reuse of existing structures; continues with selective infill, reclamation of underutilized land, careful realignment of circulation patterns, and establishment of a large-scale open space to the north; and lastly, proposes redevelopment of areas for which a consensus regarding future use has not yet been determined. All land use zones will be open to the general public. No gated communities are proposed.

The end state of redevelopment and reuse will be refined gradually over time as the balance between preservation, development, and economic viability is fine-tuned. Ultimately it will depend on long-term market conditions tempered by the five planning essentials. Also protecting Fort Monroe are federal and state laws, covenants, and the enforceable programs of the Commonwealth of Virginia. Based on the Reuse Plan and supporting studies, reuse should be at, or less than, the medium intensity level. More intensive reuse scenarios contemplated in early reuse planning efforts (e.g., Scenarios IIIA and IIIB from the 2006 reuse planning effort), that are commensurate with a medium-high intensity of redevelopment, were not selected as part of the final Reuse Plan and are not considered reasonably foreseeable for Fort Monroe. Therefore, this document will not analyze any level of reuse higher than medium intensity.

To bracket potential reuse of Fort Monroe, three separate levels of intensity will be analyzed, including a Lower Bracket, Middle Bracket, and Upper Bracket. The Middle Bracket is considered to be commensurate with long-term build-out of the Reuse Plan. The Lower Bracket and Upper Bracket provide ranges of intensity meant to bound reasonable long-term redevelopment of Fort Monroe. Given that most of the structures at Fort Monroe will remain, the development intensity as measured by the FAR metric for all three scenarios ranges from the low- to the high-end of the medium intensity category (i.e., just above 0.1 to nearly 0.3, as shown in Table 3.3-1).



Source: FMFADA 2008a

Figure 3.3-1 Fort Monroe Reuse Concepts

Reuse intensity for the Lower Bracket, Middle Bracket, and Upper Bracket scenarios are generally described using the metrics presented in Table 3.3-3. These metrics serve as a point of departure for estimating resource-specific metrics and inputs for various models and analyses for estimating resource-specific effects in Section 4.0. For example, residential unit density metrics and non-residential square footage development metrics from Table 3.3-3 are key input parameters required for simulating vehicular trips and traffic generation, as further discussed in Section 4.11. Traffic generation is then used to estimate noise and air emissions, along with estimates of land use and population change (derived in part from residential unit metrics and redevelopment plans). The residential unit density metrics and total employment metrics presented in Table 3.3-3 are important input parameters for modeling socioeconomic changes, as well as for assessing changes in water consumptions patterns and wastewater generation. In addition, the Reuse Plan provided conceptual renderings and detailed maps depicting localized changes in building footprints versus renovations, modifications to parking lots and impervious surface (e.g., airstrip), as well as plans for expanded road networks and coastal development. Analysis of these redevelopment maps and baseline aerial photography allowed for estimation of changes in impervious surface, estimates of ground disturbance, natural habitat disturbance, and loss of green space. Furthermore, landscape artistic renderings of viewsheds presented in the Reuse Plan for the lower fort area were also utilized for assessing changes in the aesthetic character of Fort Monroe, in addition to other land use metrics.

A description of the five management zones for each of the three intensity levels that bracket the Reuse Plan is presented below.

Table 3.3-3 Reuse Scenarios Evaluated in Detail

Intensity Level	Residential/ Lodging Units	Employees	SF per Employee (General)	Non-Residential Development (square feet)	FAR (mid-point)*
Lower Bracket Scenario	250	400	600	200,000	0.11
Middle Bracket Scenario	1,300	2,000	500	1,000,000	0.25
Upper Bracket Scenario	1,500	3,000	401	1,200,000	0.28

* The FAR metric represents a conservative estimate of the combined building square footage for all structures on 365 acres of buildable space. For the Lower Bracket scenario, only existing structures will be renovated and reused. The FAR for the Lower Bracket scenario is commensurate with current conditions. For the Middle and Upper Bracket scenarios, most residential redevelopment will involve infilling and expansion (90 percent), while most of the commercial/office construction will involve renovation of existing structures (~900,000 square feet).

Lower Bracket Scenario. The Lower Bracket scenario would be commensurate with current baseline conditions with respect to building intensity, but with the added effect of a recreational tourism destination (e.g., beaches, open space, military museums, historic structures, lodging accommodations, and amenities). At this intensity there would be minimal disturbance, but also limited economic resources for long-term self-sustainment, relative to the other scenarios. For this scenario, there would be substantially lower

employment opportunities and residential populations than are now on site (about one-third of the current on-site population when considering the large reduction in employment, with some increased tourism [see Section 4.11 for the discussion of tourism estimates]), with some lodging and associated amenity requirements due to anticipated tourism. Up to 250 residential units would be used exclusively for lodging accommodations for tourism or both tourism and limited residential use. Residential units would be created from renovation of existing structures, principally in the Historic Village, Entry Gate, and North Gate areas. Existing structures will also be renovated to support non-residential use (up to 200,000 SF of commercial and retail space). Unused structures will be maintained in accordance with the terms of the PA. Development intensity would be commensurate with current baseline conditions relative to existing structures, with little to no demolition. Summary metrics that define the Lower Bracket scenario are presented in Table 3.3-3.

Components of the Reuse Plan that are considered commensurate with the Lower Bracket scenario are presented below.

INNER FORT: Adaptive reuse of buildings for a variety of purposes, including historic interpretation, museums, meeting spaces, lodging, and limited residences.

HISTORIC VILLAGE AND ENTRY GATE: Historic buildings reused and renovated to accommodate a range of alternative uses including limited retail, commercial, and lodging amenities to support tourism, but virtually no expansion of building footprints and no expansion of the marina area.

NORTH GATE: Historic buildings reused and renovated to accommodate a variety of new uses including limited retail, commercial, and lodging amenities to support tourism; neighborhood parks created; and enhanced accessibility to waterfront at Mill Creek.

WHERRY QUARTER: Public park and recreation areas added. Existing structures would remain in place and principally unused.

PARKS AND RECREATION AREAS: Nature center and walking trails created; an outdoor amphitheater and visitor parking areas constructed; and adaptive reuse of batteries implemented.

Middle Bracket Scenario. The Middle Bracket scenario would be commensurate with reasonable long-term and successful execution of the Reuse Plan. Although there would be infill and expanded development under this scenario, principally for residential and lodging construction, the intensity of reuse would still be commensurate with a MIR scenario with a FAR of 0.25 (based on combining existing structures, new office/retail/commercial structures, and new residential development). Residential density in the lower fort area will be approximately 6 units/acre after full build-out. The vast majority (~90 percent) of the residential units will be created through infilling and new building structures, while a smaller portion (~10 percent) will be created from renovation of existing structures. Virtually all of the residential units will be created in the Historic

Village, Entry Gate, and North Gate areas. Office space would be created by renovation of existing buildings, which offer 516,622 SF, as well as some expansion and infill development (~500,000 SF). Large buildings account for most of the square footage, but within that figure are small office buildings that can be renovated to attract business professionals. The Reuse Plan does consider the possibility that large tenants may want to construct facilities on Fort Monroe. Furthermore, such development may be encouraged by an "extensive recruitment plan." Summary metrics that define the Middle Bracket scenario are presented in Table 3.3-3.

Components of the Reuse Plan that are considered commensurate with the Middle Bracket scenario are presented below.

INNER FORT: Full occupancy of buildings for uses such as a maritime research center or oceanographic institute, a college campus, a specialized research center, conference center, and/or national headquarters for a nonprofit organization.

HISTORIC VILLAGE AND ENTRY GATE: Selective infill development constrained by a minimum-maximum height requirement of 2-3.5 stories; and marina expansion – new slips and new facilities (assumed to be 4 new docks with an increased capacity of up to 80 more boats).

NORTH GATE: New workplace and residential buildings meeting the 2-3.5 story height restriction seamlessly integrated among the contributing historic structures.

WHERRY QUARTER: Limited workplaces established through refurbishment and new construction; and limited residential housing created through renovation and new construction. The majority of existing structures would remain in place and principally unused (expansion and redevelopment of this area is mainly associated with the Upper Bracket scenario).

PARKS AND RECREATION AREAS: Northern connection between Fort Monroe and Buckroe areas (alignment undetermined); and beach nourishment along the Chesapeake Bay shoreline.

Upper Bracket Scenario. The Upper Bracket scenario would be slightly more intense than the proposed reuse, but still within a medium intensity of reuse (FAR of less than 0.3 when combining existing structures, new office/retail/commercial structures, and new residential development). Office space would be created by renovation of existing buildings, which offer 516,622 SF, as well as additional expansion and infill development. The Reuse Plan provides no data on size or square footage of such new construction, but significantly higher space would have to be occupied before the plan would spill over into the realm of an Upper Bracket reuse scenario. Expansion of the marina would be greater than in the Middle Bracket scenario (up to a 30 percent increase from existing conditions for the construction of up to 5 docks for up to 100 additional boats). Summary metrics that define the Upper Bracket scenario are presented in Table 3.3-3. In addition to the increase in residential and non-residential development, additional marina expansion is assumed with 5 new docks with an increased capacity of up to 100 more boats.

Although the intensity of development will be higher for the Upper Bracket scenario, the type of development described above for the Middle Bracket is assumed to be the same for each of the zones, with the exception of the Wherry Quarter. Overall, the Upper Bracket is commensurate with the Reuse Plan with added development in the Wherry Quarter and other areas, which reflects approximately a 20 percent increase in development intensity over the Middle Bracket scenario. The increase in residential units (200 units) and non-residential square footage (200,000 SF) from the Middle Bracket to Upper Bracket scenario is assumed to occur principally within the Wherry Quarter area. It is further assumed that most of these structures will consist of new construction, with demolition of most existing structures (e.g., replacement of the existing Wherry housing residential units). Residential density in the lower fort area, which would be a mix of new construction and less than 10 percent renovation, will be approximately 7 units/acre at full build-out. Thus, the Upper Bracket represents a reasonable upper-bound of full build-out of Fort Monroe envisioned in the Reuse Plan, while the Middle Bracket represents the most-likely full build-out scenario with limited changes to the Wherry Quarter. It should be noted that this small adjustment in development intensity is relatively minor with respect to most resources areas analyzed in this EIS.

3.3.6 Reuse Alternatives Not Evaluated in Detail

Medium-High Intensity Reuse (MHIR). Reuse of the Fort Monroe site to a MHIR level would involve the creation of over 6.0 million SF of additional space. This would increase total space to slightly over 8.0 million SF, or nearly five times greater than present conditions. With Fort Monroe's status as a NHL District, planning for reuse at a higher intensity than Fort Monroe's current level of activity is unrealistic, given the significant complexity and expense of meeting federal, state, and local regulatory requirements for historic properties. In addition, more intense reuse scenarios considered during early reuse planning that were just slightly above a medium intensity based on the FAR (approximately 0.35 for Scenarios IIIA and IIIB, which is within the range of a MHIR scenario) were not selected for the final Reuse Plan. Therefore, they were not considered reasonably foreseeable and were not considered in this EIS. Thus, the MHIR scenario is not considered further in this EIS.

High Intensity Reuse (HIR). For the reasons stated under MHIR, the even higher levels of development that would occur under a HIR scenario are not considered reasonable. Therefore the HIR scenario is not considered further in this EIS.

Medium-Low Intensity Reuse (MLIR). Reuse of Fort Monroe at a MLIR would require increased demolition of some existing structures in order to achieve more open space and lower development density than baseline conditions. With Fort Monroe's status as an NHL District, and the need to generate a revenue base to maintain these historic structures, planning for reuse at a lower intensity than Fort Monroe's current level of activity is not viable. Furthermore, creation of open space and demolition of structures to achieve an MLIR intensity scenario would be precluded given the site's NHL District status. Therefore, the MLIR scenario is not considered further in this EIS.

Low Intensity Reuse (LIR). For the reasons stated above, creation of even more open space and demolition of additional structures that would be necessary to achieve an LIR scenario are not considered reasonable. Therefore, the LIR scenario is not considered further in this EIS.

National Park Service Alternative. Many commenters expressed support for a national park on the Fort Monroe property and its evaluation as an alternative in the EIS. The Army recognizes the strong support for a national park expressed by many in the community and the recent NPS initiatives taken by the FMA (2010). The Army considered a national park alternative for analysis in the DEIS, but for the following reasons declined to include it as a separate alternative, either the conversion of Fort Monroe into a national park or the establishment of a national park unit on a portion of Fort Monroe.

Conversion of Fort Monroe to a National Park. The CEQ and Army regulations and guidance require that an EIS discuss a "reasonable range of alternatives" depending upon the facts and nature of the proposal, including alternatives outside the jurisdiction of the federal agency if these are reasonable ways to achieve the purpose of and need for the action. For Fort Monroe, the two purposes for the federal action (as directed by the 2005 Base Closure Law) are disposing of the non-reverting property and making it available for reuse.

Consistent with the BRAC Law and with considerable public participation, the FMFADA prepared a comprehensive and detailed redevelopment plan with the objective of establishing a mixed-use community on Fort Monroe. During the public participation process, many members of the public instead favored establishing a national park on Fort Monroe. Responding to her constituent's concerns, Rep. Thelma Drake asked the NPS to conduct a Reconnaissance Study to determine if Fort Monroe should be evaluated for inclusion in the National Park System. The survey process included a 6 December 2007 public meeting held by the NPS. The study concluded the following:

> *"It is "unlikely" that the entire 570-acre Fort Monroe property would qualify for inclusion in the National Park System. The NPS also finds that, given current and anticipated NPS budget constraints, the historic Fort itself (the area inside moat) "unlikely" would be feasible for inclusion in the National Park System without strong, sustainable financial support to manage, maintain, and operate the historic Fort and grounds"* (Reconnaissance Study, pg 2 [U.S. DOI 2008]).

The FMFADA considered the study, accepted the NPS offer of general technical assistance, and stated it would explore ways the FMFADA and NPS could partner in the future (FMFADA 2008). This effort continues to this day, and may result in technical and interpretive assistance from the NPS. However, the Reuse Plan signed by Governor Kaine in August of 2008 does not include a national park or NPS partnership.

It is recognized and discussed in the following section that the Commonwealth and the FMFADA have collectively sought an affiliation with the NPS with the stipulation that the

Fort Monroe property will remain under Commonwealth ownership. The affiliation approach is embodied in the 2007 Act establishing the FMFADA and in the 18 May 2007 Memorandum of Agreement (MOA) between the FMFADA and the Commonwealth. Because the Commonwealth owns the vast majority of the historical and cultural resources on Fort Monroe, the absence of a national park as part of the Reuse Plan is a significant impediment preventing its selection as a reasonable alternative for detailed analysis. It is therefore not appropriate to consider conversion of Fort Monroe into a national park as an alternative in this EIS.

Establishment of an affiliation with the National Park Service (NPS) on a portion of Fort Monroe. Although the FMA has been mandated from its very inception and continues today to explore management of Fort Monroe's historic resources through an affiliation with the NPS, such an affiliation is not included in the Reuse Plan. The Reuse Plan signed by the Governor outlines the agreed upon management role of NPS, which includes providing support to the FMA, such as technical, interpretative, and other assistance. This type of support is already included as part of the reuse alternatives selected for detailed analysis in this EIS, as discussed in Section 3.3.5. The Army does not believe the provision of technical, interpretive, or other assistance results in an alternative different from those evaluated in this EIS.

Subsequent to the signing of the Reuse Plan, the FMFADA voted to initiate a course of action on 19 November 2009 to request that a portion of Fort Monroe be managed as a NPS unit, with ownership of the land retained by the Commonwealth of Virginia (FMFADA 2010). Regardless of the final outcome of FMFADA's request, the cultural resources and historic properties of Fort Monroe will be reused and managed in accordance with the PA. A recent FMFADA solicitation (Request For Proposal #: FMFADA-906-66-05-19-2009) clearly states their intent "to contract for professional planning services to coordinate Long Range Interpretive Master Planning, in accordance with the model standards adopted by the National Park Service".

When the Army vacates the property, there will be non-DoD personnel and resources dedicated to the management of cultural resources at Fort Monroe in accordance with NPS standards and the requirements of the PA. The uniform and affiliation of the dedicated staff; be they from NPS, the Commonwealth, FMA, conservation volunteers, or a mixture, will not impact the way in which the historic resources are conserved and managed. Therefore, the effect on historic properties will be identical regardless of whether the management responsibility lies with the NPS, the Commonwealth of Virginia, the FMA, or any other entity or entities. The equivalency of these different management resources is recognized by NPS Special Resource Studies under the "Need for NPS management" criterion. In fact, the NPS concluded that "All of [Fort Monroe's] resources could be adequately protected and administered by the Commonwealth, with public access and interpretation provided through state park designation, or through a well-conceived, comprehensive public/private preservation, public education and reuse venture" (U.S. DOI 2008).

The Army concludes that the same impacts will result whether the historical resources are managed by the NPS or by some other qualified cadre of personnel. Therefore, the analysis of a separate and distinct NPS affiliation or partnership alternative is not considered necessary, as this would be duplicative of the reuse alternatives already selected for detailed analysis in this EIS.

4.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

4.1 INTRODUCTION

This section describes the current environmental conditions of the resource areas that would be affected by implementation of the proposed action and alternatives, and the potential effects that would arise. Descriptions of the affected environment represent baseline conditions, or the "as is" conditions, at the installation. The baseline for this document has been established as status quo environmental conditions in November 2005, the time that the BRAC Commission's recommendations became final. This baseline is used to compare any changes that would result from closure, disposal, and reuse actions. Direct, indirect, and cumulative effects of the proposed action are addressed.

The environmental consequences associated with each alternative follow the discussion of the affected environment for each resource. The discussion of environmental consequences is divided into five sections for each of the alternatives evaluated in the EIS: early transfer, traditional disposal, caretaker status, no action, and reuse. Reuse is further divided into effects associated with the Lower Bracket, Middle Bracket, and Upper Bracket scenarios. As discussed in Sections 2.0 and 3.0, these reuse scenarios sufficiently bound the degree of redevelopment that may occur in the foreseeable future.

For each of the three reuse scenarios, the direct, indirect, and cumulative effects of the proposed action are addressed. These effects are characterized as either adverse or beneficial and as minor, moderate, or significant. As defined by CEQ 40 CFR, Section 1508, direct effects are those caused by the actions that occur during the same time and place. Indirect effects are caused by the action but occur later in time, or are further removed from the proximity of the action, but are still reasonably foreseeable. Significance of effects is determined for each resource area in terms of both context at Fort Monroe and the intensity of the impact. A minor effect is a slight impact that is detectable but too small to measure and that may be naturally restored or easily minimized. A moderate effect is an impact that is readily apparent and may not be naturally restorable, typically more amenable to quantification, such as the volume of wastewater discharged to a local sewer, but is below a level of significance. Cumulative effects and identification of mitigation measures are discussed at the end of this section, in Sections 4.14 and 4.15, respectively.

The baseline conditions are described in the Affected Environment section for each resource. In general, baseline conditions are described as status quo conditions in keeping with full Army utilization of Fort Monroe at the time of November 2005. Army BRAC decision in accordance with U.S. Army guidance and CEQ regulations (i.e., USACE [2006] and 40 CFR Part 1500). Baseline conditions are not defined as pristine environmental conditions, nor future potential conditions. Future environmental conditions that may occur as a result of each alternative are then compared to the same baseline condition in order to characterize effects and facilitate a meaningful comparison of alternatives. Beneficial or adverse effects are then estimated relative to the condition expected of the resource under continuation of Army ownership (e.g., environmental management was assumed to continue as is under no action).

The effects of disposal are not simply the execution of legal documents. Specifically, as ownership passes from the federal government to non-federal entities, whether they are public or private, there are implications that will follow due to changes in applicable policies, regulatory schemes, management regimes, and goals that are linked to future development of the property at issue. Given that the final decisions with respect to reuse are beyond the control of the Army, the reuse scenarios represented in the Reuse Plan are examined in the context of intensity characterizations previously discussed (i.e., Middle Bracket). In this manner, the EIS seeks to capture and analyze the potential short-term and long-term implications of property disposal and reuse. The reuse scenarios evaluated in the sections to follow sufficiently encompass the degree of redevelopment in the Reuse Plan.

4.2 LAND USE

4.2.1 Affected Environment

4.2.1.1 Regional Geographic Setting and Location

Fort Monroe is a 565-acre Army installation located on the Atlantic coast in southeastern Virginia in the Hampton Roads region. The post completely occupies a large sand spit (2.6 miles in length) off the southeastern coastline of Hampton, Virginia, known as Old Point Comfort and is bounded by the Chesapeake Bay to the east, Mill Creek to the west, and the Port of Hampton Roads to the south.

4.2.1.2 Installation Land Use/Airspace Use

Fort Monroe is primarily an administrative post, with few physical training activities when compared to other Army posts. The densest concentration of human activity on the installation takes place at the southern end within the cantonment area where the administration, housing, and other services are located.

The Wherry Quarter is considered a transition area between the highly developed lower fort and the open northern area. Located outside of the historic fort area to the northeast, the Wherry Quarter contains approximately thirty buildings with less than half the area considered recreation land use. Buildings include two-story red brick residential structures (shown on Figure 4.2-1 as Army family housing) that were designed and constructed in the 1950s as low-cost residential housing. They are in livable condition and continue to serve their intended purpose. Other structures in the Wherry Quarter (shown as community support and administrative land uses on Figure 4.2-1) include a child development center (with adjacent outdoor playground equipment), a bowling center, the Post Exchange (PX), a gas station, warehouses, service and office buildings along with adjacent paved parking areas. Approximately a dozen roads provide access to these buildings, recreation areas and the coastal areas.

Recreation and open space are the predominate land uses in the North Gate area located on the northern end of the peninsula. Developed recreation uses include a recreational vehicle/camper park, beaches and swim club. Manmade features are limited to a few buildings such as the Fort Monroe Club, Community Support as well as ammunition storage, several roads and the Walker Air Field. Most of the land in the North Gate area is undeveloped open space.

The marina and the fitness center are the only recreational facilities located at the southern end. Photographs of many land use features described above are provided in Section 4.3 Aesthetics and Visual Resources (see Figure 4.2-1 for a generalized land use map). Table 4.2-1 presents the land use descriptions and acreages at Fort Monroe.

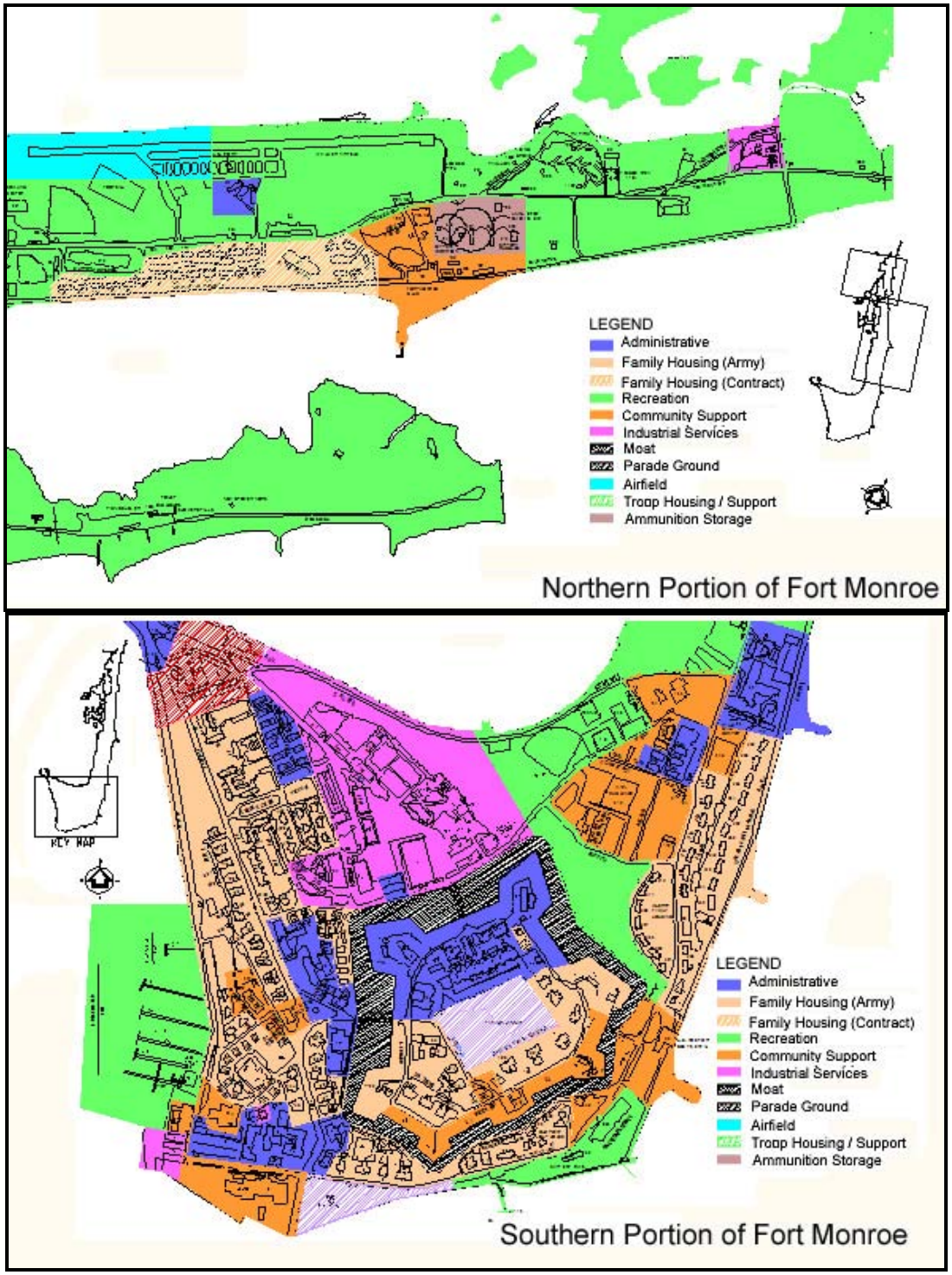
Table 4.2-1 Fort Monroe Land Use - Description and Acreage

Land Use Category	Acres	Percent of Total
Administrative	25	4
Airfield	100	18
Ammunition Storage	9	2
Community Facilities	21	4
Family Housing	72	12
Troop Housing	4	1
Industrial/Service	57	10
Moat	20	4
Parade Grounds	10	2
Recreation	144	25
Other Areas	103	18
TOTAL	565	100

Source: Adapted from Fort Monroe Environmental Master Plan (J.M. Waller Associates 2005).

Further description of the above land use categories are provided below:

- **Administrative.** This category includes office space, with utilities housed in support buildings.
- **Airfield.** Located on the west side of Fort Monroe is the inactive Walker Airfield.
- **Ammunition Storage.** Portions of the casemates and the batteries are also used for storage.
- **Community Facilities.** This category is composed of the PX, a bank and credit union, and a ball field. It also includes the Bay Breeze Community Center that contains a pool, gymnasium, arts and crafts area, an automotive craft shop and adjacent bowling alley.
- **Family Housing.** Family housing is interspersed throughout the southern part of the installation.
- **Troop Housing.** One building is provided for Troop housing.



(Source R&K Engineering 2002)

Figure 4.2-1 Land Use Map for Fort Monroe

- **Industrial/Service.** Industrial/service facilities are located north of Patch Road.
- **Moat.** The moat is less than 8 feet deep, and it ranges in width from 65 to 260 feet.
- **Parade Grounds.** Located within the stone fort, the parade ground is a central green space with surrounding trees, lawns, pathways, and historic objects.
- **Recreation.** Recreation areas include waterfront areas, a marina, beaches, tennis courts, soccer fields, picnic and play areas, a RV park, open space, and a facility for outdoor equipment rental. Along Mill Creek is a nature trail and a floating dock with rental boats.

Additional information regarding land use can be found in Section 3.3 Reuse Alternatives (see also Figures 3.3-1; 4.3-1; the Reuse Plan in Appendix B; and Section 4.3).

4.2.1.3 Surrounding Land and Airspace Use

The communities within Hampton, Virginia, most directly associated with Fort Monroe are Phoebus, through which all traffic into and out of Fort Monroe must pass, and Buckroe/Buckroe Beach, which lies to the north of Fort Monroe and is physically attached to the installation by the sand spit that comprises the northern extremity of the post. Both communities are mixes of residential housing (predominantly single family) and light commercial use.

The Phoebus waterfront is home port to a small commercial fishing fleet. At any given time, about half a dozen vessels are docked adjacent to the causeway that connects Fort Monroe with Phoebus. St. Mary's School is also on the Phoebus waterfront, but it is residential properties that occupy the greatest portion, both to the south along the shoreline between Water Street and Interstate (I)-64, and to the north along the western shoreline of Mill Creek.

Buckroe is known primarily for its two-mile stretch of beach along the Chesapeake Bay, where there is single-family and condominium residential housing, and a public recreational beach area that includes a large public parking area, an entertainment gazebo, a wooden observation pier, and a newly constructed concrete fishing pier that replaces a former fishing pier.

Airspace surrounding Fort Monroe is heavily used by inbound and outbound traffic associated with two major commercial airports: Norfolk International Airport and Newport News – Williamsburg International Airport. Langley AFB and Naval Station Norfolk contribute military air traffic. Traffic generated at NAS Oceana has no significant presence near Fort Monroe.

4.2.1.4 Current and Future Development in Region of Influence (ROI)

The City of Hampton contains ten neighborhood districts and has developed master plans for six of the districts including the two adjacent to Fort Monroe: Phoebus and Buckroe Beach (see Figure 4.2-2). Both master plans summarized below outline an approach to street networks, open space, waterfront access, land use, housing, and commercial development and includes a series of drawings and illustrations to conceptualize the end state.

Source: City of Hampton GIS 2009

Figure 4.2-2 Buckroe Beach and Phoebus Neighborhoods

Phoebus. The Phoebus Master Plan, adopted by the City Council in 2007, acknowledges the close historical relationship and proximity with Fort Monroe. The plan states: "With the anticipated closure and reuse of Fort Monroe and the established historical relationships between the Fort and Phoebus, it was important to coordinate the reuse planning process with the Fort and the master plan for Phoebus. The Phoebus waterfront at the end of Mellen Street is an important gateway to Phoebus and Fort Monroe and is one of the few locations in Phoebus that permits public access to Mill Creek and Hampton Roads. The Plan recommends the creation of a waterfront park on publicly owned land at the end of Mellen Street as it bends around to the bridge to Fort Monroe. With the redevelopment of Fort Monroe, it is anticipated that expansion of retail uses and attractions such as the American Theatre can extend southward along Mellen Street toward the proposed waterfront park and activity area." [2]

Key elements of the Phoebus plan include: new neighborhood gateways; development of a coordinated parking strategy to support new and existing uses along Mellen and Mallory Streets; a public waterfront with coordinated private development, additional community recreation and open space connections; new residential development in the heart of the

[2] Phoebus Master Plan: Hampton, Virginia, 2007 http://www.hampton.gov/community-plan/iframe.html?linkfrom=main&bc=Phoebus%20Master%20Plan&url=pdf/phoebus_master_plan.pdf

community; development of a commercial node at the intersection of Mercury Boulevard and Mallory Street; phased development of properties along Mallory Street; and strategies for neighborhood revitalization in the north and south Phoebus areas.

Current and proposed projects include: expansion of the American Theatre; expansion of the Farm Fresh retail center; new luxury waterfront condominiums; improvements in the infrastructure; development of a new hotel; a seafood market; and new residential development.

Buckroe. The Buckroe Master Plan, adopted by the City Council in 2005, stresses the potential for connections to the redeveloped Fort Monroe. As stated in the plan: "The recent decision to close Fort Monroe may provide additional opportunities to connect and leverage open space amenities for the growth and development of the Buckroe neighborhood. The northern limit of the Fort Monroe property is located adjacent to the study area for the Buckroe Master Plan. This area of Fort Monroe may be appropriate for reuse as open space or for some other public use. Street and open space connections between Buckroe and Fort Monroe will be explored as part of the reuse planning for the fort. The Buckroe Master Plan will be amended if street and open space connections are identified in the Reuse Plan for Fort Monroe." [3]

Key elements of the Buckroe Master Plan include: improvements to the entrances on Mallory Street, Buckroe Avenue, and Pembroke Avenue; establishing new open space with trails, paths, and restored wetlands; creating multifamily, mixed-income communities with architectural design based on Colonial and Victorian styles to reflect the coastal location of Buckroe; and enhancing commercial development by reestablishing Buckroe Avenue as the community Main Street. This would include new commercial space and an overall mix of retail that includes small restaurants and local retail.

Current projects include improvement and redesign of the recreation and open spaces to promote connectivity throughout the Buckroe Area.

4.2.2 Consequences

4.2.2.1 Early Transfer Disposal Alternative

***Direct*.** Minor short-term and minor to moderate long-term adverse effects are expected to occur from early transfer disposal of Fort Monroe. Effects to land use were evaluated based on increased development intensity and the addition of new land uses (lodging and retail) on Fort Monroe as well as building metrics from Table 3.3-3. A primary objective of the Reuse Plan is to minimize the impact on historic structures and permit limited new construction without jeopardizing the fort's NHL status. After disposal, redevelopment of Fort Monroe would lead to

[3] Buckroe Master Plan: Hampton, Virginia, 2005 http://www.hampton.gov/community-plan/iframe.html?linkfrom=main&bc=Buckroe%20Master%20Plan&url=pdf/buckroe_beach_master_plan.pdf

construction, limited demolition, renovation, and new and expanded commercial and residential land use. Therefore, existing land use patterns would change over time on some, but not all, of the Fort Monroe property based on the degree of correlation between the land uses proposed by the Reuse Plan and the existing land use at the fort. In addition, remediation efforts could constrain the timing of redevelopment for some sites.

Land use controls, including dig restrictions would remain in place on Fort Monroe until the investigation of contamination and, if needed, remediation is completed. The Remedial Investigation report for MEC is not complete and is expected to be finalized by mid-2010. Land use controls, such as dig restrictions and construction support will be in place for the entire near-shore and land areas of Fort Monroe pending results of the RI/FS for non-reverting property. In most instances, such land use controls would not preclude excavation or development, but may include protocols and procedures for ensuring that excavations are conducted safely; similar to excavation permitting procedures that are currently in place. For other areas, such as Dog Beach Landfill, land use controls may preclude excavations in perpetuity.

Residential, lodging and retail related land use changes are the greatest change in land use proposed for the redeveloped site, compared to the existing condition. Office, recreation and open space land uses generally will remain after redevelopment, although at different intensities. According to the Reuse Plan, initial efforts will focus on the reuse of existing structures. Although many existing structures will be reused and remain within their existing land use category, such as most of the housing to be reused as residential, the Reuse Plan does include changes in use of some of the structures. For example, the museum library and coast artillery school would potentially be used for residential units and the audio visual support center may be used commercially. These changes are not expected to result in an effect on land use in the long-term.

Following reuse of existing structures, the plan focuses on selective infill, reclamation of underutilized land and the establishment of large scale open space to the north. Inside the fort, the Reuse Plan proposes renovations but does not propose any new structures. There will be no adverse effects to the stone fort area and existing structures as previously discussed. In the short-term, construction and demolition will have minor adverse effects, and although land uses will not change substantially, increased development density will result in long-term minor adverse impacts.

Overall, disposal and redevelopment may result in an unavoidable increase in land use intensity relative to baseline conditions, resulting in a number of land use compatibility concerns (e.g., increased traffic and noise, and increased residential density). In the long-term at full build-out (20 years), it is likely that certain residential areas along major access roads in the Phoebus community and on Fort Monroe will experience minor to moderate noise impacts due to increases in traffic, resulting in land use compatibility concerns.

No appreciable direct effects on airspace use would be expected.

***Indirect*.** Minor beneficial effects are expected. Existing remediation programs will continue under either federal or non-federal ownership. Non-federal ownership could result in the

availability of additional resources for the renovation or removal of facilities that are substandard. An increase in tourism at anticipated levels may generate the need for off-site lodging and dining facilities in adjoining communities of Phoebus and Buckroe. Thus, in the long-term, disposal could indirectly generate minor beneficial effects. The master plans for both these Hampton communities take into account the closure and redevelopment of Fort Monroe.

No appreciable direct effects on airspace use would be expected.

4.2.2.2 Traditional Disposal Alternative

***Direct*.** Minor short-term and minor to moderate long-term adverse effects, similar to those described with the early transfer disposal alternative, are expected. However, with traditional disposal, remedial clean-up actions would be conducted prior to the disposal of non-reverting properties. This would be more beneficial for land use compared to early disposal. For non-reverting property, there would be no difference. Also, in comparison to Early Transfer, these effects would occur further into the future.

***Indirect*.** Minor beneficial effects are expected, similar to the effects outlined for the early transfer alternative.

4.2.2.3 Caretaker Status Alternative

***Direct*.** Moderate beneficial effects are expected. Under the caretaker status alternative, Army activities would cease. The elimination of military operations and related vehicle trips of 10,500 per day to a small fraction of trips for security and maintenance functions will reduce any land use incompatibilities (e.g., decreased traffic, noise) with surrounding residents and other noise sensitive land uses.

***Indirect*.** Long-term minor adverse effects are expected. Renovations that would have otherwise taken place may not be initiated for facilities, resulting in long-term adverse effects relative to status quo operating conditions. Long-term maintenance would not be focused on keeping the facilities in a state of repair to permit rapid reuse. Rather, maintenance during this period would be reduced to the minimum level required for surplus government property. Maintenance would consist of minimal activities intended primarily to ensure security, health, and safety and to avoid physical deterioration. This reduced level of maintenance would continue until disposal. If the excess properties at Fort Monroe were to be maintained in caretaker status for an extended period, the condition of buildings, facilities, roadways, and utility system components could be expected to gradually decline.

4.2.2.4 No Action Alternative

No direct or indirect effects are expected under the no action alternative. For this alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure and realignment, which would affect neither land use on Fort Monroe nor land use patterns external to the installation. No effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.2.2.5 Intensity-Based Probable Use Scenario

Effects to land use were evaluated by comparing the existing land uses or baseline condition with increased development intensity and the potential conflicts created by the addition of new land uses (lodging and retail) on Fort Monroe. Building metrics from Table 3.3-3 were used as the basis of the comparison and evaluation.

The Army's environmental restoration efforts for Fort Monroe will attempt to accommodate the land use and redevelopment needs presented in the Reuse Plan. While the Army has little influence on reversionary property once it leaves Fort Monroe, for non-reversionary property the Army may restrict certain types of future land use (e.g., residential use in certain areas), impose institutional controls, or take other actions affecting land use to protect human health and the environment. Such restrictions would be included in conveyance documents as restrictions on future land use.

Lower Bracket, Direct. Minor short- and long-term beneficial effects are expected from changes in land use and new construction. With this scenario, approximately 100,000 SF of new non-residential development and 100,000 SF of renovated non-residential development would be constructed. Also, a total of 250 units of residential/lodging would be created on-site principally through the renovation of existing structures in the lower fort area. The newly created units would be situated with an average density of approximately one unit per acre. Along with these land use changes, there would be 2,400 less people on-site compared to the baseline condition (taking into account projected changes in employment, residential population, lodging, and projected tourism as compared to baseline conditions). Land use conflicts resulting from this scenario are not expected. This scenario would result in a reduction in noise impacts to residential and other noise sensitive land uses from the decreased level of traffic compared with the baseline condition (see Section 4.5.2.5).

Lower Bracket, Indirect. Minor to moderate long-term beneficial effects are expected. This scenario is beneficial to and compatible with the Phoebus and Buckroe Master Plans. The Phoebus Master Plan anticipates an expansion of retail uses extending southward along Mellen Street along with the redevelopment of Fort Monroe. The Buckroe Master Plan foresees additional opportunities to connect and leverage open space amenities located at the northern limit of Fort Monroe for the growth and development of the Buckroe neighborhood with the closure and redevelopment of the installation.

Middle Bracket, Direct*.* Minor short- and long-term beneficial and moderate adverse effects are expected. Effects to land use from increased development intensity were evaluated based on building metrics from Table 3.3-3. Using the same methodology, the effects of expanding the existing land uses on Fort Monroe were also evaluated. Overall, the Reuse Plan envisions a mixed use of property, with reuse focusing primarily on a balanced mix of residential, business/commercial, and conservation uses that would include construction of new facilities. Reuse of the Fort Monroe property, including reuse of historic structures and construction of new structures, would increase the monetary value of land on the installation creating minor beneficial effects. Under this scenario land uses on the majority of the installation would remain functionally the same or similar to the baseline condition and would be within the range of current use. Although significant land use conflicts are not expected, increased development

intensity would create unavoidable increases in traffic, noise, and visitation which will generate minor to moderate land use conflicts between residential and non-residential areas.

With this scenario, approximately 100,000 SF of new non-residential development and 900,000 SF of renovated non-residential development would be generated in the lower fort area. Also, 1,300 units of residential/lodging would be created on-site at a density of 6 units per acre. Approximately 10 percent of these would be through renovation of existing residential structures and the majority would be new construction principally in the lower fort area. Changes to the Wherry Quarter would be minimal. Overall, these changes equate to approximately two times the development intensity relative to baseline conditions and the Lower Bracket scenario. The airstrip, which is not actively used, would be removed. Approximately 15 acres (5 percent) of green open space would also be lost under this scenario. Along with these noted land use changes, there would be 1,400 additional people on-site compared to the baseline condition (taking into account projected changes in employment, residential population, lodging, and projected tourism as compared to baseline conditions).

Residential land use and other land uses classified as sensitive to noise (schools, churches, medical facilities) would experience long-term moderate adverse effects resulting from increased traffic along major roads (see Section 4.5.2.5).

***Middle Bracket, Indirect*.** Minor beneficial effects are expected. Under non-federal ownership, additional resources could become available to remove or convert buildings and facilities that are not consistent with the adjacent land uses, and repair buildings and facilities that are in need of repair. Thus, in the long-term, disposal could indirectly generate minor beneficial effects.

An increase in tourism at anticipated levels may generate the need for off-site lodging and dining facilities in adjoining communities. This scenario is compatible with the Phoebus and Buckroe Master Plans, which include provisions for increased lodging and food service, and the effects are considered beneficial. The Phoebus Master Plan anticipates an expansion of retail uses extending southward along Mellen Street along with the redevelopment of Fort Monroe. The Buckroe Master Plan foresees additional opportunities to connect and leverage open space amenities located at the northern limit of Fort Monroe for the growth and development of the Buckroe neighborhood with the closure and redevelopment of the installation.

Upper Bracket, Direct. Short- and long-term minor beneficial and moderate adverse effects are expected. This intensity of reuse would be above the baseline condition intensity of use of the property. Direct effects similar to but greater in magnitude than those expected for the Middle Bracket scenario would also occur in this scenario. Overall, land uses on the majority of the installation would remain functionally the same or similar to existing use. Therefore, only minor to moderate land use conflicts between residential areas and non-residential areas are expected from unavoidable increased development intensity, noise, and traffic. With this scenario, approximately 200,000 SF of new non-residential development and 1,000,000 SF of renovated non-residential development would be constructed in the lower fort area. Also, 1,500 units of residential/lodging units would be created on site at a residential density of 7 units per

acre. Most of these would be new construction and less than 10 percent would be from renovation of existing structures. Increased development beyond the levels specified for the Middle Bracket scenario (i.e., 200 additional residential units and 200,000 SF of non-residential development) would mainly occur in the Wherry Quarter, where some demolition of existing structures would occur. These changes equate to approximately a 10 percent increase in development intensity relative to the Middle Bracket scenario. The airstrip, which is not actively used, would be removed and approximately 25 acres (10 percent) of green open space would be lost under this scenario. Along with these noted land use changes, there would be 2,700 additional people on-site compared to the baseline condition (taking into account projected changes in employment, residential population, lodging, and projected tourism as compared to baseline conditions).

Residential land use and other land uses classified as sensitive to noise (schools, churches, medical facilities) would experience long-term moderate adverse effects resulting from increased traffic along major roads (see Section 4.5.2.5).

The Reuse Plan envisions a mixed use of property, with reuse focusing primarily on a balanced mix of residential, business/commercial, and conservation uses that would include construction of new facilities. Reuse of the Fort Monroe property, including reuse of historic structures, and construction of new structures, would increase the monetary value of land on the installation. Land uses on the majority of the installation would remain functionally the same or similar to existing uses and would be within the range of current use.

Moderate adverse effects to open space and recreation land uses may occur as a result of increased development intensity, particularly in the North Gate and Wherry Quarter areas. While disposal and reuse of Fort Monroe will reduce the amount of remaining open space, the majority of the current open space will be preserved. The residential buildings located in the Wherry Quarter may eventually be replaced. To minimize effects to open space and recreation areas, the footprint of new development may be located in the same geographic area of disturbance as these buildings, other existing buildings or previously existing buildings or parking lots.

Upper Bracket, Indirect. Minor beneficial effects are expected. Under non-federal ownership and at the discretion of the new owner, additional resources could become available to remove or convert buildings and facilities that are not consistent with the adjacent land uses, and repair buildings and facilities that are in need of repair. Thus, in the long-term, disposal could indirectly generate minor beneficial effects.

An increase in tourism at anticipated levels may generate the need for off-site lodging and dining facilities in adjoining communities. Because this scenario is compatible with the Phoebus and Buckroe Master Plans, which includes provisions for increased lodging and food service, the effects are considered beneficial. The Phoebus Master Plan anticipates an expansion of retail uses extending southward along Mellen Street along with the redevelopment of Fort Monroe. The Buckroe Master Plan foresees additional opportunities to connect and leverage open space amenities located at the northern limit of Fort Monroe for the growth and development of the Buckroe neighborhood with the closure and redevelopment of the installation.

4.3 AESTHETICS AND VISUAL RESOURCES

4.3.1 Affected Environment

4.3.1.1 Visual Environment

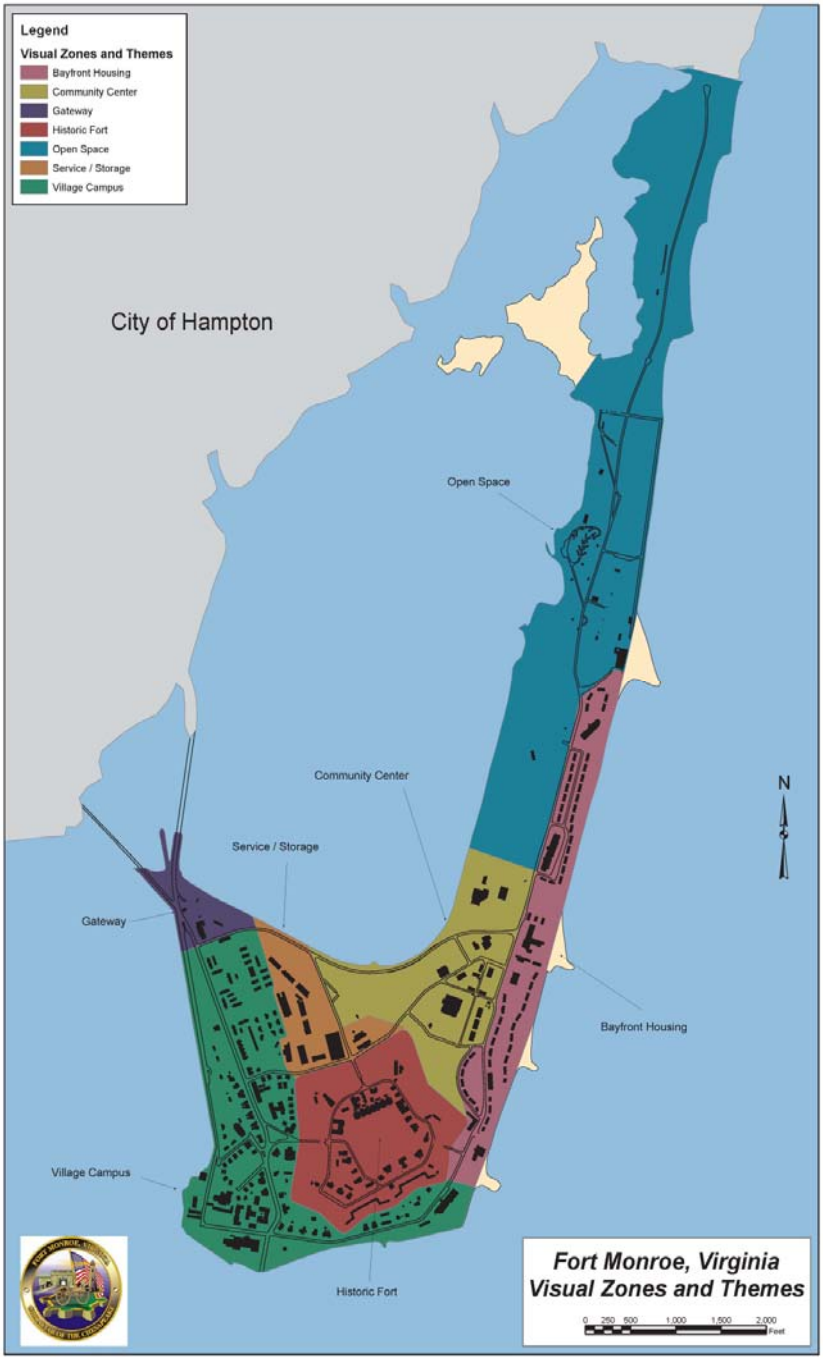
A visual resource is generally defined as an area of unique beauty that is a result of the combined characteristics of the natural aspects of land and human aspects of land use. Wild and scenic rivers, topography, and geologic landforms are components of the natural aesthetic aspects of land. Examples of human-created aesthetic aspects of land use include scenic highways, architectural elements within historic districts, and cultural landscapes. The assessment of visual and aesthetic value involves a characterization of existing natural and man-made resources in the study area. Changes in visual character are influenced by social considerations, including public value placed on the resource, public awareness of the area, and general community concern for visual resources in the area.

Fort Monroe has areas that are currently protected by various laws and by implementation of the Integrated Natural Resources Management Plan (INRMP) and the Integrated Cultural Resources Management Plan (ICRMP). These plans establish standard operating procedures to ensure compliance with applicable laws and regulations that facilitate the management and preservation of significant natural resources and historic properties. Fort Monroe has no wild or scenic rivers or majestic topography. Fort Monroe lies on an essentially low and flat coastal landform, with diverse types of shorelines, including sandy beaches, marshes, and seawall with an open promenade. Fort Monroe's visual zones, shown in Figure 4.3-1, are associated with the bay-front housing and its extensive beachfront, community center, gateway, historic fort, open spaces, service/storage areas, and the village campus. Photos showing "typical views" for each zone are displayed in Figure 4.3-2. The village campus area contains not only the installation's highest density of historic homes, but also adding high visual appeal are St. Mary's Church and Rectory, the Chamberlin, USCG's Old Point Comfort Lighthouse, and Old Point Comfort Marina.

4.3.1.2 Visual Quality of the Surrounding Properties

Low-density residential housing bounds Fort Monroe to the northwest on the opposite shoreline of Mill Creek. Density of the homes is greater toward the south, where Mill Creek meets the East Mercury Boulevard causeway onto Fort Monroe, and diminishes to the north where land parcels are larger. Small boat piers are densely and evenly distributed along the lower half of this shoreline and very sparse above and to the north. To the southwest is a causeway component of I-64 that carries the highway traffic to and from the Hampton Roads Bridge-Tunnel (HRBT). To the south and east of Fort Monroe are Hampton Roads Harbor and the Chesapeake Bay, respectively. The Port of Virginia is one of the nation's busiest; it is the 7th largest U.S. port in terms of both tonnage and dollars. Norfolk International Terminal is the Port of Virginia's largest terminal (Port of Virginia 2009) and commercial shipping traffic is always part of the seaward of harbor viewscape. Fort Monroe is not bounded by waterbodies protected by the Wild and Scenic Rivers Act of 1968, as amended, but the water views across the Chesapeake Bay and Hampton Roads Harbor are visually very appealing. The open waters of the bay and harbor, particularly in summer, display a broad range of recreational

watercraft from kayaks and wind-surfers to small power boats, cruising sailboats, and luxury motor yachts.



Source: R&K Engineering 2002

Figure 4.3-1 Visual Zones and Themes

Typical view of Village Campus Zone

Typical view Historic Fort Zone

Typical view of Gateway Zone

Typical view of Bayfront Housing Zone

Typical view of Service/Storage Zone

Typical view of Open Space Zone

Figure 4.3-2 Photos of Visual Zones and Themes of Fort Monroe, VA

4.3.1.3 Visually Sensitive Resources

The most sensitive visual resources are the historic properties within Fort Monroe, the village campus outside the moat and, unquestionably, the fort within the moat. These historic properties are described more fully in Section 4.9 Cultural Resources. The

open spaces along the northern portion of the installation and the beaches along the Chesapeake Bay shoreline are also sensitive to changes that may occur on Fort Monroe. Sensitivity, in these cases, refers to changes in how the visual resources will appear from other vantage points, and how other vantage points will appear from the resources. Example photographs of visually sensitive resource features are displayed in Figure 4.3-3.

Beach Area

Scenic Residential Street

The Fort (Source: Fort Monroe Reuse Plan)

Inner Fort

Quarters Number 1

Figure 4.3-3 Visual Resource Features of Fort Monroe, VA

4.3.1.4 Other Visual Resources North of the Historic Fort

The Wherry Quarter can be considered a visual transition area between the highly developed lower fort and the open northern area. The visual quality of the Wherry Quarter is substantially

less than that of the historic fort area due to the unremarkable architectural features of the building structures and lack of thoughtfully designed landscaping and street network. The best views from the Wherry Quarter are of the open waters of Mill Creek to the west and the Chesapeake Bay across the street with its headland breakwaters. Especially from the western portion of the Wherry Quarter, views are unobstructed across open grass and recreation areas. Otherwise views within the Wherry Quarter are primarily of buildings, parking lots, and roads. Views to the area from the Chesapeake Bay are dominated by the row of residential buildings, utility poles, beach, and seawall.

The open space and recreational areas on the northern end of the peninsula provide panoramic views to both Mill Creek and the Chesapeake Bay. The northern area peninsula narrows as one travels north, offering more views of trees, other natural vegetation and open water. The visual quality of manmade features in this area is relatively low as they lack architectural significance when compared to the historic fort. These features include the Fort Monroe Club and Community Support building, as well as ammunition storage, the Walker Air Field and several roads. Trees are the primary features viewed from the Chesapeake Bay to the North Gate area, along with the beach in the foreground. (see Section 4.2.1.2 for further discussion of descriptions of the Wherry Quarter and North Gate areas).

Example photographs of visual resource features north of the historic fort are displayed in Figure 4.3-4.

4.3.2 Consequences

4.3.2.1 Early Transfer Disposal Alternative

Direct. Minor long-term adverse and beneficial effects are expected. Effects to visual quality were evaluated based on changes to landscapes and historic structures as described in the Reuse Plan, increased development intensity including the proposed new construction on Fort Monroe as well as building metrics from Table 3.3-3.

Wherry Housing – Viewed from Chesapeake Bay

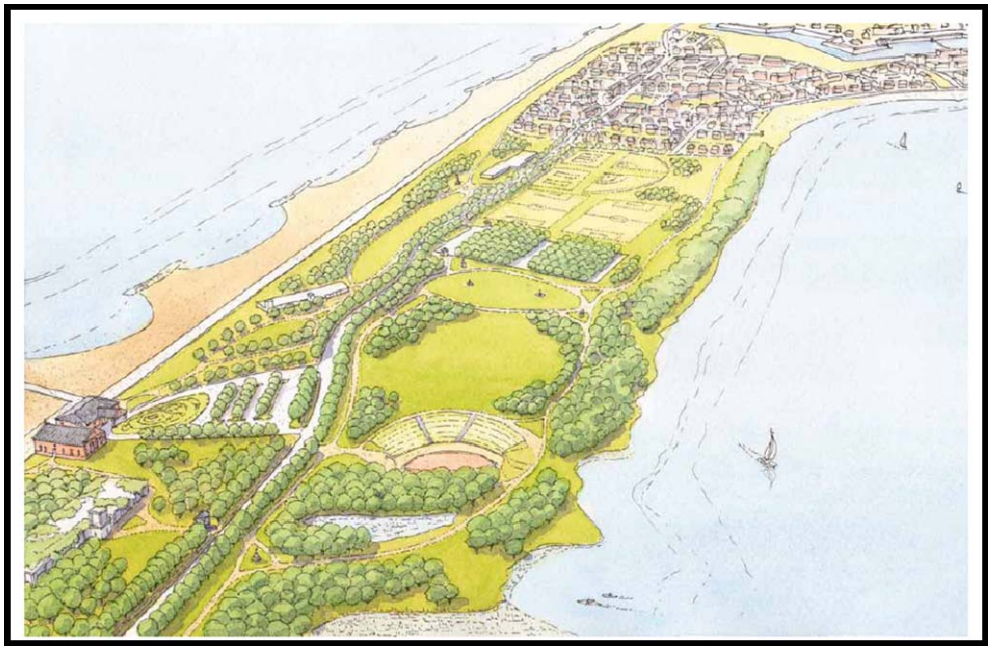
Thrift Shop

Wherry Housing - Viewed from beach

Wherry Quarter Open Space – North of Wherry Housing

Figure 4.3-4 Visual Resource Features of Wherry Quarter, Fort Monroe, VA

Visual quality at Fort Monroe would experience beneficial effects to existing historic structures, landscapes and viewsheds based on the protections and enhancements outlined in the PA and the Reuse Plan. The PA committed the Army to prepare a viewshed study of Fort Monroe and the Reuse Plan emphasizes the preservation of significant landscapes and viewsheds, including the open space/recreation areas, views and natural areas (marsh and wetlands) at the northern end of the fort. Figure 4.3-5 is an artist rendering (looking southward) of the fort's north end depicting the potential future condition with open space and recreational areas. Figure 4.3-6 is an aerial oblique (developed from a Google Earth image) of the open space and recreation areas existing today.



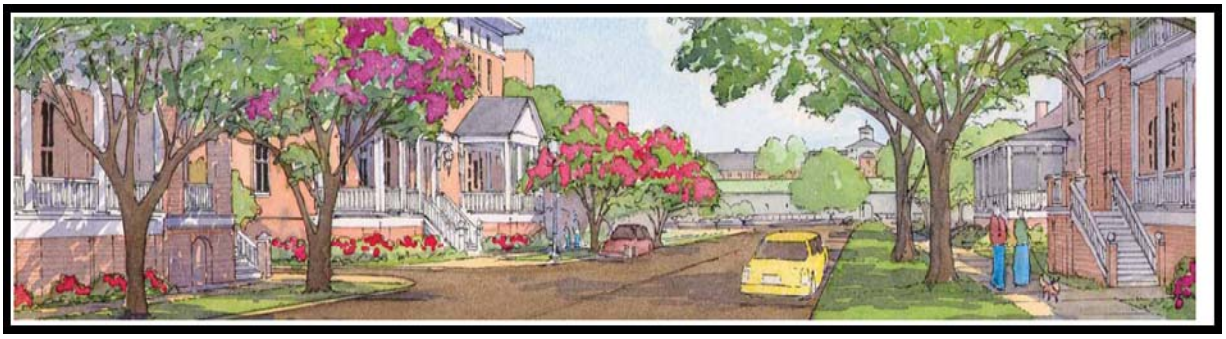
Source: Fort Monroe Reuse Plan, November 2006

Figure 4.3-5 North Portion of Fort Monroe, Future Condition

Source: Google Earth 2010

Figure 4.3-6 North Portion of Fort Monroe, Existing Conditions

The plan places a high priority on preserving, maintaining, and reusing historic buildings on Fort Monroe and it envisions the preservation of the majority of contributing buildings located within the Fort Monroe NHL District. In addition, the Reuse Plan and the PA would require design standards to control and restrict the height, form, architecture styles, and geographic extent of new development to maintain the NHL designation. The Reuse Plan includes planning to address visual resources that will be preserved or developed, for example it states that new streets would be visually appealing due in part to the inclusion of street trees and a narrower expanse of pavement. The improvements to streets would result in a long-term beneficial effect to visual quality on the installation property. Another beneficial effect of redevelopment based on the Reuse Plan, is the proposed conversion of the surface parking lot located in a portion of the parade ground to a central green space, thus enhancing the visual quality of this area. Figure 4.3-7 shows an “after” artist rendering of the North Gate Road depicting the potential future condition of a residential area with street trees and sidewalks followed by a photograph showing a “before”, or existing condition, of the same location (see Figure 4.3-8).



Source: Fort Monroe Reuse Plan, November 2006

Figure 4.3-7 North Gate Road, Future Condition

Source: Fort Monroe Reuse Plan, November 2006

Figure 4.3-8 North Gate Road, Existing Conditions

The Reuse Plan envisions a public waterfront esplanade along the existing seawall from the Old Point Comfort Lighthouse to Engineer Pier, allowing residents and visitors improved access to unobstructed views of open water.

The management programs, and projects outlined in the ICRMP for Fort Monroe may not be fulfilled to the same degree once the parcels are disposed of and moved from federal to non-federal ownership. Federal regulations will not be applicable following transfer, except to the extent that these may be applicable in connection with federal grants. State and local regulations may apply where NHL designated properties are concerned.

The Reuse Plan gives no clear direction on the ultimate disposition of the housing units in the Wherry Quarter. It can only be assumed that, whether the units are removed or renovated, the net effect would be beneficial effects on aesthetics and visual resources.

Indirect. No effects are expected.

4.3.2.2 Traditional Disposal Alternative

Direct. Minor long-term adverse and beneficial effects are expected. Effects would be similar to those described under the early transfer disposal alternative, but the changes in effects would take place further in the future.

Indirect. No effects are expected.

4.3.2.3 Caretaker Status Alternative

Direct. Minor to moderate long-term adverse effects are expected. Under the caretaker status alternative, the appearance of buildings and grounds could decline and deteriorate over time, decreasing the aesthetic value of the installation properties. Renovations that would have otherwise taken place may not be initiated for facilities, resulting in long-term adverse effects relative to their appearance. Long-term maintenance would be reduced to required levels specified in the PA (see Appendix F). Long-term maintenance levels will ensure security, health and safety and to avoid physical deterioration, but not necessarily preserve the visual quality of Fort Monroe. If the excess properties at Fort Monroe were to be maintained in a caretaker status for an extended period, the condition of some buildings and facilities could be expected to gradually decline and deterioration would reduce their visual appeal.

Indirect. No effects are expected.

4.3.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendation for closure. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.3.2.5 Intensity-Based Probable Use Scenario

Lower Bracket, Direct. Minor short- and long-term beneficial and adverse effects are expected. Effects to visual quality were evaluated based on changes to landscapes and historic structures

as described in the Reuse Plan, increased development intensity including the proposed new construction on Fort Monroe, as well as building metrics from Table 3.3-3. Restoration site-clearing and construction activities would result in a short-term adverse visual effect that would likely be contained within the Fort Monroe property. With the Lower Bracket scenario, there would be no change in the amount of open space, or loss of natural areas and their respective viewsheds in comparison to the baseline condition. The northern end of the peninsula, currently the location of open space and recreational areas, is projected to be preserved and enhanced under the Reuse Plan, thus maintaining the visual appeal of the area. With this scenario, new construction would be added to the viewshed in the form of approximately 100,000 SF of new non-residential development and 100,000 SF of renovated non-residential development. Also, 250 units of residential/lodging would be created on-site principally through the renovation of existing structures in the lower fort area (see Section 3.3.5 for further discussion). The newly created units would be situated with an average density of approximately one unit per acre. Based on the protections and enhancements outlined in the PA and the Reuse Plan, the proposed renovations and new construction, would present a long-term minor beneficial change in visual character compared with the baseline condition.

The management programs, and projects outlined in the ICRMP for Fort Monroe may not be fulfilled to the same degree once the parcels are disposed of and moved from federal to non-federal ownership. Federal regulation will not be applicable following transfer except to the extent that these may be applicable in connection with federal grants. State and local regulations may apply to NHL designations and other historic properties.

Lower Bracket, Indirect. Minor beneficial effects are expected. Vehicular traffic would be less than half of the baseline condition. This decrease in traffic flow could create a beneficial visual impact for surrounding neighborhoods and on Fort Monroe.

Middle Bracket, Direct. Minor short- and long-term beneficial and adverse effects are expected. Building metrics from Table 3.3-3 were the basis for evaluating the effects on visual quality from changes to landscapes and historic structures, and increased development intensity, including the proposed new construction on Fort Monroe, as described in the Reuse Plan. Restoration site-clearing and construction activities would result in an unavoidable short-term adverse visual effect that would likely be contained within the Fort Monroe property. As redevelopment of the property proceeds, infill development could create attractive buildings designed to blend into the historical fabric of the installation.

With the Middle Bracket scenario, there would be a 5 percent (15 acres) loss of open space and less than one percent loss of natural areas and their respective viewsheds in comparison to the baseline condition, which results in a minor long-term adverse effect (see Section 4.8.2 for further discussion of natural area impacts). The impact to natural areas would involve a potential loss of less than 2 acres of tidal wetlands in the event that a northern entrance is constructed. Loss of open space (15 acres) includes development in highly disturbed areas which are now maintained as open lawns and fields, principally in the northeastern portion of the lower fort (i.e., the North Gate area and far western portion of the Wherry Quarter).

While disposal and reuse of Fort Monroe will reduce the amount of remaining open space, the majority of the current open space will be preserved. To minimize effects to open space and recreation areas, the footprint of new development may be located in the same geographic area of disturbance as existing buildings, previously existing buildings, and/or parking lots. The Reuse Plan allows the opportunity for the northern area to be preserved as open or recreational space, including new open space, recreational facilities, pedestrian trail system, parks, and expansion of the beach.

The visual appeal of these areas is expected to remain largely intact. The majority of the current open space will be preserved with many of the vistas unchanged. The overall historic character will be enhanced by removal of the non-historic buildings, to be replaced by higher density structures that blend with the historic nature of the lower fort based on the design guidelines included in the PA.

New construction would be added to the viewshed in the form of approximately 100,000 SF of new non-residential development and 900,000 SF of renovated non-residential development in the lower fort area. Also, 1,300 units of residential/lodging would be created on-site at a density of 6 units per acre. Approximately 10 percent of these would be through renovation of existing structures and the majority would be new construction. Changes to the Wherry Quarter would be minimal. Based on the protections and enhancements outlined in the PA and the Reuse Plan, the proposed renovations and new construction would present a long-term minor beneficial change in visual character compared with the baseline condition. In addition, removal of the existing inactive Walker Airfield and recreational refurbishment of the area will result in net beneficial effects to the viewsheds in this area (see Figures 4.3-5 and 4.3-9).

Source: Google Earth 2009

Figure 4.3-9 Walker Airfield, Existing Conditions

***Middle Bracket, Indirect*.** Minor adverse effects would be expected. Increased tourism and residential and commercial development on Fort Monroe would carry over into the communities of Phoebus and Buckroe and fill storefronts that are now vacant. Following the guidance and the spirit of the master plans for these communities, as well as zoning and other controls in place by the city, this would create a visual benefit. Unavoidable increases in traffic flow to and from Fort Monroe would be expected, which in turn would create a negative visual impact to the fort and its surrounding neighborhoods.

Upper Bracket, Direct. Minor short- and long-term beneficial and adverse effects are expected, but to a slightly greater extent than for the Middle Bracket scenario. In comparison, there would be a minor increase in construction. Restoration, site-clearing and construction activities would result in unavoidable short-term adverse visual effects that would likely be contained within the Fort Monroe property. As redevelopment of the property proceeds, infill development could create attractive buildings designed to blend into the historical fabric of the installation.

Building metrics from Table 3.3-3 were the basis for evaluating the effects on visual quality from changes to landscapes and historic structures, and increased development intensity, including the proposed new construction on Fort Monroe, as described in the Reuse Plan. With the Upper Bracket scenario, there would be a 10 percent (25 acres) loss of open space, and less than one percent loss of natural areas and their respective viewsheds in comparison to the baseline condition, which results in a minor long-term adverse effect (see Section 4.8.2 for further discussion of natural area impacts). The impact to natural areas would involve a potential loss of less than 2 acres of tidal wetlands in the event that a northern entrance is constructed. Loss of open space (25 acres) includes development in highly disturbed areas which are now maintained as open lawns and fields, principally in the lower fort area (i.e., North Gate) and the Wherry Quarter. Removal of Army buildings and residential structures in the Wherry Quarter to make way for new development will create both positive effects (i.e., removal of structures that are aesthetically incompatible with the fort's historic buildings) and adverse effects (loss of coastal open space from higher intensity development).

The northern end of the peninsula, currently the location of open space and recreational areas, is projected to be largely preserved and enhanced under the Reuse Plan, thus maintaining the visual appeal of the area. New construction would be added to the viewshed in the form of approximately 200,000 SF of new non-residential development and 1,000,000 SF of renovated non-residential development in the lower fort area. Also, 1,500 units of residential/lodging units would be created on site at a residential density of 7 units per acre. Most of these would be new construction and less than 10 percent would be from renovation of existing structures. Increased development beyond the levels specified for the Middle Bracket scenario (i.e., 200 additional residential units and 200,000 SF of non-residential development) would mainly occur in the Wherry Quarter, where some demolition of existing structures would occur, as previously discussed. New construction and replacement of some existing structures in the Wherry Quarter would blend better into the historical fabric of the lower fort area, as compared to many existing structures which were built in later time periods. Based on the protections and enhancements outlined in the PA and the Reuse Plan, the proposed renovations and new construction, would present a long-term minor beneficial change in visual character compared with the baseline condition.

Upper Bracket, Indirect. Minor adverse effects would be expected. Increased tourism and residential and commercial development on Fort Monroe would cascade into the communities of Phoebus and Buckroe and fill storefronts that are now vacant. Following the guidance and the spirit of the master plans for these communities, as well as zoning and other controls in place by the city, this would create a visual benefit. Unavoidable increases in traffic flow to and from Fort Monroe would also result, which in turn would create a negative visual impact to the fort and to its surrounding neighborhoods.

4.4 AIR QUALITY

This air quality analysis includes a description of the local meteorology, existing air quality conditions, a general conformity applicability analysis, a regulatory review, and summary of the existing emissions sources at Fort Monroe.

4.4.1 Affected Environment

4.4.1.1 Local Meteorology

The climate of the Hampton Roads area is temperate with hot and humid summers and mild winters. Average high temperatures range from 49 degrees Fahrenheit (^{o} F) in winter to 88^{o} F in summer, and average low temperatures range from 32^{o} F in winter to 71^{o} F in summer. The interaction between the Chesapeake Bay, Appalachian Mountains, and the Atlantic Ocean influence the climate of Fort Monroe. Long periods of hot weather are unusual and winters are rather mild, with short–lived cold spells. The last freeze is typically in April and the first freeze is usually in November. The Bermuda High pressure area has a dominant effect on Fort Monroe weather, particularly in the summer months. East or northeast winds produce the most unpleasant weather, although southerly winds are quite humid during the summer (National Climatic Data Center 2001).

Average annual precipitation is 47 inches of rainfall and 6 inches of snowfall. Most of the rain falls in the spring and summer months. The Hampton Roads area is affected by a hurricane or tropical storm once every year, on average.

4.4.1.2 Regulatory Authorities and Air Quality Attainment Status

National Ambient Air Quality Standards and Attainment Status

Fort Monroe is located in the City of Hampton, Virginia. VDEQ and USEPA Region 3 regulate air quality in the City of Hampton.

The USEPA has divided the country into geographical regions, known as Air Quality Control Regions (AQCR). The City of Hampton (and therefore Fort Monroe) is located in the Norfolk-Virginia Beach-Newport News AQCR, also known as the Hampton Roads area. The air quality in each AQCR must meet the National Ambient Air Quality Standard (NAAQS). There are NAAQS for each of the criteria pollutants (carbon monoxide [CO], nitrogen oxide, ozone [O_3], sulfur oxides [SO_x], PM_{10} [particulate matter ≤10 microns], $PM_{2.5}$ [particulate matter ≤ 2.5 microns], and lead). Criteria pollutants are those upon which USEPA has placed the greatest emphasis and has developed health-based concentrations for ambient air. There are primary NAAQS for protection of public health and secondary NAAQS for the protection of public welfare (effects on soils, vegetation, climate, economic value, personal comfort, and welfare).

Compliance with the NAAQS is determined through the use of ambient air monitoring stations located throughout the Commonwealth, including monitors in the vicinity of Fort Monroe. Federal regulations designate AQCRs in violation of the NAAQS as nonattainment areas (NAA). Federal regulations designate AQCRs with levels below the NAAQS as attainment areas as shown in Table 4.4-1. Maintenance AQCRs are areas that have previously been designated nonattainment and have been redesignated to attainment for a probationary period through

implementation of maintenance plans. According to the severity of the pollution problem, NAAs can be categorized as marginal, moderate, serious, severe, or extreme.

Table 4.4-1 Norfolk-Virginia Beach-Newport News AQCR Attainment Status

Air Pollutant	USEPA Standard	Concentration	Remarks	AQCR Classification
Particulate matter ≤ 10 microns	Primary and Secondary Standard	Revoked	Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).	N/A
	Primary and Secondary Standard	150 g/m³	The standard is attained when the number of days per calendar year with a 24-hour average above 150 g/m³ is equal to or less than one	Attainment
Particulate matter ≤ 2.5 microns	Primary and Secondary Standard	15 g/m³	The standard is attained when the 3-year average annual weighted mean is less than or equal to 15 g/m³	Attainment
	Primary and Secondary Standard	35 g/m³	The standard is attained when the 3-year average of the 98th percentile of 24-hour concentrations within an area must not exceed 35 g/m³.	Attainment
Sulfur dioxide [SO_2]	Primary Standard	80 g/m³	Annual arithmetic mean	Attainment
	Primary Standard	365 g/m³	Maximum 24-hour concentration not to be exceeded more than once per year	Attainment
	Secondary Standard	1,300 g/m³	Maximum 3-hour concentration not be exceeded more than once per year	Attainment
Carbon monoxide	Primary Standard	10 mg/m³	8-hour average not to be exceeded more than once per year	Attainment
	Primary Standard	40 mg/m³	1-hour average not be exceeded more than once per year	Attainment
Ozone	Primary and Secondary Standard	157 g/m³	The standard is attained when the 3-year average of the 4th-highest daily maximum 8-hour average concentration measured at each monitor within an area over each year must not exceed 157 g/m³.	Maintenance
Nitrogen dioxide	Primary and Secondary Standard	100 g/m³	Annual arithmetic mean not to be exceeded	Attainment
Lead	Primary and Secondary Standard	1.5 g/m³	Quarterly average not to be exceeded.	Attainment
Source: 40 CFR 50 g/m^3 – grams/cubic meter				

The USEPA has designated the Norfolk-Virginia Beach-Newport News AQCR as the following:

- Maintenance for the 8-hour O_3 NAAQS; and
- Attainment for all other criteria pollutants (40 CFR 81.347).

State Implementation Plan (SIP)

The 1990 amendments to the CAA mandated that each state adopt a SIP that targets the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS.

Because monitored levels of O_3 in the Norfolk-Virginia Beach-Newport News AQCR exceeded the 8-hour NAAQS, the Commonwealth of Virginia was required to develop a SIP that outlined the actions that would be taken to achieve the 8-hour NAAQS before 2007. The VDEQ submitted an 8-hour Ozone Maintenance Plan in October 2006, and it was approved by USEPA on 29 May 2007. The maintenance plan outlines the emissions budget for the Norfolk-Virginia Beach-Newport News AQCR through 2018.

Since 1990, Virginia has developed air quality regulations that have been approved by USEPA. These approvals signified the development of the general requirements of the Hampton Roads SIP. The VDEQ program for regulation of air emissions affects industrial sources, commercial facilities, and residential development activities. Regulation occurs primarily through a process of reviewing engineering documents and other technical information, applying emission standards and regulations in the issuance of permits, performing field inspections, and assisting industries in determining their compliance status with applicable requirements.

Clean Air Act (CAA) Conformity

The 1990 amendments to the CAA require federal agencies to ensure that their actions conform to the SIP in a nonattainment or maintenance area. The USEPA has developed two distinctive sets of conformity regulations, one for transportation projects and one for non-transportation projects.

The disposal of Fort Monroe is a non-transportation project within a maintenance area. Therefore, a general conformity analysis is usually required with respect to the 8-hour O_3 NAAQS, unless the action is exempt, as further discussed in Section 4.4.2.

The general conformity rule specifies threshold emission levels by pollutant to determine the applicability of conformity requirements for a project (Table 4.4-2). For a maintenance area of the 8-hour O_3 NAAQS outside the ozone transport region, the applicability criterion is 100 tons per year (tpy) for Nitrogen oxides (NO_x) and 100 tpy for Volatile Organic Compounds (VOC) (40 CFR 93.153).

Table 4.4-2 Applicability Thresholds for Nonattainment/Maintenance Areas

Criteria Pollutants	Applicability Threshold (tpy)
O_3 (NO_x or VOCs)	
Serious NAAs	50
Severe NAAs	25
Extreme NAAs	10
Other O_3 NAAs outside an O_3 transport region	100
Marginal and Moderate NAAs Inside an O_3 Transport Region	
VOC	50
NO_x	100
CO, SO_2, or NO_x	
All NAAs	100
PM_{10}	
Moderate NAAs	100
Serious NAAs	70
$PM_{2.5}$ ($PM_{2.5}$, SO_2, NO_x, or VOC)	
All NAAs	100
Lead	
All NAAs	25
Sources: 40 CFR 93.153; USEPA 2006	

Local Ambient Air Quality

The City of Hampton has a mix of uses varying from industrial and densely populated residential areas to marshes and beaches. The population of the City of Hampton is approximately 146,437 (U.S. Census 2000). Two interstates, I-64 and I-664, traverse the city. Existing ambient air quality conditions in the vicinity of Fort Monroe can be estimated from measurements conducted at air quality monitoring stations close to the installation. The most recent available data from USEPA for nearby monitoring stations are used to describe the existing ambient air quality conditions at Fort Monroe (Table 4.4-3). The most recent air quality measurements meet the NAAQS.

Table 4.4-3 2005 Local Ambient Air Quality Monitoring Results

Pollutant	Primary NAAQS[a]	Secondary NAAQS[a]	Monitored data[b]	Location
CO				
1-Hour Maximum (ppm)[c]	35	None	4.8	Hampton
8-Hour Maximum (ppm)[c]	9	None	1.8	Hampton
NO_2				
Annual Arithmetic Mean (ppm)	0.053	0.053	0.010	Charles City
O_3				
8-Hour fourth highest (ppm)[d]	0.08	0.12	0.078	Hampton
$PM_{2.5}$				
24-Hour 98th Percentile (µg/m³)[f]	35	35	26.9	Hampton
Annual Arithmetic Mean (µg/m³)[e]	15	15	12.5	Hampton
PM_{10}				
24-Hour Maximum (µg/m³)[c]	150	150	47	Norfolk
Annual Arithmetic Mean (µg/m³)[g]	50	50	20	Norfolk
SO_2				
3-Hour Maximum (ppm)[c]	None	0.5	0.044	Hampton
24-Hour Maximum (ppm)[c]	0.14	None	0.015	Hampton
Annual Arithmetic Mean (ppm)	0.03	None	0.004	Hampton

Notes:
a – Source: 40 CFR 50.1-50.12.
b – Source: USEPA 2006.
c – Not to be exceeded more than once per year.
d – The 3-year average of the fourth highest daily maximum 8-hour average O_3 concentrations over each year must not exceed 0.08 ppm.
e – The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations must not exceed 15.0 g/m³.
f – The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor must not exceed 35 g/m³.
g – The 3-year average of the weighted annual mean PM_{10} concentration at each monitor within an area must not exceed 50 g/m³.
ppm = parts per million
µg/m³ = micrograms per cubic meter
NO_2 = Nitrogen dioxide

Mobile Sources

Mobile sources of concern include primarily automobiles and vehicular traffic. The primary air pollutants from mobile sources are CO, NO_x, and VOCs. Lead emissions from mobile sources have declined in recent years through the decreased use of leaded gasoline and are extremely small. Potential SO_2 and particulate emissions from mobile sources are small compared to emissions from point sources, such as power plants and industrial facilities. Although, emissions of SO_2 and particulates are relatively small, they have been included in a more detailed analysis.

Stationary Sources and Permitting Requirements

The reuse of Fort Monroe may require applications for air quality permits due to the construction and operation of new facilities at Fort Monroe. VDEQ oversees programs for permitting the construction and operation of new or modified stationary source air emissions in Virginia. Virginia air permitting is required for many industries and facilities that emit regulated pollutants. On the basis of the size of the emission units and type of pollutants emitted (criteria pollutants or hazardous air pollutants [HAP]), VDEQ sets permit rules and standards for emission sources.

Construction Permits. The air quality permitting process begins with the application for a construction permit. There are two basic types of construction permits available through the VDEQ for the construction and temporary operation of new emission sources: Prevention of Significant Deterioration (PSD) permits; and Minor New, Modified, and Certain Major Source Construction Permits (State Issued Permits). PSD permits and State Issued Permits are both part of the VDEQ Air Permit Program. Thresholds that determine the type of construction permit that may be required depend on the emissions (both quantity and type) and if the permitted source is a new source or a modification to an existing source.

- **Prevention of Significant Deterioration (PSD)**. The PSD program protects the air quality in attainment areas. PSD regulations impose limits on the amount of pollutants that major sources may emit. The PSD process would apply to all pollutants for which the region is in attainment. Sources subject to PSD are typically required to complete the following:

  – Best Available Control Technology (BACT) review for criteria pollutants;

  – Extensive predictive modeling of emissions from proposed and existing sources; and

  – Extensive public involvement.

- **State Issued Permit**. A State Issued Permit would be required to construct minor new sources, minor modifications of existing sources, and major sources not subject to PSD permit requirements. Sources subject to Minor New Source Review may be required to complete the following:

  – BACT review for each criteria pollutant;

  – Maximum Achievable Control Technology (MACT) review for regulated HAPs and designated categories;

  – Air quality analysis (predictive air dispersion modeling), upon VDEQ's request; and

  – Establish procedures for measuring and recording emissions and/or process rates.

***Operating Permits*.** Operating Permit applications are typically required within one year of operation of the sources. State Operating Permits are available through VDEQ. A Federal Operating Permit (Title V) may be required if a source is determined to be a major source.

- **State Operating Permits**. State Operating Permits are elective and may be used to obtain federally enforceable limits on criteria pollutants and HAPs below applicable major source thresholds. These "synthetic minor" sources would designate a stationary source or emission unit as a synthetic minor or area stationary source and thus be exempt from major source permitting requirements. State Operating Permits are also used to combine stationary source or emissions unit requirements under multiple permits into one permit.

- **Federal Operating Permit (Title V)**. A Title V permit would be required for major sources of criteria pollutants as defined at 40 CFR Part 70. Title V permits would be required if the annual potential to emit exceeds thresholds for criteria and HAPs. The attainment status in each AQCR determines the major source threshold criteria.

Other Regulatory Requirements. In addition to the permitting requirements to construct and operate new or modified emission sources, New Source Performance Standards (NSPS) and the National Emission Standards for HAPs (NESHAP) set emission-control standards for categories of new stationary emission sources of both criteria pollutants and HAPs.

The NSPS process requires USEPA to list categories of stationary sources that cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare. The NSPS program sets uniform emission limitations for many industrial sources. As of 11 July 2005, stationary diesel engines are subject to NSPS. Applicability to the NSPS is based on engine size and date of purchase and construction. Limitations on emissions come into effect using a tiered approach over time. Boilers with a maximum heat input of 10 million British thermal units or greater would be required to comply with NSPS.

The CAA Amendments of 1990, under revisions to section 112, required USEPA to list and promulgate NESHAPs to reduce the emissions of HAPs, such as formaldehyde, benzene, xylene, and toluene from categories of major and area sources (40 CFR Part 63). New stationary sources whose potential to emit HAPs exceeds either 10 tpy of a single HAP, or 25 tpy of all regulated HAPs would be subject to MACT requirements.

The construction projects would be accomplished in full compliance with current and pending Virginia regulatory requirements, through the use of compliant practices and/or products. These requirements appear in 9 Virginia Administrative Code 5 Chapter 60 of the Virginia Air Quality Regulations.

Currently, Fort Monroe maintains a Stationary Source Permit to Operate as a Synthetic Minor (Registration No. 60336) in compliance with VDEQ regulations. Existing air emission sources at Fort Monroe include stationary boilers and radiant heaters, emergency diesel engines, and emergency natural gas-fired engines. Fort Monroe cannot emit more than 50.3 tpy of NO_x and 11 tpy of VOCs. Generators cannot operate more than 500 hours per year per generator and are tracked on a monthly basis. Table 4.4-4 lists the emissions for 2005, summarized from the

2005 Emissions Inventory. Fort Monroe must keep records of the amount of fuel used and provide information to VDEQ on how much VOC and NO_x are emitted on a monthly basis from the entire facility. Fort Monroe submits an annual report to VDEQ in February each year as required by their permit. Vehicle emissions were estimated using the Urban Emissions (URBEMIS) Version 9.2, which is an air emissions modeling software.

Table 4.4-4 Fort Monroe Air Emissions in Tons per Year (TPY)

Source Type	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO	VOC
Direct Emissions						
Point Sources(1)	3.34	0.24	0.26	0.26	2.64	4.60
Area Sources (Landscaping, Consumer Products, Painting)(2)	1.73	0.04	2.08	2.01	16.2	8.98
Indirect Emissions						
Employee Commuting, Deliveries(2)	36.65	0.2	37.46	7.33	302.02	25.06
Total	**41.72**	**0.48**	**39.8**	**9.6**	**320.86**	**38.64**

(1) VDEQ 2005 Emissions Inventory
(2) URBEMIS Model Version 9.2

4.4.2 Consequences

Reuse projects could affect air quality in three ways: by generating pollutants during limited demolition and construction; by introducing new stationary sources of pollutants, such as heating boilers and standby generators; and through changes in vehicular traffic that could raise vehicle emission levels locally and possibly regionally. Air quality effects would be considered minor to moderate unless the estimated emissions would not conform to the SIP or would contribute to a violation of any federal, state, or local air regulations.

All direct sources of air emissions that are reasonably foreseeable were estimated. Direct emissions are emissions that would be caused by the reuse of Fort Monroe and occur at the same time and place as the reuse. Indirect emissions are defined as reasonably foreseeable emissions that would be caused by the reuse, but that may occur later in time or be farther removed in distance from the reuse itself. More specifically, project-related direct and indirect emissions would result from the following:

- **Demolition and construction activities** — Use of construction equipment, worker vehicles (e.g., bulldozers and backhoes), VOC paints, and paving off-gasses; and

- **Operational activities** — Use of emergency generators, small heating boilers, and private motor vehicles.

The USEPA established *de minimis* levels to preclude federal actions from the requirements to provide a General Conformity Determination (GCD) and would not impede an area's ability to attain the NAAQS. The applicability levels for precursors to O_3 within the Hampton Roads Area were compared to the greatest annual project related emissions for each of the reuse alternatives. In addition, action-related (project-related) emissions are determined to be regionally significant if the emission level represents 10 percent or more of the regional total emissions for which the area is in maintenance.

Future vehicle exhaust emissions will be less in the year 2031 as compared to baseline levels (as predicted in the URBEMIS model), as a result of older vehicles retiring from local roadways and being replaced by newer, more fuel-efficient vehicles having much lower levels of exhaust in 2031 than cars on the road in 2005, leading to a net decrease in exhaust emissions. This effect is also predicted to occur relative to diesel emissions from construction vehicles.

4.4.2.1 Early Transfer Disposal Alternative

Direct. Minor short-term adverse effects would be expected. Exhaust emissions associated with construction and renovation vehicles, VOC emissions from paints, and paving off-gasses would be expected and largely unavoidable. The USEPA General Conformity Rule requires a formal conformity determination document for federal actions occurring in NAA though transfers of ownership and leases for similar activities are exempt from the General Conformity Rule. Since the Army's proposed action will involve the sale or other title transfer of non-reverting property and similar uses would occur, it has been determined that the action is exempt from the General Conformity Rule requirement to prepare a full GCD. Therefore, a Record of Non-Applicability was prepared and is presented in Appendix C. In any event, for the purposes of NEPA compliance, this EIS includes a detailed assessment of air emissions relative to *de minimis* thresholds resulting from redevelopment, as well as mitigation measures to reduce emissions. The results of this analysis are presented in Sections 4.4.2.5 and 4.15.

Indirect. No effects would be expected to occur.

4.4.2.2 Traditional Disposal Alternative

Direct. Minor short-term adverse effects would be expected, similar to the early transfer alternative.

Indirect. No effects would be expected to occur.

4.4.2.3 Caretaker Status Alternative

Direct. Long-term minor beneficial effects would be expected. Residential and vehicle emissions would cease as residents relocated from the military housing.

Indirect. No effects would be expected.

4.4.2.4 No Action Alternative

No direct or indirect effects would be expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC

Commission's recommendations for closure. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.4.2.5 Intensity-Based Probable Use Scenario

Lower Bracket, Direct. Implementing the Lower Bracket scenario is expected to have short-term minor adverse effects to air quality and long-term minor benefits to air quality due to decreased activities on-site relative to baseline conditions. Overall, emissions would conform to the SIP, and applicable federal, state, or local air regulations. Demolition and minor construction emissions associated with using construction equipment (e.g., bulldozers, backhoes), worker vehicles, using VOC paints, and paving off-gasses are tabulated below for all the years of construction (Table 4.4-5).

Table 4.4-5 Estimated Construction Emissions – Lower Bracket Scenario

Year	Demolition and Construction(1) Emissions (tpy)	
	VOC	NO_x
2012	5.4	29.2
2013	5.1	27.2
2014	4.7	25.1
2015	4.4	23.0
2016	4.1	21.2
2017	3.7	19.3
2018	3.5	17.7
2019	3.2	16.2
2020	3.0	14.8
2021	2.6	13.9
2022	2.5	13.8
2023	2.5	13.8
2024	2.6	13.9
2025	2.6	13.9
2026	2.3	13.4
2027	2.3	13.4
2028	2.3	13.3
2029	2.3	13.4
2030	2.3	13.4
Exceeds Threshold:	**No**	**No**

(1) Demolition, site grading, and construction are expected to occur in 2012 through 2030.
Source: URBEMIS Version 9.2.4. Off-Road emission factors: OFFROAD2007 Model
On-Road emission factors: Emfac2007 V2.3

Table 4.4-6 presents the estimated decrease in emissions with the Lower Bracket scenario for all sources, in comparison to thresholds. Emissions due to residential and tourism traffic from

the Lower Bracket reuse scenario are accounted for in Table 4.4-6 and show that this scenario would result in decreased emissions as compared to baseline conditions.

Table 4.4-6 Estimated Total Annual Emissions – Lower Bracket Scenario

Year	Future Annual Emissions (tpy)	
	VOC	NO_x
2031 (and after)	8.79	4.72
Baseline	38.64	41.72
Exceeds Threshold:	**No**	**No**
Source: URBEMIS Version 9.2.4. Off-Road emission factors: OFFROAD2007 Model On-Road emission factors: Emfac2007 V2.3		

Lower Bracket, Indirect. Minor beneficial impacts are expected.

Middle Bracket, Direct. Implementing the Middle Bracket scenario would be expected to create both short-term and long-term minor adverse effects to air quality. Overall, increases in emissions would conform to the SIP, and applicable federal, state, or local air regulations. The planning activities associated with the reuse under this scenario would generate some additional residences and businesses. The housing and office space would create additional air emissions due to the increase in vehicle emissions and residential emissions (heating, home chemical products), which are largely unavoidable. Nonetheless, increases in emissions would conform to the SIP and would not contribute to a violation of any federal, state, or local air regulations. Potential mitigation that may be used to reduce these effects is outlined in Section 4.15.

Demolition and construction emissions associated with using construction equipment (e.g., bulldozers and backhoes), worker vehicles, and VOC paints, and paving off-gasses are tabulated below for all the years of construction (Table 4.4-7)..

Table 4.4-7 Estimated Construction Emissions – Middle Bracket Scenario

Year	Demolition and Construction[(1)] Emissions (tpy)	
	VOC	NO_x
2012	3.87	23.58
2013	3.63	21.93
2014	3.37	20.24
2015	3.12	18.51
2016	2.91	16.96
2017	2.69	15.42
2018	2.49	14.12

2019	2.33	12.89
2020	2.17	11.82
2021	1.91	11.12
2022	1.90	11.08
2023	1.90	11.08
2024	1.92	11.16
2025	1.91	11.12
2026	1.78	10.81
2027	1.78	10.81
2028	1.78	10.81
2029	1.77	10.77
2030	1.78	10.81
Exceeds Threshold:	**No**	**No**

(1) Demolition, site grading, and construction are expected to occur from 2012 through 2030.
Source: URBEMIS Version 9.2.4. Off-Road emission factors: OFFROAD2007 Model
On-Road emission factors: Emfac2007 V2.3

Table 4.4-8 presents the estimated increase in emissions with the Middle Bracket scenario for all sources, in comparison to thresholds. Emissions due to additional tourist, residential, and commercial traffic due to the Middle Bracket reuse scenario are accounted for in Table 4.4-8.

Table 4.4-8 Estimated Total Annual Emissions – Middle Bracket Scenario

Year	Future Annual Emissions (tpy)	
	VOC	NO_x
2031 (and after)	40.47	19.10
Baseline	38.64	41.72
Project-related Change	1.83	-22.62
Exceeds Threshold:	**No**	**No**

Source: URBEMIS Version 9.2.4. Off-Road emission factors: OFFROAD2007 Model. On-Road emission factors: Emfac2007 V2.3

Middle Bracket, Indirect. Minor adverse impacts are expected.

Upper Bracket, Direct. Implementing the Upper Bracket scenario would be expected to produce both short-term and long-term minor adverse effects to air quality, similar to those described for the Middle Bracket scenario. Overall, increases in emissions would conform to the

SIP, and applicable federal, state, or local air regulations (see Section 4.15 for mitigation strategies).

Demolition and construction emissions associated with using construction equipment (e.g., bulldozers and backhoes), worker vehicles, and VOC paints, and paving off-gasses are tabulated below for all the years of construction (Table 4.4-9). Project-related emissions are those emissions that would occur from reuse when compared to the emissions that would occur without reuse (the net change in emission level).

Table 4.4-9 Estimated Construction Emissions – Upper Bracket Scenario

Year	Demolition and Construction(1) Emissions (tpy)	
	VOC	NO_x
2012	3.96	24.51
2013	3.71	22.75
2014	3.45	20.97
2015	3.19	19.15
2016	2.97	17.52
2017	2.75	15.92
2018	2.55	14.57
2019	2.37	13.29
2020	2.21	12.18
2021	1.94	11.37
2022	1.93	11.32
2023	1.93	11.32
2024	1.95	11.41
2025	1.94	11.37
2026	1.80	11.02
2027	1.80	11.02
2028	1.80	10.97
2029	1.80	11.02
2030	1.80	11.02
Exceeds Threshold	**No**	**No**

(1) Demolition, site grading, and construction are expected to occur from 2012 through 2030.
Source: URBEMIS Version 9.2.4. Off-Road emission factors: OFFROAD2007 Model
On-Road emission factors: Emfac2007 V2.3

Table 4.4-10 presents the estimated increase in all emission sources for the Upper Bracket scenario. Emissions due to additional tourist, residential, commercial traffic in the Upper Bracket reuse scenario are accounted for in Table 4.4-10 and show that this scenario would result in emission increases of VOC.

Table 4.4-10 Estimated Total Annual Emissions – Upper Bracket Scenario

Year	Future Annual Emissions (tpy)	
	VOC	NO_x
2031 (and after)	47.28	22.66
Baseline	38.64	41.72
Project-Related Change	8.64	-19.06
Exceeds Threshold	**No**	**No**
Source: URBEMIS Version 9.2.4. Off-Road emission factors: OFFROAD2007 Model On-Road emission factors: Emfac2007 V2.3		

The emissions of all pollutants for this scenario are less than the applicability thresholds. Thus, even if the action was not exempt, a GCD would not be required.

Upper Bracket, Indirect. Minor adverse impacts are expected.

4.5 NOISE

4.5.1 Affected Environment

4.5.1.1 Noise Measures and Standards

The term “noise” is usually reserved for unwanted sounds made by people and machines that are considered to be “loud” by the listener. To estimate the loudness of sounds, the USEPA recommends measuring sound with A-weighting. A-weighting refers to a specific scale on the sound level meter which weights sounds of different frequencies (referred to as Hertz or Hz) according to their relative detectability by the human ear. For a broad range of sounds, A-weighting provides a simple approximation of their relative loudness (USEPA 1973, 1974).

Because the human ear can detect sound vibrations on a scale of 1 to 10^{12}, sounds are measured on a logarithmic scale rather than a linear scale. The unit of measure for noise impacts is the decibel (dB) which is a measure of sound pressure change created by vibrations from a source. Table 4.5-1 provides examples of the range of noise levels associated with different commonly encountered sources of noise. Because sound is measured on a log base 10 scale, doubling sound intensity only increases the decibel levels by 3 dB (e.g., doubling a 60 dB sound, only increases the measure to 63 dB). A 10 fold increase in sound intensity (1,000 percent increase), increases the decibel measure by 10. Also it is important to note that the human ear has difficulty perceiving the doubling of sound, because of its large range. So, if a sound is currently at 60 dB and the intensity is doubled to 63 dB (60 dB + 3dB), this only represents an increase in the actual intensity (power) of the sound of 0.0002 percent over the entire range of the human ear. Such a change in sound intensity may be imperceptible in certain conditions (USEPA 1973, 1974). Thus, USEPA indicates that increased sound levels less than 5 dB are generally not considered significant (USEPA 1973, 1974).

The numbers in Table 4.5-1 represent the decibel values at the distance from the sources at which they are typically heard, and without knowing the exact distance between a sound source and a measurement microphone, it is not possible to compare the noise levels of different sources. Thus, when comparing the noise of trucks, a standard distance is 50 feet to the side of the truck. For a single stationary source, such as a chain saw, the value can be expected to decrease by 6 dB for every doubling of distance from the source. When a number of sound generators are set up in a line, such as traffic on a busy highway, the source is described as a “line source.” For a perfect line source, measured decibels decrease by 3 dB for every doubling of distance. In real life, highways are not perfect line sources, and a more typical decrease with distance is 4 dB for every doubling of distance from the highway.

Table 4.5-1 Decibel Levels of Common Sources of Noise (USEPA 1974)

Source	Decibels															
	40		50		60		70		80		90		100		110	
Chain Saw																
Snowmobile																
Diesel Train																
Heavy Truck																
Motorcycle																
Lawnmower																
Subway																
Motorboat																
Passenger Train																
Food Disposer																
Car																
Power Tools																
Food Blender																
Vacuum Cleaner																
Air Conditioner																
Clothes Dryer																
Washing Machine																
Refrigerator																

Sound at different frequencies is attenuated by the atmosphere, barriers, and vegetation. These variables combine to attenuate the intensity of high frequency sound more efficiently than low frequency sound. Thus, a busy highway, such as I-64 which lies approximately 0.3 miles from Fort Monroe, can be heard as a rumbling low frequency background sound superimposed on the natural sound environment.

Overall, the principal factors that can affect the perception of increased noise and annoyance include:

- Climatic conditions (e.g., increased temperature decreases air pressure which lowers sound propagation and lowers noise intensity, while colder air increases noise intensity; winds can reduce or increase sound intensity depending on direction; clouds can reflect sound and increase propagation);

- Time of day (e.g., night time noise is considered more annoying than day time noise levels);

- Distance from the noise source to the receptor (e.g., traffic noise decreases by 4 dB as the distance between the receptor and the source doubles [USEPA 1974]);

- Sound characteristics (e.g., pulse, vibration, and continuous sounds can create different human responses, even when the average A-weighted levels are the same);

- Multiple noise sources (e.g., noise sources are not additive on the logarithmic scale, so the effect of two 60 dB noise sources, is not 120 dB, but rather 63 dB);

- Frequency of the sound (e.g., the human ear does not have the ability to detect sounds to the same degree at different frequencies as previously discussed);

- Site history (new sources may be more noticeable and annoying than more commonly encountered noises); and

- Personal characteristics (e.g., hearing ability, tolerance to noise).

When the USEPA first studied noise issues in the U.S. in 1973, its experts addressed both health and welfare concerns. At the highest dB levels, noise can damage health by causing hearing loss. At dB levels which are insufficient to cause hearing loss, noise can degrade welfare through sleep disturbance, distraction from daily tasks in the workplace or disturbance in the quiet of the home. One of USEPA's important conclusions was that the effects of noise on both health and welfare can be evaluated by combining the cumulative effects of different sounds into a measure known as the equivalent sound level (abbreviated as LEQ or L_{EQ}). Prior to USEPA's involvement, experts concerned with the effects of noise on U.S. citizens used different mathematical procedures for predicting hearing loss in the workplace and predicting the effects of noise on communities. The USEPA demonstrated that the L_{EQ} metric can be used for both purposes.

A decibel value for L_{EQ} is meaningless without specification of the time period covered. For predicting hearing loss in the workplace, the time period is usually 8 hours. For predicting the annoyance of noise in the community, the time period is usually 24 hours. For a given period with all sounds at the same level, the L_{EQ} increases by 3 dB for every doubling of the number of sounds. For evaluations of annoyance, most researchers have found that the relative annoyance also increases by 3 dB for every doubling of the number of sounds. In reality, "noise" consists of sounds at many different intensities during a specified exposure period, and so the L_{EQ} is based on a time-weighted average.

For community noise assessments, the USEPA recommends that an A-weighted, time-weighted, 24-hour L_{EQ} known as the "day-night average sound level" (DNL) be used to assess sound exposure. A special feature of DNL is that it treats sounds occurring between 10:00 PM and 7:00 AM as being 10 dB greater than their measured levels. This 10 dB "nighttime penalty" is intended to compensate for the extra annoyance of sounds experienced when people are at home during the evening and night, and most research tends to confirm the utility of this penalty. This penalty does not, however, predict sleep disturbance.

Army policy declares areas where the DNL is below 65 dB, and/or daytime L_{EQ} is below 65 dB and the nighttime L_{EQ} is below 55 dB, are acceptable for all types of noise-sensitive land uses such as homes, schools, medical facilities, and churches (U.S. Army 2007b). This policy applies to unwanted sound from aircraft, highways, generators, and any other continuous noise sources. For comparison, the Federal Aviation Administration has also established a significance threshold of 65 dB for residential areas for NEPA documents pertaining to airport

construction projects (U.S. Department of Transportation 2006). For traffic noise, the Federal Highway Administration (FHWA) also provides guidelines for states for setting traffic noise thresholds (USFHWA 2008). The VDOT has adopted the FHWA noise abatement criteria (67 dB to 72 dB depending on land use) for road projects. According to VDOT policy, a "substantial" change in traffic noise is defined to be greater than or equal to 10 dB for the purposes of determining noise abatement requirements for road projects (VDOT 2009). USEPA also indicates that increased sound levels less than 5 dB are generally not considered significant (USEPA 1973, 1974). These thresholds were considered when characterizing current and future noise impacts at Fort Monroe and the surrounding community.

4.5.1.2 Noise Measurements at Fort Monroe

In 1984, the U.S. Army Environmental Hygiene Agency (USAEHA) conducted a noise measurement field study to define the affected noise environment at Fort Monroe (USAEHA 1984). Although this noise study conducted 25 years ago, it provides the most recently available noise monitoring data for characterizing baseline conditions at Fort Monroe. An analysis of the original field data and supporting records from this study were reviewed and evaluated for their appropriateness for characterizing current baseline noise conditions at Fort Monroe. This analysis was conducted by Dr. George Luz who was the former Director of the Army noise program at U.S. Army Center for Health Promotion and Preventive Medicine from 1975 to 2003.

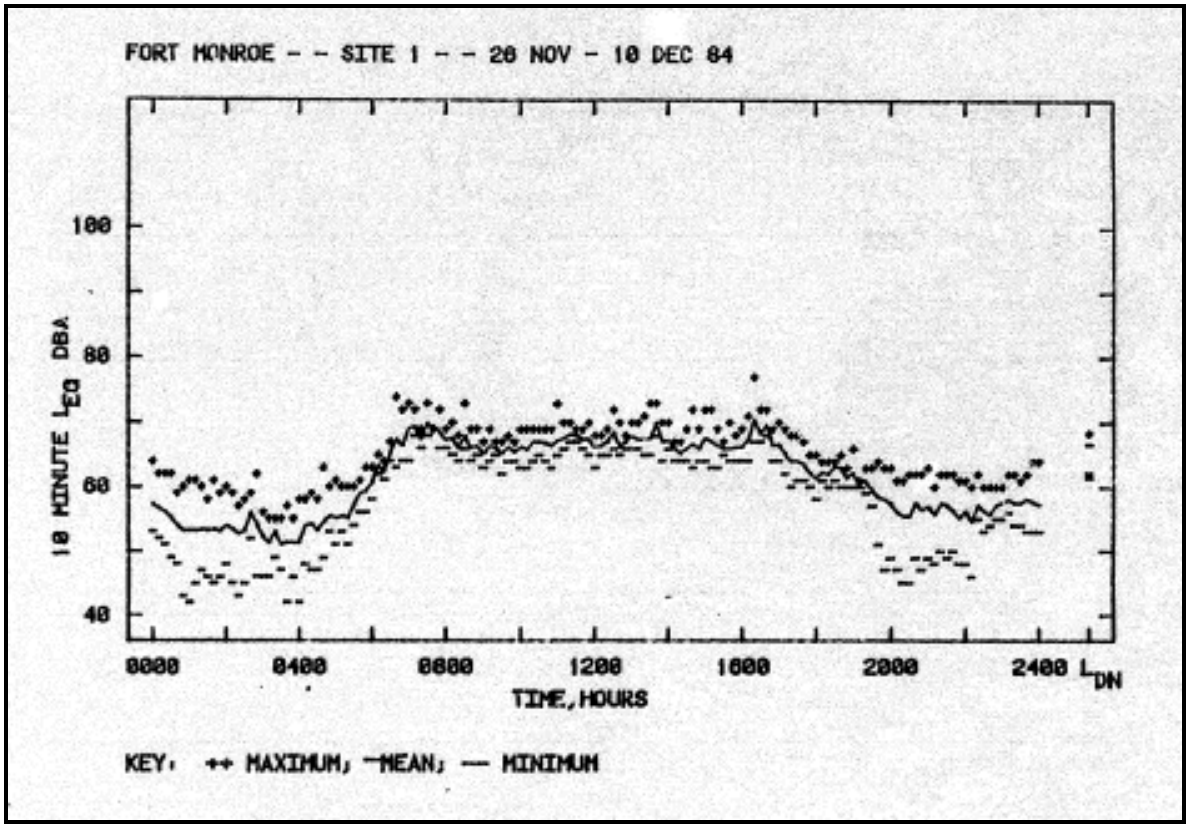
The USAEHA noise study demonstrated that the dominant noise source across the installation was road traffic. In the intervening years, there have been two changes in the noise emissions from road traffic in the Hampton Roads area. First, the volume of traffic on the busiest artery, I-64, has increased. Second, the noise emissions of individual vehicles have decreased as a result of improved vehicle design and increased fuel efficiency. Since I-64 was already carrying a high level of traffic in 1984, the increase in noise level from subsequent increases in volume is small, and any increase in overall noise level has probably been countered by a decrease in the noise level of individual vehicles (USAEHA 1984). Following this logic, the USAEHA noise measurements made in 1984 are assumed to be representative of the noise levels currently experienced at Fort Monroe. A detailed description of the noise metrics and results of this study are presented in Appendix D.

The USAEHA designed their study to capture both the highest traffic noise levels along the water's edge and the more typical levels at the interior of the installations. The map in Figure 4.5-1 shows the location of the USAEHA measurement sites on Fort Monroe. Sites 1 and 2 were located to register sound propagated over the water from I-64. Monitors at Sites 3, 4, and 5 were located to register the noise reduction from buildings. Site 4, which was located inside the walls of the fort, was intended to capture the barrier effect of the enclosure (USAEHA 1984).

Source: USAEHA 1984

Figure 4.5-1 Traffic Noise Measurement Sites From the 1984 USAEHA Study

The DNL during the period 26 November to 10 December 1984 was 67.7 dB at Site 1, 66.5 dB at Site 2, 65.2 dB at Site 3, 61.9 dB at Site 4, and 65.2 dB at Site 5. The 24-hour pattern of traffic noise is best illustrated in Figure 4.5-2, which is reproduced from Figure C.1 of the USAEHA report (USAEHA 1984). An important feature in Figure 4.5-2 is the rather small difference between the minimum and maximum 10 minute LEQ data between 5:30 AM and 6:00 PM. During the day, traffic flow is relatively constant, and the sound level propagating toward Fort Monroe is also relatively constant. During the evening and night, the variability of sound propagation increases. This increased variability translates into a larger difference between the minimum and maximum 10 minute LEQ data during the evening and night than during the day (USAEHA 1984).



Source: USAEHA 1984 (Note: The solid line is the average LEQ with the minimum shown by dashed lines [generally below the solid line] and the maximum by crosses [generally above the solid line])

Figure 4.5-2 Variation in Noise Levels on the Shore of Fort Monroe and Directly Across the Water from I-64

In addition to the monitoring study, a soundscape survey was conducted on 4-5 December 2008 by Dr. George Luz. The objectives of this study were principally to evaluate and confirm the sources of noise identified in the 1984 noise study, evaluate the environmental setting and principal factors that may impact noise, and to qualitatively evaluate the differences in noise levels at the sampling locations used in the 1984 study. Additional noise monitoring was not conducted as part of the soundscape study. Because the concept of a *soundscape survey* is relatively new, a brief explanation is provided here. In a soundscape survey, the evaluator listens to the sounds in order to sort out the various sources contributing to the A-weighted LEQ. The soundscape survey established that the audibility of noise depends on the weather. During the survey, Fort Monroe was either crosswind or upwind from I-64 (downwind, which would usually be associated with the highest sound levels from I-64, did not occur during the two-day survey). At Dock H (near noise measurement Site 1) on the western shore of the installation, traffic noise was always audible and, as expected, louder in crosswind than in upwind conditions. The omnipresent traffic noise was consistent with the pattern reported by the USAEHA for their Sites 1 and 2, which were on the western edge of Fort Monroe (see Appendix

D). Farther into the installation, traffic noise was not as loud but still audible under crosswind conditions at Battery DeRussy on the eastern edge. With upwind conditions, a distant rumble of traffic noise was barely audible at Battery DeRussy. At that site, the most dominant sounds were from aircraft operations – some from the north and some from the south. Presumably, these operations were from Langley AFB and Norfolk International Airport, respectively.

Aesthetically, one of the most important sites at Fort Monroe is the historic interior of the original fort. Subjectively, this interior was the quietest place on the installation (located in the vicinity of noise measurement Site 4). In the USAEHA measurement study, noise levels in the interior were about 5 dB less than at the western edge. During crosswind conditions, traffic noise was undetectable at a number of locations inside the walls but remained audible at the center of the parade ground. During upwind conditions, traffic noise was not audible anywhere inside the walls. Were it not for the occasional flights of jet aircraft, the soundscape within the walls would be relatively pristine. The high walls of the original fort also provide shielding to the General Officers' quarters along the south edge. At the same time, the south edge receives noise propagated over water from Little Creek Naval Amphibious Base in Norfolk. During the late afternoon of 4 December 2008, helicopter noise from the Little Creek Naval Amphibious Base was particularly noticeable. At that time, Fort Monroe was downwind from the Little Creek Naval Amphibious Base.

As previously discussed, Army Regulation 200-1 considers an area suitable for residential use if the DNL does not exceed 65 dB. In the USAEHA study, two of the sites averaged a DNL of 65.2 dB, slightly above this threshold but within the margin of statistical error. Given that the time of year for the USAEHA study (November – December) favors the propagation of sound, it is probable that the annual DNL at these two USAEHA sites would have been below 65 dB if it had been measured throughout the year. Relative to baseline conditions only residential areas close to the western edge of the installation would be considered "normally incompatible" under Army planning guidelines for residential use. In any event, these noise levels are fairly typical of residential areas located in urban settings. USEPA (1974) estimated that approximately a quarter of the entire U.S. urban population lives in areas with similar or higher noise levels as Fort Monroe. Although these noise levels are fairly typical of an urban setting, they are slightly higher than what would be expected based on population density and traffic alone, as military flight operations also contribute to regional background noise levels in the Norfolk area (i.e., discussed further in Section 4.5.1.3).

In addition to field measured noise levels, average ambient noise was modeled based on weekday population density on Fort Monroe which includes employment and residential usage under baseline conditions. The USEPA equation below was used to estimate DNL based on population density in an urban or suburban area. This equation is:

$$DNL = 10 \log_{(\text{base } 10)} (\text{population per square mile}) + 22 \text{ (dB) (USEPA 1974).}$$

Using this equation, the average estimated DNL for Fort Monroe is 62 dB, which is 3 dB below the average DNL measured from the USAEHA study (1984) of 65 dB. It should be noted; however, that the USEPA equation does not include the contribution of local aircraft noise which is found at Fort Monroe due to the close proximity of two large military airfields and a

commercial international airport, as further discussed in Section 4.5.1.3. Thus, the difference between the measured baseline conditions and modeled baseline noise levels (i.e., 3 dB) may be associated in part with aircraft operations.

4.5.1.3 Aircraft Noise

Fort Monroe is located approximately 10 miles northwest of the Norfolk International Airport, 4 miles south of Langley AFB, and 20 miles northwest of the NAS Oceana. Military and commercial aircraft operating from these nearby airfields contribute to the background noise levels at Fort Monroe and nearby communities, such as Phoebus. The fact that estimated noise levels using the USEPA (1974) model are 3 dB below actual field measured levels of noise at Fort Monroe, suggests that the addition of nearby aircraft flight operations may be partly responsible for the difference (as previously discussed). Anecdotal results of the soundscape survey further supports this conclusion.

4.5.1.4 Sensitive Receptors

Sensitive receptors on Fort Monroe include a church (i.e., Saint Mary's Star of the Sea Catholic Church), residential areas, and medical facilities and offices (e.g., Craven Army Health Clinic, Fort Monroe Dental Clinic).

Fort Monroe is bounded by developed areas to the north and west. Sensitive receptors in the nearby community of Phoebus that are located near principal access routes to Fort Monroe include churches and chapels (e.g., Phoebus United Methodist Church, Open Door Baptist Church, Center of Hope Full Gospel Church, Bibleway Baptist Church, Zion Baptist Church, and First Apostolic Church), residential areas, schools (e.g., Saint Mary Star of the Sea School, Hampton University, Jane H. Bryan Elementary School, Moton Early Childhood Center), and medical facilities and offices (e.g., Hampton Veterans Administration Medical Center).

4.5.1.5 Noise Levels in Nearby Communities

Fort Monroe is bounded by residential and commercial areas to the north and west. The USEPA noise model, previously discussed, was used to estimate ambient background noise for nearby communities (i.e., Phoebus). Using the USEPA equation and estimates of population density for Phoebus (using statistics from the U.S. Census Bureau [2005] for the City of Hampton and residential density estimates for Phoebus), the estimated DNL for the community of Phoebus is calculated to be 62 dB. This noise level is the same as the baseline noise level modeled for Fort Monroe using the USEPA equation. Since the model estimates for Phoebus do not include nearby aircraft noise impacts (as was the case for Fort Monroe), it is possible that noise levels are slightly higher than 62 dB. Considering the 3 dB difference found between modeled baseline estimates of noise on Fort Monroe (using the same modeling method above) and actual field measurements, it is possible that DNL levels in Phoebus are approximately 65 dB. The City of Hampton has not adopted a generally applicable noise threshold for residential areas.

4.5.2 Consequences

4.5.2.1 Early Transfer Disposal Alternative

Direct. In the long-term, minor to moderate adverse effects associated with noise would be expected from early transfer and disposal of Fort Monroe. Changes in noise levels were

evaluated along roads and within residential areas of Fort Monroe and Phoebus based on an analysis of increased residential intensity and tourism on Fort Monroe, building metrics from Table 3.3-3, estimated changes in traffic volume from reuse, and noise modeling (discussed in further detail in Section 4.5.2.5). Following transfer of Fort Monroe and reuse, average noise levels are expected to increase by less than 5 dB in Phoebus and on Fort Monroe, resulting in average noise levels (i.e., DNL) ranging from the low 60s dB to just below 70 dB (discussed further below). Even with increased traffic, these noise levels are fairly typical of urban residential areas. USEPA (1974) estimated that approximately a quarter of the entire U.S. urban population lives in areas with noise levels above 63 dB. Furthermore, the increase in average noise levels on Fort Monroe (i.e., DNL) is estimated to be below 5 dB, which USEPA generally considers a minor change in noise (USEPA 1973, 1974).

Overall, the noise impact ranges from minor to moderate depending on the location of the receptor and stage of redevelopment. In the short-term, early transfer will result in only minor changes to noise levels depending on the stage of redevelopment and proximity of receptors to major roads that access Fort Monroe. As early transfer allows for quicker implementation of the Reuse Plan, the resulting increased traffic from residential development and tourism will ultimately result in traffic volumes that begin to exceed current conditions, resulting in initially minor adverse effects on noise in Phoebus and on Front Monroe. In the long-term at full build out (20 years), transfer of Fort Monroe will result in average noise levels ranging from 65 dB to 70 dB along major roads in Phoebus (e.g., Mercury Boulevard and Mellen Street) and on Fort Monroe depending on the reuse scenario and associated traffic generation.

Peak noise levels are not expected to change during the morning commute period relative to baseline conditions, but may increase during the evening commute and weekend periods along major access roads through Phoebus and Fort Monroe. Peak commuter traffic noise levels may increase by 1 to 9 dB along these roads. This change in peak traffic volume falls below the VDOT and FHWA's definition of a "substantial" change in peak noise levels (USFHWA 2008, VDOT 2009).

Increased recreational motor boat usage will contribute to increased noise levels along the coastal area. Marina expansion may include the addition of up to 100 more boats (as discussed in Section 3.3.5), although many of these will be sailboats. In any event, vehicular traffic is by far the principal noise concern given the volume of vehicular traffic and proximity to the receptor.

Indirect. Long-term minor adverse effects would be expected. Regional economic and population growth generated from redevelopment, as well as increased commuter and tourism traffic to Fort Monroe will increase traffic volumes along existing regional roadways. This increase in regional traffic will slightly increase associated traffic noise on these roads.

4.5.2.2 Traditional Disposal Alternative

Direct. Minor to moderate long-term adverse effects, similar to those described under the early transfer disposal alternative, would be expected. However, these effects would occur farther into the future.

Indirect. Minor long-term adverse effects, similar to those under the early transfer disposal alternative, would be expected. However, these effects would occur farther into the future.

4.5.2.3 Caretaker Status Alternative

Direct. Moderate beneficial effects would be expected. Under this alternative, military missions would cease at Fort Monroe. Gate traffic at Fort Monroe would decrease from 10,500 trips per day to a small fraction of trips for security and maintenance functions. Thus, caretaker status will drop Fort Monroe gate traffic and reduce traffic in Phoebus, resulting in a drop in the traffic related noise levels for both Phoebus and Fort Monroe.

Indirect. Minor beneficial effects would be expected. Employee levels at Fort Monroe would be reduced to a fraction of fully operational levels under the caretaker alternative and would result in fewer commuter vehicle trips in the region. Accordingly, traffic noise levels on regional public roads serving Fort Monroe would also be reduced.

4.5.2.4 No Action Alternative

No direct or indirect effects would be expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.5.2.5 Intensity-Based Probable Use Scenario

Changes in noise levels were modeled for Phoebus and Fort Monroe based on an analysis of increased residential intensity and tourism on Fort Monroe, changes in population density, building metrics from Table 3.3-3, and estimated changes in traffic volume from reuse (see Section 4.11 and Appendix H for details). For estimating the change in noise along individual road segments, the results of the transportation modeling effort, outlined in detail in Section 4.11 and Appendix H, were used to estimate the change in noise during weekday peak hour traffic and Saturday traffic along the road network within Phoebus and the main gate of Fort Monroe. The increase in peak traffic noise generated from reuse can be estimated directly from the change in traffic volume using the following equation:

$$\text{Decibel increase} = 10 * \log_{\text{base } 10}([\text{Traffic in 2005} + \text{New Traffic}]/\text{Traffic in 2005})$$

It is assumed that the type of traffic mixes (proportion of cars and trucks) for 2005 and for the new traffic are roughly the same. The results of this analysis are presented in Table 4.5-2.

Table 4.5-2 Change in Traffic Noise from Baseline Conditions to Implementation of the Reuse Plan at Full Build-out (Middle Bracket Scenario)

Road	Road Segment Between the Following Roads	Change in Peak Traffic Noise Levels (dB)		
		Peak Weekday AM	Peak Weekday PM	Peak Saturday Traffic
Mallory	I-64 and County	0.1	1.0	1.8
Mallory	County and Mercury	0.1	0.6	1.0
Mellen	Mallory and Mercury	-1.9	3.8	8.7
Mercury	Mellen and Mallory	-0.4	4.6	9.2
Mercury	Mallory and Woodland	-0.5	4.3	8.0
Woodland	I-64 and County	0.0	1.1	2.7
Woodland	County and Mercury	0.0	1.1	2.7
County	Mallory and Woodland	0.2	1.4	3.6
Fort Monroe Gate		-1.3	4.2	9.0

In addition to the road networks, average noise levels were estimated for each reuse scenario based on an analysis of increased residential density and tourism on the lower portion of Fort Monroe, and building metrics from Table 3.3-3. Average ambient noise was modeled using the USEPA (1974) equation previously discussed based on weekday population density on Fort Monroe in the lower fort area estimated for each reuse scenario, which includes residential usage, employment projections, and tourism (derived from Table 3.3-3 and tourism visitation numbers discussed in Appendix H).

Estimated noise levels were then calibrated to Fort Monroe using the results of the field measured data. As previously discussed, average field measured noise levels on Fort Monroe under baseline conditions were estimated to be approximately 3 dB higher than modeled values using the USEPA equation and assumptions regarding baseline population density. This difference in baseline conditions between modeled and field measured noise levels is considered to be due in part to aircraft related noise contributions (as the model above does not directly address the increased noise associated with nearby aircraft operations). On the other hand, it is possible that the measured values are artificially high (and the model results are more accurate) because climatic conditions during the period of the field survey favored higher noise measurements (as previously discussed). In any event, to be conservative and to calibrate the model to baseline conditions, 3 dB was added to modeled baseline conditions and each of the reuse scenarios to account for aircraft noise. The results of the noise modeling are presented in Table 4.5-3 and further discussed below.

Table 4.5-3 Change in Average DNL at Fort Monroe from Baseline Conditions to Implementation of the Reuse Plan at Full Build-out for Each Reuse Scenario

Metric	Average Field Measured Noise	Calibrated Baseline Modeled Noise	Modeled Noise Results for Reuse Scenarios		
			Lower Bracket	Middle Bracket	Upper Bracket
Average DNL	65 db	65 dB	61.5 dB	68.6 dB	69.5 dB
Net Change			-3.5 dB	+3.6 dB	+4.5 dB

Lower Bracket, Direct. Short- and long-term minor beneficial effects would be expected. Development and operational activities responsible for noise generation would be fewer and less intense than current baseline conditions based on reduced traffic volumes for the Lower Bracket scenario (see Table 4.5-3). Gate traffic accessing Fort Monroe would be approximately half of its current volume (10,500 trips), which will result in reduced traffic volumes throughout the major roads in Phoebus (e.g., particularly Mellen Street and Mercury Boulevard). Reduced traffic along these roads will result in a minor reduction in noise levels in Phoebus. Although, weekend traffic may increase slightly above weekend baseline conditions, the projected weekend volumes will still be below baseline peak weekday traffic conditions. Thus, traffic related noise during peak tourism periods on the weekend may result in a minor increase in noise levels along major roads in Phoebus, but not above the noise levels experienced currently on weekdays under baseline conditions. In the lower fort area of Fort Monroe, average noise levels for the Lower Bracket scenario would be approximately 61.5 dB, which is 3.5 dB below baseline conditions (of 65 dB), as a result of lower traffic volumes. Just as in Phoebus, weekend traffic-related noise due to increased tourism during peak summer months may be greater than current weekend traffic noise, but the levels would still be below current weekday noise levels under baseline conditions. Therefore, overall minor beneficial effects would result from the Lower Bracket scenario.

Lower Bracket, Indirect. No indirect impacts would be expected.

Middle Bracket, Direct. In the long-term, minor to moderate adverse effects would be expected. Noise levels were modeled for the Middle Bracket scenario on Fort Monroe based on an analysis of increased residential intensity and tourism on Fort Monroe, changes in population density, building metrics from Table 3.3-3, and estimated changes in traffic volume from reuse (see Section 4.11 and Appendix H for details). In the long-term, minor to moderate adverse effects would be expected depending on the time of day and location of receptors after full build-out of Fort Monroe. These effects are due to increases in traffic volumes, particularly during the weekday evening commute period. Minor to moderate adverse effects may also occur during peak tourism periods (summer months) on the weekend, relative to current conditions.

In the lower fort area of Fort Monroe, average noise levels for the Middle Bracket scenario would be approximately 68.6 dB, which is approximately 4 dB above average baseline conditions (of 65 dB), as a result of higher traffic volumes. Average noise levels are expected to increase by less than 5 dB on Fort Monroe, which USEPA generally considers a minor change in noise (USEPA 1973, 1974). Furthermore, changes in peak noise levels (1 to 9 dB) will not exceed what VDOT considers to be a substantial change in noise (i.e., < 10 dB). Even with

increased traffic, noise levels estimated for the Middle Bracket scenario are fairly typical of urban residential areas. USEPA (1974) estimated that approximately a quarter of the entire urban population in the U.S. lives in areas with noise levels of 63 dB or above, and 7 percent experience noise levels of 68 dB or above.

Although noise increases would generally be considered minor, noise abatement measures designed through site-specific studies may be utilized by the FMA and other entities as potential mitigation for residential and sensitive receptors when exterior noise levels exceed 65 dB (see Section 4.15 for further discussion). In any event, as the U.S. transitions from gasoline- and diesel-powered vehicles to hybrid and electric-powered vehicles, long-term noise exposure may be reduced from the levels presented above.

In the community of Phoebus, evening weekday traffic and weekend summer traffic, particularly on major access roads to Fort Monroe (e.g., Mercury Boulevard and Mellen Street) will increase under the Middle Bracket scenario resulting in increased noise levels. As shown in Table 4.5-2, the traffic along specific modeled road segments is estimated to result in an increase in peak noise of 1 to 9 dB along these roads during weekday evening and weekend peak hours. In general, peak noise levels are expected to decline during the weekday morning hours relative to current baseline conditions. It is likely that certain residential areas in Phoebus located along major access roads to Fort Monroe (e.g., particularly Mercury Boulevard and Mellen Street) will have average noise levels commensurate with Fort Monroe (as previously discussed). In the long-term, full build-out at Fort Monroe under the Middle Bracket scenario would therefore result in minor to moderate adverse effects to noise levels in the community of Phoebus, depending on the receptor location and time of day.

Increased recreational motor boat usage will contribute to increased noise levels along the coastal area. Marina expansion may include the addition of up to 80 more boats. Furthermore, the no wake zone will also limit shoreline noise levels. In any event, vehicular traffic is by far the principal noise concern given the volume of vehicular traffic and proximity to the receptor (~24,000 vehicle trips per day, versus only 80 additional boats for the Middle Bracket scenario).

***Middle Bracket, Indirect*.** Long-term minor adverse effects would be expected. Regional economic and population growth generated from redevelopment, as well as increased commuter and tourism traffic to Fort Monroe, will increase traffic along existing regional roadways. This increase in regional traffic will slightly increase associated traffic noise on these roads.

Upper Bracket, Direct. In the long-term, minor to moderate adverse effects would be expected. Noise levels were modeled for the Upper Bracket scenario on Fort Monroe based on an analysis of increased residential intensity and tourism on Fort Monroe, changes in population density, building metrics from Table 3.3-3, and estimated changes in traffic volume from reuse (see Section 4.11 and Appendix H for details), as previously discussed. In the lower fort area of Fort Monroe, average noise levels for the Upper Bracket scenario would be approximately 69.5 dB, which is nearly 5 dB above average baseline conditions (of 65 dB), as a result of higher traffic volumes. As previously discussed, USEPA generally considers changes in noise of less than 5 dB to be a minor effect (USEPA 1973, 1974). Even with increased traffic, noise levels

estimated for the Upper Bracket scenario are fairly typical of urban residential areas. USEPA (1974) estimated that approximately a quarter of the entire urban population in the U.S. lives in areas with noise levels of 63 dB or above, and 7 percent experience noise levels of 68 dB or above. As previously discussed, noise abatement measures and supporting studies could mitigate noise levels above 65 dB. Although most areas are expected to be below 70 dB, it is possible for certain locations to exceed 70 dB under the Upper Bracket scenario (see Section 4.15 for further discussion of noise mitigation).

In the community of Phoebus, evening weekday traffic and weekend summer traffic, particularly on major access roads to Fort Monroe (e.g., Mercury Boulevard and Mellen Street) will increase under the Upper Bracket scenario resulting in increased noise levels. The increase in traffic noise along road segments will be less than 1 dB above the levels modeled for the Middle Bracket scenario, which are shown in Table 4.5-2. As with the Middle Bracket scenario, noise levels are expected to increase during the weekday evening peak commuter period and on the weekend, while noise levels will decline during the weekday morning peak hours as compared to baseline conditions. In any event, given current baseline noise levels in Phoebus estimated to be approximately 65 dB, it is likely that certain residential areas along major access roads to Fort Monroe (e.g., particularly Mercury Boulevard and Mellen Street) will be similar to noise levels modeled for Fort Monroe. In the long-term, full build-out at Fort Monroe under the Upper Bracket scenario would therefore result in minor to moderate adverse effects to noise levels in the community of Phoebus, depending on the receptor location and time of day.

Increased recreational motor boat usage will contribute to increased noise levels along the coastal area. Marina expansion may include the addition of up to 100 more boats. Furthermore, the no wake zone will also limit shoreline noise levels. In any event, vehicular traffic is by far the principal noise concern given the volume of vehicular traffic and proximity to the receptor (~29,000 vehicle trips per day, versus only 100 additional boats for the Upper Bracket scenario).

Upper Bracket, Indirect. Long-term minor adverse effects would be expected. Regional economic and population growth generated from redevelopment, as well as increased commuter and tourism traffic to Fort Monroe, will increase traffic along existing regional roadways. This increase in regional traffic will slightly increase associated traffic noise on these roads.

4.6 GEOLOGY AND SOILS

4.6.1 Affected Environment

4.6.1.1 Physiography and Topography

Fort Monroe lies on the mid-Atlantic coastal plain in a region where geology is influenced by the Eocene-epoch impact crater, which at over 50 miles in diameter is the largest known meteor-type crater in the U.S. The impact that caused this crater occurred near the town of Cape Charles, Virginia, over 35 million years ago and was central to the formation of the Chesapeake Bay (U.S; Geological Society [USGS] 2001, USGS 2005).

After the glaciers melted at the end of the last ice age, the river valleys of the James River and primarily the Susquehanna River were flooded by rising sea levels until about 3,000 years ago, when the Bay approximated its current configuration. The Bay continues to grow slowly as water levels rise roughly six inches per century. Fort Monroe is situated at the outer rim of the crater on approximately 568 acres of marine terrace located at the southern end of the bay. The surface topography is generally flat with an average elevation of 8 feet above mean sea level.

4.6.1.2 Structure and Subsurface Strata

Geological and archaeological testing has recorded late-nineteenth and twentieth century land-building fill depths of up to nine feet, depending on the location on post. Many areas within the installation contain dredge-fill material. At approximately 1,000 feet below the surface is the upper layer of the debris from the impact that fell back into the open crater. Above that lie the sedimentary layers that have been deposited over the ensuing millennia (USGS 2005).

4.6.1.3 Soils

The soils of Fort Monroe are typical for the mid-Atlantic coastline. These are combinations of sand, silt, and clay that are subject to considerable erosion. These soils are produced from water-transported parent material and are of two origins: alluvial material and marine sediments. Most high-maintenance landscaping is done on topsoil fill imported from off-base sources. The erosion potential for non-fill soil types found on post is generally slight to moderate, with the exception of sands, which have high erosion potential in barren areas lacking vegetation cover. Runoff ranges from very slow to medium in these soil types. Most of the upper one to one and one-half feet of the soils on Fort Monroe have been seriously disturbed. However, there are undisturbed soils beneath the disturbed soils.

Many areas of Fort Monroe contain dredge-fill material. The coastline soils at Fort Monroe are combinations of sand, silt, and clay of the Yorktown Formation that are subject to considerable erosion.

4.6.1.4 Seismic Activity

Southeastern Virginia has a low earthquake risk, similar to most coastal states along the mid-Atlantic. In Virginia's Coastal Plain earthquakes are particularly rare. Two zones in Virginia are more susceptible to earthquakes than others, and they can be identified by the rivers that follow those faults. The James River follows the Central Virginia Seismic Zone between Charlottesville and Richmond, while the New River follows the zone from Radford to the West Virginia border. Lifelong residents of the Fort Monroe area rarely, if ever, experience any indications of seismic activity. However, during the last 35 years a grid of highly sensitive sensors has been in operation to detect and record seismic activity down to the lowest levels. As a result, about 200 earthquakes have been recorded statewide in Virginia since 1977 (USGS 2000). All of these have been minor (2.9 or less on the Richter scale), meaning they are recordable but generally not felt. Within Virginia, Fort Monroe lies in the area of lowest effect and probability, and in this locality, none have been felt.

4.6.2 Consequences

4.6.2.1 Early Transfer Disposal Alternative

Direct. Minor short- and long-term adverse effects would be expected. Disposal of Fort Monroe will ultimately lead to limited demolition, site-clearing, and construction activities that could result in increases in erosion potential. In the near term, no effects are expected from the manner in which early transfer disposal occurs (i.e., as separate parcels or as one parcel; leasing strategies); however, such activities may affect the timing, duration, and short-term intensity of effects associated with non-federal ownership and redevelopment. In the long-term, redevelopment activities at Fort Monroe will principally focus on renovation of existing structures located within developed areas, as well as limited expansion of development and impervious surface (e.g., in North Gate and the Wherry Housing Quarter). Based on an analysis of conceptual development plans from the Reuse Plan, aerial photography analysis, and building metrics from Table 3.3-3; up to 100 acres may ultimately be disturbed from redevelopment, spread over the course of 20 years (up to 10 acres in any given year, up to 5 acres per year on average) (see Section 4.8.2.5 for further discussion). Disturbance of soil during construction may result in increased soil erosion potential. Furthermore, impervious surface will increase from 24 percent (baseline conditions) to up to 28 percent at full build-out. This minor increase in impervious surface can slightly increase stormwater flows which can cause increases in erosion along drainage areas. As erosion and sediment control (ESC) practices are required during redevelopment activities, adverse effects will be minimized, if not eliminated. The *Virginia Erosion and Sediment Control Handbook* (published by the Virginia Department of Conservation and Recreation [VDCR]) provides guidance for all state ESC programs. It covers basic concepts, design, installation, maintenance, plan review procedures, and administrative guidelines to support compliance with the Virginia ESC Law and Regulations.

Indirect. No effects are expected.

4.6.2.2 Traditional Disposal Alternative

Direct. Minor short- and long-term adverse effects would be expected, similar to the effects outlined for early transfer.

Indirect. No effects are expected.

4.6.2.3 Caretaker Status Alternative

Direct. Minor adverse effects would be expected. Under the caretaker status, natural resource management programs and objectives may not be pursued to the same degree as under current conditions. This could result in low levels of erosion controls and vegetative controls that benefit geologic and soil resources.

Indirect. Long-term minor beneficial effects would be expected. Military missions would cease, and new construction and ground-disturbing activities would be reduced. Thus, land use intensity would be below levels assumed under current conditions, resulting in long-term minor benefits to geologic resources.

4.6.2.4 No Action Alternative

No direct or indirect effects would be expected. Under the no action alternative, the Army would continue operations at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure and realignment, including implementation of INRMP measures and remedial programs required under CERCLA and RCRA. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.6.2.5 Intensity-Based Probable Use Scenario

Lower Bracket, Direct. Short- and long-term minor adverse effects would be expected. Although there would be no net increase in impervious surfaces, limited demolition and clearing associated with creating more open space for recreation areas, as well as the potential removal of the airfield pavement, has the potential to adversely affect soils and increase erosion potential locally. Once soil disturbance activities are completed, vegetation would easily stabilize the soil because of the relatively flat topography.

Lower Bracket, Indirect. No effects would be expected.

Middle Bracket, Direct. Short- and long-term adverse minor effects would be expected. Based on an analysis of conceptual development plans from the Reuse Plan, aerial photography analysis, and building metrics from Table 3.3-3; up to 85 acres may ultimately be disturbed from redevelopment, spread over the course of 20 years. Disturbance of soil during construction may result in increased soil erosion potential. The disturbed areas mainly consists of existing developed areas which include existing building structures, parking lots, and lawn areas adjacent to or between developed areas. The disturbed areas will include isolated project footprints that may range from a quarter acre to up to 10 acres in size (e.g., removal of the airstrip). On average the area of disturbance is estimated to be less than 5 acres per year over the total build-out period. As ESC practices are required during redevelopment activities (as outlined in the *Virginia Erosion and Sediment Control*

Handbook published by the VDCR) adverse effects will be minimized, if not eliminated. Furthermore, these areas are also relatively flat; therefore, erosion potential is minimized. The *Virginia Erosion and Sediment Control Handbook* provides guidance for all state ESC programs. It covers basic concepts, design, installation, maintenance, plan review procedures, and administrative guidelines to support compliance with the Virginia ESC Law and Regulations. In addition to ground disturbance activities, impervious surface will increase from 24 percent (baseline conditions) to up to 27 percent at full build-out. This minor increase in impervious surface can slightly increase stormwater flows which can cause increases in erosion along drainage areas. Implementing required sediment control practices during redevelopment activities will minimize potential adverse effects.

***Middle Bracket, Indirect*.** No effects would be anticipated.

Upper Bracket, Direct. Short- and long-term adverse minor effects would be expected as described for the Middle Bracket scenario, but to a slightly greater degree. Building construction involving soil excavation, grading, soil removal, asphalt removal, and vegetation clearing would increase soil disturbance. Overall, construction activities are estimated to disturb up to 100 acres of land over the 20 year build-out period. In addition, impervious surface is estimated to increase to 28 percent of the buildable area surface (4 percent increase above baseline). As a result, short- and long-term minor adverse effects to soils, similar to those described for the Middle Bracket scenario, will occur. Likewise, implementing required erosion and stormwater control practices during redevelopment activities would minimize potential adverse effects.

Upper Bracket, Indirect. No effects would be anticipated.

4.7 WATER RESOURCES

4.7.1 Affected Environment

Water resources include surface and groundwater resources. Surface water includes lakes, rivers, canals, and streams and is important for economics, ecology, recreation, and human health considerations. In southeastern Virginia, these resources are fed, in part, by an average annual rainfall of 47 inches and an average annual snowfall of 6 inches, which are a reflection of a temperate four-season climate.

Surface water at Fort Monroe includes the moat, tidal basins (Mill Creek) and shorelines of the Chesapeake Bay. The post has about 16,000 feet that faces Hampton Roads Harbor (south) and the Chesapeake Bay (east). Mill Creek (west) accounts for approximately 13,000 feet of shoreline, and there is another 4,000 feet of shoreline on which the marina is situated, that faces southwest toward the James River. In total, Fort Monroe is almost completely surrounded by about 33,000 feet, or 6.25 miles, of tidal waters associated with the lower Chesapeake Bay. The salinity of the Chesapeake Bay and Hampton Roads Harbor ranges from 14 to 18 parts per thousand. Other tributaries flowing into the bay are predominately brackish, and the primary mixing action in the Fort Monroe area is from tidal forces.

Fort Monroe has a small tidal marsh area located at the northern end of the installation. The tidal marsh area of Mill Creek covers approximately 85 acres, of which 53 acres are within Fort Monroe's boundaries. It has been classified as Group One salt marsh, the highest quality and most ecologically productive wetland, and is dominated by salt-marsh cord grass (*Spartina alterniflora*). Near-surface groundwater underlying Fort Monroe experiences significant tidal influence, generally of the same magnitude as the Chesapeake Bay.

4.7.1.1 Surface Water Quality

Surface water discharges at Fort Monroe, including from the marina, are subject to, and compliant with, the Virginia Pollutant Discharge Elimination System (VPDES). Potential sources of surface water degradation may include stormwater point discharges and non-point source run off.

Water quality of the lower James River, which abuts the western shoreline of Fort Monroe, is listed as impaired under the CWA, Section 303(d) program and does not meet designated uses as reported by USEPA (2009) for the protection of aquatic life and fish consumption. The eastern shoreline of Fort Monroe is on the Chesapeake Bay, which is not rated under the 303(d) program. The cause of the impairment in the lower James River relative to Chlorophyll-A standard exceedances is similar to other common problems experienced in the Chesapeake Bay system and is considered a regional problem with many potential sources. Specifically, waters at the mouth of the James River are exceeding Chlorophyll-A standards which is an indicator of excess nutrient loadings. Nutrient loadings in the James River watershed are principally associated with agricultural loadings, with some contribution from industrial and municipal point source discharges (USEPA 2009, Chesapeake Bay Program 2009). For reporting year 2008, USEPA issued

an advisory on fish consumption from the James River specifically associated with excess Polychlorinated Biphenyls (PCB) concentrations in fish tissue. This advisory terminates at the HRBT. Similar fish advisories have been instituted in many locations throughout the James River watershed. The source is listed as unknown (USEPA 2009). No other chemical contaminant water quality issues were identified as a concern in the 303(d) list.

A detailed water quality analysis of the James River watershed and lower Chesapeake Bay conducted by the Chesapeake Bay Program (2009) indicated the following regarding the water quality and sources surrounding Fort Monroe:

- Like most of the Chesapeake Bay, the mouth of the James River and the lower portion of the Chesapeake Bay did not meet Chlorophyll A goals at most of the stations and sampling periods, indicating excess nutrient loadings.

- Within the James River watershed, most of the nitrogen loadings are associated with agricultural based sources in the upper reaches of the watershed, while both urban and agricultural sources are major sources of phosphorus.

- Water clarity goals were not being met for the James River and the Chesapeake Bay (which can adversely affect submerged vegetation growth).

- No priority point sources and no agricultural watersheds of concern were identified within the City of Hampton, only in other portions of the James River watershed.

- Shellfish harvesting is condemned on the Mill Creek side of Fort Monroe and shorelines of the Hampton Roads area due to exceedance of the fecal coliform water quality standard for consumption of shellfish. Harvesting is still permitted on the Chesapeake Bay side of Fort Monroe.

- Phytoplankton biological indices were rated “poor to fair” at a sampling station to the south of Fort Monroe (near the tunnel), as were most sampling stations throughout the Chesapeake Bay.

- Benthic biological indices measured at several sampling stations near Fort Monroe were rated as “meeting goals”, unlike many stations throughout the Chesapeake Bay.

Although dissolved oxygen is of concern in many parts of the bay, sampling stations at the mouth of the James River and in the lower part of the Chesapeake Bay met 100 percent of goals established for dissolved oxygen.

With respect to drinking water resources, surface waters in the vicinity of Fort Monroe are not used as a source of potable water. There are no surface water intakes within 5 miles of the installation.

The Chesapeake Bay Preservation Act (CBPA) was passed to protect environmentally sensitive areas such of the Chesapeake Bay system, which includes Mill Creek and the Hampton Roads Harbor. An excerpt from the ecological trends report on the condition of the Chesapeake Bay is provided below:

> *The Chesapeake Bay, the nation's largest estuary, has experienced serious environmental degradation during the past century. Symptoms of degradation are large declines in submerged aquatic vegetation acreage and in finfish and shellfish (oysters and crab) populations, seasonal depletions in dissolved oxygen, and increases in sedimentation. These environmental changes have raised serious concern because they threaten major commercial and recreational activities by damaging key habitats and reducing water quality necessary for Bay species to survive and reproduce. Most scientists attribute these changes, at least indirectly, to ecological stress from human activities, especially land use changes in the Bay watershed related to deforestation, agriculture, use of fertilizers, and more recently, urbanization, pollution, and sewage. Future stress on Bay ecosystems will potentially worsen, as the Chesapeake Bay Commission predicts that the population in the Bay watershed will swell to 17.4 million by the year 2020* (USGS 2006).

On 12 May 2009, E.O. 13508 (Chesapeake Bay Protection and Restoration) was issued recognizing that "restoration of the health of the Chesapeake Bay will require a renewed commitment to controlling pollution from all sources as well as protecting and restoring habitat and living resources, conserving lands, and improving management of natural resources, all of which contribute to improved water quality and ecosystem health." This E.O. provides a path forward to reach this goal.

4.7.1.2 Hydrogeology/Groundwater

Groundwater comprises the subsurface hydrogeologic resources of the physical environment and is an essential resource in many areas. Near-surface groundwater at Fort Monroe experiences significant tidal influence, generally of the same magnitude as the bay. This is because of the high hydraulic conductivity of the porous soils and sand deposits at Fort Monroe.

Groundwater Uses

Because of its high iron content and salinity, groundwater is not used at Fort Monroe. Water is supplied for residential and commercial uses by the Newport News Waterworks (NNWW). There are no groundwater potable wells within 1 mile of Fort Monroe.

4.7.1.3 Floodplains

Floodplains are defined in federal regulations (10 CFR Section 1022.4) as lowland areas adjoining inland and coastal waters, and relatively flat areas and flood-prone areas of offshore islands. The term "floodplain" generally refers to the 100-year floodplain, which

designates the area that would be subjected to inundation from a flood that has a 1 percent chance of occurring in any given year based on historical records and calculated statistical probabilities. This flood event is referred to as the “100-year flood” or “base flood” and may occur more or less often than once every 100 years.

According to the Federal Emergency Management Agency, Fort Monroe is located entirely within a 100-year floodplain, with the majority of Fort Monroe classified as having flood levels ranging from 9 to 10 feet. To partially mitigate this risk, the Army conducted floodproofing and shoreline stabilization projects to reduce flooding risks at Fort Monroe in 2005 and 2007. The northeastern edge of Fort Monroe is designated as an area of 100-year coastal flooding with velocity (wave action). The area adjacent to Fenwick Road on the northeastern end of Fort Monroe is designated as an area of minimal flooding.

4.7.1.4 Coastal Zone

The Commonwealth of Virginia has developed and implemented a federally approved Coastal Resources Management Program describing current coastal legislation and enforceable policies. The actions subject to federal policy include: commercial fishing, recreational fishing in freshwater tidal rivers, encroachments on subaqueous lands, encroachments on wetlands, encroachments on primary sand dunes, land-disturbing activities needing ESC, actual or potential wastewater discharges, control of septic and other on-site domestic waste systems, coastal land management, and air pollution control.

The U.S. Code [16 USC 1456(c)(2)] requires that "any federal agency which shall undertake any development project in the coastal zone of a state shall ensure that the project is, to the maximum extent practicable, consistent with the enforceable policies of approved state management programs." The requirement is reinforced by the 15 CFR 930.33(b), which states that "federal agencies shall consider all development projects within the coastal zone to be activities affecting any coastal use or resource."

A network of core agencies and coastal localities in the Commonwealth administers the enforceable policies of the Virginia Coastal Resources Management Program (Virginia Coastal Program [VCP]). The VDEQ serves as the lead agency for the program.

Fort Monroe manages and preserves coastal resources as part of its natural resources stewardship role and with the guidance of its INRMP, and has complied with the CZMA on all applicable projects including the new seawall and breakwater project. For the Army activities associated with closure of Fort Monroe, the Army sought a CZMA consistency determination from the Commonwealth. The response from VDEQ regarding this request is provided in Appendix A (letter from Ms. Ellie Irons, VDEQ dated 6 November 2009, Appendix A). The Commonwealth of Virginia concurred that the proposal was consistent with the VCP (also known as the Virginia Coastal Zone Management Program), which involves a network of agencies responsible for administering VCP. A public notice regarding the request and public input was published on VDEQ’s website from 9 October 2009 through 30 October 2009. No public comments were received from this notice. Development projects that could affect coastal use or coastal resources, such as expansion of the marina, that are proposed by the new owners of the Fort Monroe

property after conveyance would require CZMA compliance and a consistency determination with coordination with VDEQ and the appropriate local government entity in accordance with the CBPA. Proposals at this stage of planning are not sufficiently formulated to request project-specific determinations.

4.7.2 Consequences

4.7.2.1 Early Transfer Disposal Alternative

Direct. Minor short- and long-term adverse effects may result from early transfer of Fort Monroe. Based on an analysis of conceptual development plans from the Reuse Plan, aerial photography analysis, and building metrics from Table 3.3-3; changes in soil disturbance, stormwater controls, and impervious surface were estimated for the range of redevelopment scenarios that would occur following transfer (see Section 4.7.2.5 for further discussion). Overall, increases in impervious surface (from 24 percent to 28 percent), marina expansion (up to a 30 percent increase for the construction of up to 5 docks for up to 100 additional boats), traffic, and soil disturbing activities on-site will increase stormwater runoff and degrade to some degree water quality in the immediate vicinity of outfalls and areas adjacent to the shoreline (particularly above the existing marina area where a marina expansion is planned). Adherence to Best Management Practices (BMP) for erosion and stormwater control (discussed in Sections 4.4 and 4.15), regulatory controls (e.g., for marinas and outfalls), required stormwater and point source permitting, marina encroachment permitting as required by the Virginia Marine Resources Commission (VMRC) in accordance with Virginia Code §28.2-1204, and planned stormwater expansions, will ensure that impacts to water quality are not significant. Furthermore, these actions will have a negligible effect on nutrient loading which is the principal source of surface water impairment in the waters surrounding Fort Monroe.

As previously noted, shellfish harvesting is condemned on the Mill Creek side of Fort Monroe and shorelines of the Hampton Roads area due to exceedance of the fecal colliform water quality standard for consumption of shellfish. Harvesting is still permitted on the Chesapeake Bay side of Fort Monroe. Early transfer of Fort Monroe to other entities would have a negligible effect on the current and future status of this condemnation, as the problem pertains to regional point and nonpoint sources of excess fecal coliform and nutrient loadings. The Virginia Department of Health (VDH) concurred that disposal and reuse would have “minimal, if any, effect” on the status of shellfish harvesting (see VDEQ letter dated 6 November 2009 in Appendix A).

Indirect. No indirect effects are expected at Fort Monroe.

4.7.2.2 Traditional Disposal Alternative

Direct. Minor short- and long-term adverse effects, similar to those described under the early transfer disposal alternative, are expected. These effects would occur further in the future.

Indirect. No indirect effects are expected at Fort Monroe.

4.7.2.3 Caretaker Status Alternative

Direct. Short- and long-term beneficial effects would be expected at Fort Monroe. Reduction in facility operations could have a beneficial effect. Caretaker status would involve reduced water use and wastewater treatment requirements, as well as fewer vehicles, which are potential sources of contaminants such as lubricants, coolants, and fuels that could be transported by storm water runoff. Likewise, caretaker status would involve less use of fertilizers, fuels, pesticides and herbicides, and reduced warehouse and shop activities, which would also contribute to a reduction in storm water contaminant loads.

Indirect. No indirect effects are expected at Fort Monroe.

4.7.2.4 No Action Alternative

No direct or indirect effects are expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for realignment and closure, including implementation of INRMP measures and remedial programs required under CERCLA and RCRA. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.7.2.5 Intensity-Based Probable Use Scenario

***Lower Bracket, Direct*.** Long-term minor beneficial impacts would be expected. Based on an analysis of changes in on-site population and associated traffic between baseline conditions and the Lower Bracket scenario (using metrics from Table 3.3-3 and tourism and traffic estimates discussed in Section 4.11), minor beneficial effects to water resources will occur. The Lower Bracket scenario would result in reduced traffic (half the traffic relative to baseline conditions), reduced human presence (one-third of the on-site population, when considering changes in employment, residential population, and tourism), and slight decreases in impervious surfaces (removal of a small number of isolated structures, unused parking areas, and airstrip). As a result, stormwater runoff and non-point source pollutant loadings from human activities will be reduced, resulting in minor beneficial effects.

Lower Bracket, Indirect. No indirect effects are expected at Fort Monroe.

Middle Bracket, Direct*.* There would be minor short- and long-term adverse effects. Based on an analysis of conceptual development plans from the Reuse Plan, aerial photography analysis, and building metrics from Table 3.3-3; changes in soil disturbance, stormwater controls, and impervious surface were estimated for the range of redevelopment scenarios that would occur following transfer. Overall, increases in impervious surface (from 24 percent to 27 percent), marina expansion (up to 4 docks for up to 80 additional boats), and soil disturbing activities on-site (up to 85 acres disturbed over the next 20 years) will increase erosion potential that could have an adverse effect on water quality in the immediate vicinity of outfalls and areas adjacent to the shoreline (particularly above the existing marina area where a marina expansion is planned). The disturbed areas will include isolated project footprints that may range from a quarter acre

to up to 10 acres in size (e.g., removal of the airstrip). On average the area of disturbance is estimated to be less than 5 acres per year over the total build-out period. Project footprints of 5 acres or more will require a VPDES stormwater permit for the protection of water quality (U.S. Army 2000). Furthermore, project footprints greater than 2,500 feet would require preparation of an ESC plan to the City of Hampton and compliance with the Virginia ESC Law §4 VAC 50 et al., as well as other regulations (see letter from VDEQ, dated 6 November 2009 in Appendix A for further references to regulatory requirements). Furthermore, increased traffic (more than doubling of road traffic) and impervious surface may slightly degrade water quality of stormwater runoff in the portion of waterbodies immediately adjacent to Fort Monroe (i.e., Mill Creek to the west, Chesapeake Bay to the east, and Hampton Roads Harbor to the south). Roadways will be expanded in some cases and additional parking will be provided to accommodate expected increases in traffic. Any fuel, oil, and coolant dripped or spilled onto paved surfaces due to increased traffic could be discharged into the storm water system (as a non-point source), which could have a minor adverse effect on nearby water quality from run-off. Adherence to BMPs for erosion and stormwater control (discussed in Section 4.4 and 4.15) (Virginia ESC Law and Regulations, preparation of an ESC plan and Stormwater Management [SWM] plan), regulatory controls (e.g., for marinas and outfalls, as well as CBPA compliance), marina encroachment permitting as required by the VMRC in accordance with Virginia Code §28.2-1204, required stormwater and point source permitting (e.g., VPDES permits, Virginia Water Protection Permit [VWPP], Virginia SWM Law and Regulations § 10.1-603.1, VSMP Permit Regulations § 4 VAC 50 et seq., Section 313 of the CWA), and planned wastewater and stormwater upgrades will ensure that impacts to water quality are not significant. Furthermore, these actions will have a negligible effect on nutrient loading which is the principal source of surface water impairment in the waters surrounding Fort Monroe.

As previously noted, shellfish harvesting is condemned on the Mill Creek side of Fort Monroe and shorelines of the Hampton Roads area due to exceedance of the fecal coliform water quality standard for consumption of shellfish. Harvesting is still permitted on the Chesapeake Bay side of Fort Monroe. Early transfer of Fort Monroe to other entities would have a negligible effect on the current and future status of this condemnation, as the problem pertains to regional point and nonpoint sources of excess fecal colliform and nutrient loadings. VDH concurred that disposal and reuse would have “minimal, if any, effect” on the status of shellfish harvesting (see VDEQ letter dated 6 November 2009 in Appendix A).

The marina presently has 314 permanent boat slips with one temporary slip at the end of each of ten 19-50 slip docks. It is not the slips that are temporary, but their usage. Dubbed “T-slips,” these are intended for short term stays only, making them ideal for boaters using the Atlantic Intercoastal Waterway. There have been extremely few known releases of pollutants from the marina into the James River. Marina expansion is also subject to encroachment permitting and review as required by VMRC in accordance with Virginia Code §28.2-1204. Therefore, even with the largest reasonably conceivable marina expansion, and in light of the current history and regulatory controls, the potential for future additional release is considered minor.

There would be minor adverse impacts on the installation's surface waters and wetlands as a result of increased runoff, impervious surfaces, and disturbance caused by construction. Roadways will be expanded in some cases and additional parking will be provided to accommodate expected increases in traffic. Any fuel,oil, and coolant dripped or spilled onto paved surfaces would be discharged into the storm water system and, in some locations, there could be direct run-off into Mill Creek and the Chesapeake Bay from this traffic would be a direct adverse effects.

Although the INRMP would no longer apply, water resources would remain protected by federal and state laws and regulations with this and all reasonable levels of reuse.

***Middle Bracket, Indirect*.** No indirect effects are expected at Fort Monroe.

Upper Bracket, Direct. Minor short- and long-term adverse effects could be expected. Effects would be similar to the Middle Bracket scenario, but with slightly higher intensity due to an increased residential population. (75 percent increase in population relative to baseline), building intensity (10 percent increase in building structures relative to the Middle Bracket scenario), and traffic (nearly three times baseline traffic levels). Overall, increases in impervious surface (from 24 percent to 28 percent), marina expansion (up to 5 docks for up to 100 additional boats), and soil disturbing activities on-site (up to 100 acres disturbed over the next 20 years) will increase erosion potential that could have an adverse effect on water quality in the immediate vicinity of outfalls and areas adjacent to the shoreline (particularly above the existing marina area where a marina expansion is planned). Furthermore, increased traffic (nearly three times baseline traffic) and impervious surface may slightly degrade water quality of stormwater runoff in the portion of waterbodies immediately adjacent to Fort Monroe. As discussed above under the Middle Bracket scenario, adherence to BMPs for erosion and stormwater control, regulatory controls (e.g., for marinas and outfalls), required stormwater and point source permitting, and planned wastewater and stormwater upgrades will ensure that impacts to water quality are not significant (see discussion of proposed mitigation in Section 4.15). Furthermore, these actions will have a negligible effect on nutrient loadings which is the principal source of surface water impairment in the waters surrounding Fort Monroe.

Upper Bracket, Indirect. No indirect effects are expected at Fort Monroe.

4.8 BIOLOGICAL RESOURCES

4.8.1 Affected Environment

An INRMP and supporting field studies for Fort Monroe were developed to ensure that natural resource conservation measures and Army activities on mission land are integrated and are consistent with federal stewardship requirements. The INRMP and these supporting studies provide the principal basis for describing the biological resources of Fort Monroe and surrounding area (U.S. Army 2000).

Biological Setting

Mill Creek is a tidal estuary that lies between the north, northwest shoreline of Fort Monroe and the south, southeast shoreline of the mainland. Mill Creek has a surface area of approximately 1.25 square miles, which includes approximately 85 acres of highly valuable wetlands. Estuarine emergent wetland can be found in areas exposed to Mill Creek located immediately northwest of the fort's land mass. Shoreline engineering has altered much of the original natural habitat in the southern portions of Fort Monroe, resulting in a poor representation of linear wetlands. Historically, Mill Creek has been a breeding ground for oysters and anadromous fish species (U.S. Army 2000).

Fort Monroe is a barrier island that has become connected to the mainland by a narrow sand spit at the north end and at the southwest end via a causeway. As such, Fort Monroe is essentially a "biological island" with isolated valuable habitats surrounded by barriers to movement such as salt water or highways (U.S. Fish and Wildlife Service [USFWS] 1998). The array of species at Fort Monroe is limited by human occupation occurring at nearly the same time that the island became joined to the mainland. Other qualitative and quantitative constraints to flora and fauna are the limited types and areas of vegetation available to provide cover and food resources, exposure to salty winds and water, and a shortage of fresh water (U.S. Army 2000).

The Fort Monroe area has been used intermittently as a fortification since 1610 and has been used continuously since about 1819, when construction of the present-day fortifications began. Existing natural areas are irregularly shaped and highly fragmented into areas of only a few hundred yards square. The northern area has a natural shoreline and is surrounded by salt marsh on the Mill Creek side. Several emergent *Spartina* marsh islands occur in Mill Creek. Generally, these islands serve as suitable breeding areas for a number of water birds (U.S. Army 2000).

Land use at Fort Monroe consists of 12 principal land management units, as identified in Table 4.8-1.

Table 4.8-1 Land Management Units at Fort Monroe

Land Use	Acreage	Percent of Total	Land Use	Acreage	Percent of Total
Moat	20	4	Parade Ground	10	2
Dog Beach	33	4	Administrative	25	4
Outdoor Recreation	160	21	Industrial/Services	57	10
Community Support	21	4	Ammunition Storage	9	2
Family Housing (Army and Contract)	72	12	Troop Housing/Support	4	1
Airfield	100	18	Other Areas	103	18
Source: R&K Engineering 2002 (*revised*)					

4.8.1.1 Flora

Historical records indicate that Fort Monroe consisted of a narrow sand-spit with associated salt marshes and ponds. Predominant native species included live oaks (*Quercus virginiana*), scrub pines, and salt-tolerant grasses and shrubs. Currently, much of this native habitat has been disturbed. Several floral inventories and vegetation community surveys have been conducted at Fort Monroe to document the remaining vegetation (U.S. Army 2000), including surveys in 1998, and more recently in 2003 and 2005.

In 2003, Fort Monroe "natural areas" were resurveyed to update/confirm the findings of the 1998 USFWS Biological Diversity Survey, including the area along Dog Beach; several managed areas, with infrequent or no maintenance (i.e., shoreline areas, batteries, jetties) where vegetation is allowed to grow; marsh islands located within Mill Creek; and plants in developed areas of the installation. The study documented 80 plant species occurring at Fort Monroe, including 22 species considered invasive and undesirable, such as the common reed (*Phragmites australis)* and red lovegrass *(Eragrostis secundiflora* var. *oxylepis)*. Red lovegrass and phragmites are introduced flora and are characterized as aggressive and habitat threatening plants. Fort Monroe has close to 650 oak trees, 500 of them being "live oaks". The Fort Monroe area is the northern-most habitat of live oak and several specimens on the installation are believed to be over 400 years old. Common flora identified on Fort Monroe are presented in Table 4.8-2 (U.S. Army 2000).

Table 4.8-2 Common Coastal Plain Plant Species Occurring at Fort Monroe

Common Name	Scientific Name	Common Name	Scientific Name
American beachgrass	*Ammophila breviligulata*	Red bay	*Persea borbonia*
Annual saltmarsh aster	*Aster subulatus*	Retrorse flat sedge	*Cyperus grayi*
Annual woolly bean	*Strophostyles helvula*	Russian thistle	*Salsola kali*
Bear grass	*Yucca filamentosa*	Salt grass	*Distichlis spicata*
Big marsh cord grass	*Spartina alterniflora*	Salt meadow cord grass	*Spartina patens*
Bitter panic grass	*Panicum amarum*	Sea oats	*Uniola paniculata*
Bull bay	*Magnolia grandiflora*	Sea lavender	*Limonium carolinianum*
Buttonweed	*Diodia teres*	Sea oxeye	*Borrichia frutescens*
Carolina pony-foot	*Dichondra carolinensis*	Seedbox	*Ludwigia sp.*
Dune sandbur	*Cenchrus tribuloides*	Slender glasswort	*Salicornia europaea*
Goldenrod	*Euthamia graminifolia*	Spearscale	*Atriplex patula*
Groundsel tree	*Baccharis halimifolia*	Spreading evening primrose	*Oenothera humifusa*
Hooker sea rocket	*Cakile edentula*	Stoneseed	*Lithospermum arvense*
Horsemint	*Monarda punctata*	Upland cord grass	*Spartina cynosuroides*
Manyspike flat sedge	*Cyperus filicinus*	Virginia live oak	*Quercus virginiana*
Maritime marsh elder	*Iva frutescens*	Virginia seashore mallow	*Kosteletsyka virginica*
Needlerush	*Juncus roemerianus*	Wax myrtle	*Myrica cerifera*
Oakes ebony spleenwort	*Asplenium platyneuron*	Water loosestrife	*Decodon verticillatus*
Perennial saltmarsh aster	*Aster tenuifolius*	White vervain	*Verbena urticifolia*
Source: U.S. Army 2000			

4.8.1.2 Fauna

The absence of available habitat and lack of habitat diversity on post limit the variety of birds, mammals, and reptiles and amphibians at Fort Monroe. The most common species are those typically associated with populated urban areas and the total number of species observed on Fort Monroe has reached 217, of which 68 species use the installation for breeding (U.S. Army 2000).

4.8.1.2.1 Mammals

The USFWS Biological Diversity Survey reported 24 mammal species inhabiting or suspected to occur on Fort Monroe, including the muskrat (*Ondata zibeticus*), river otter (*Lutra canadensis*), and cottontail rabbit (*Sylvilagus floridanus*). Table 4.8-3 provides a

detailed list of fauna species that were confirmed or suspected to occur at Fort Monroe based on survey and literature data.

Table 4.8-3 Mammals Found at Fort Monroe, Virginia

Common Name	Scientific Name	Status[1]
Shorttail Shrew	*Blarina brevicauda*	s
Starnose Mole	*Condylura cristata*	s
Least Shrew	*Cryptotis parva*	s
Opossum	*Didelphis virginiana*	c
River Otter	*Lutra canadensis*	c
Striped Skunk	*Mephitis mephitis*	s
Meadow Vole	*Microtus pennsylvanicus*	s
Evening Bat	*Nycticeius humeralis*	s
Muskrat	*Ondata zibeticus*	c
Marsh Rice Rat	*Oryzomys palustris*	s
White-Footed Mouse	*Peromyscus leucopus*	s
Eastern Pipstrel	*Pipistrellus subflavus*	s
Raccoon	*Procyon lotor*	c
Eastern Harvest Mouse	*Reithrodonotomys humulis*	c
Eastern Mole	*Scalopus aquaticus*	s
Gray Squirrel	*Sciurus carolinensis*	c
Hispid Cotton Rat	*Sigmodon hispidus*	s
Southeastern Shrew	*Sorex longirostris*	s
Marsh Rabbit	*Sylvilagus palustris*	s
Cottontail Rabbit	*Sylvilagus floridanus*	c
Southern Bog Lemming	*Synaptomys cooperi*	s
Eastern Chipmunk	*Tamis striatus*	c
Red Fox	*Vulpes fulva*	s
Meadow Jumping Mouse	*Zapus hudsonius*	s

Source: U.S. Army 2000
[1] c = Confirmed, s = Suspected

4.8.1.2.2 Birds

Numerous bird species are known or suspected to occur at Fort Monroe (see Table 4.8-4), particularly in the estuarial wetland areas in the northern area of the fort, adjacent to Mill Creek (U.S. Army 2000). A colonial waterbird colony is documented at the southern tip of Fort Monroe, as well as at the HRBT. Additional information on bird species is located in the discussion regarding the MBTA (see Section 4.8.1.4).

Table 4.8-4 Bird Species Found at Fort Monroe

Common Name	Scientific Name	Common Name	Scientific Name
Red-throated Loon	*Gavia stellata*	Herring Gull	*Larus argentatus*
Common Loon	*Gavia immer*	Iceland Gull	*Larus glaucoides*
Pied-billed Grebe	*Podilymbus podiceps*	Great Black-backed Gull	*Larus marinus*
Horned Grebe	*Podiceps auritus*	Gull-billed Tern	*Sterna nilotica*
Red-necked Grebe	*Podiceps grisegena*	Caspian Tern	*Sterna caspia*
Eared Grebe	*Podiceps nigricollis*	Royal Tern	*Sterna maxima*
Wilson's Storm-Petrel	*Oceanites oceanicus*	Sandwich Tern	*Sterna sandvicensis*
Northern Gannet	*Morus bassanus*	Common Tern *	*Sterna hirundo*
Brown Pelican	*Pelecanus occidentalis*	Forster's Tern	*Sterna forsteri*
Great Cormorant	*Phalacrocorax carbo*	Least Tern	*Sterna antillarum*
Double-crested Cormorant	*Phalacrocorax auritus*	Black Tern	*Chlidonias niger*
American Bittern	*Botaurus lentiginosus*	Black Skimmer *	*Rynchops niger*
Least Bittern	*Ixobrychus exilis*	Rock Dove *	*Columba livia*
Great Blue Heron *	*Ardea herodias*	Mourning Dove *	*Zenaida macroura*
Snowy Egret	*Egretta thula*	Black-billed Cuckoo	*Coccyzus erythropthalmus*
Little Blue Heron	*Egretta caerulea*	Yellow-billed Cuckoo *	*Coccyzus americanus*
Tricolored Heron	*Egretta tricolor*	Barn Owl	*Tyto alba*
Cattle Egret	*Bubulcus ibis*	Eastern Screech-Owl *	*Otus asio*
Green Heron *	*Butorides virescens*	Barred Owl	*Strix varia*
Black-crowned Night-Heron	*Nycticorax nycticorax*	Short-eared Owl	*Asio flammeus*
Yellow-crowned Night-Heron *	*Nyctanassa violacea*	Common Nighthawk	*Chordeiles minor*
Glossy Ibis	*Plegadis falcinellus*	Chuck-will's-widow	*Caprimulgus carolinensis*
Tundra Swan	*Cygnus columbianus*	Chimney Swift *	*Chaetura pelagica*
Snow Goose	*Chen caerulescens*	Ruby-throated Hummingbird*	*Archilochus colubris*
Brant	*Branta bernicla*	Belted Kingfisher*	*Ceryle alcyon*
Canada Goose *	*Branta canadensis*	Red-headed Woodpecker	*Melanerpes erythrocephalus*
Wood Duck *	*Aix sponsa*	Red-bellied Woodpecker*	*Melanerpes carolinus*
Green-winged Teal	*Anas crecca*	Yellow-bellied Sapsucker	*Sphyrapicus varius*
American Black Duck *	*Anas rubripes*	Downy Woodpecker*	*Picoides pubescens*
Mallard *	*Anas platyrhynchos*	Hairy Woodpecker *	*Picoides villosus*

Common Name	Scientific Name	Common Name	Scientific Name
Northern Pintail	*Anas acuta*	Northern Flicker *	*Colaptes auratus*
Blue-winged Teal	*Anas discors*	Pileated Woodpecker *	*Dryocopus pileatus*
Northern Shoveler	*Anas clypeata*	Blue Jay *	*Cyanocitta cristata*
Gadwall	*Anas strepera*	American Crow *	*Corvus brachyrhynchos*
Eurasian Wigeon	*Anas penelope*	Tufted Titmouse *	*Baeolophus bicolor*
American Wigeon	*Anas americana*	Red-breasted Nuthatch	*Sitta canadensis*
Canvasback	*Aythya valisineria*	White-breasted Nuthatch *	*Sitta carolinensis*
Redhead	*ythya americana*	Brown-headed Nuthatch	*Sitta pusilla*
Greater Scaup	*Aythya marila*	Brown Creeper	*Certhia americana*
Lesser Scaup	*Aythya affinis*	Carolina Wren *	*Thryothorus ludovicianus*
Common Eider	*Somateria mollissima*	House Wren *	*Troglodytes aedon*
King Eider	*Somateria spectabilis*	Winter Wren	*Troglodytes troglodytes*
Harlequin Duck	*Histrionicus histrionicus*	Sedge Wren	*Cistothorus platensis*
Black Scoter	*Melanitta nigra*	Marsh Wren *	*Cistothorus palustris*
Surf Scoter	*Melanitta perspicillata*	Golden-crowned Kinglet	*Regulus satrapa*
White-winged Scoter	*Melanitta fusca*	American Robin *	*Turdus migratorius*
Common Goldeneye	*Bucephala clangula*	Gray Catbird *	*Dumetella carolinensis*
Bufflehead	*Bucephala albeola*	Northern Mockingbird *	*Mimus polyglottos*
Hooded Merganser	*Lophodytes cucullatus*	Brown Thrasher *	*Toxostoma rufum*
Common Merganser	*Mergus merganser*	American Pipit	*Anthus rubescens*
Red-breasted Merganser	*Mergus serrator*	Cedar Waxwing	*Bombycilla cedrorum*
Ruddy Duck	*Oxyura jamaicensis*	European Starling *	*Sturnus vulgaris*
Black Vulture	*Coragyps atratus*	White-eyed Vireo *	*Vireo griseus*
Turkey Vulture	*Cathartes aura*	Blue-headed Vireo	*Vireo solitarius*
Bald Eagle	*Haliaeetus leucocephalus*	Yellow-throated Vireo *	*Vireo flavifrons*
Northern Harrier	*Circus cyaneus*	Warbling Vireo	*Vireo gilvus*
Sharp-shinned Hawk	*Accipiter striatus*	Philadelphia Vireo	*Vireo philadelphicus*
Cooper's Hawk	*Accipiter cooperii*	Red-eyed Vireo*	*Vireo olivaceus*
Red-shouldered Hawk *	*Buteo lineatus*	Ovenbird *	*Seiurus aurocapillus*
Broad-winged Hawk	*Buteo platypterus*	Northern Waterthrush	*Seiurus noveboracensis*
Red-tailed Hawk	*Buteo jamaicensis*	Louisiana Waterthrush *	*Seiurus motacilla*
Oldsquaw	*Clangula hyemalis*	Kentucky Warbler	*Oporornis formosus*
American Kestrel *	*Falco sparverius*	Connecticut Warbler	*Oporornis agilis*
Merlin	*Falco columbarius*	Mourning Warbler	*Oporornis philadelphia*
Peregrine Falcon	*Falco peregrinus*	Common Yellowthroat *	*Geothlypis trichas*

Common Name	Scientific Name	Common Name	Scientific Name
Northern Bobwhite *	*Colinus virginianus*	Hooded Warbler	*Wilsonia citrina*
Clapper Rail *	*Rallus longirostris*	Wilson's Warbler	*Wilsonia pusilla*
Virginia Rail *	*Rallus limicola*	Canada Warbler	*Wilsonia canadensis*
Sora	*Porzana carolina*	Yellow-breasted Chat *	*Icteria virens*
Common Moorhen	*Gallinula chloropus*	Summer Tanager *	*Piranga rubra*
American Coot	*Fulica americana*	Scarlet Tanager	*Piranga olivacea*
Black-bellied Plover	*Pluvialis squatarola*	Northern Cardinal *	*Cardinalis cardinalis*
Semipalmated Plover	*Charadrius semipalmatus*	Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Piping Plover *	*Charadrius melodus*	American Tree Sparrow	*Spizella arborea*
Killdeer *	*Charadrius vociferus*	Chipping Sparrow *	*Spizella passerina*
American Oystercatcher	*Haematopus palliatus*	Seaside Sparrow	*Ammodramus maritimus*
Greater Yellowlegs	*Tringa melanoleuca*	Fox Sparrow	*Passerella iliaca*
Willet *	*Catoptrophorus semipalmatus*	Song Sparrow *	*Melospiza melodia*
Spotted Sandpiper	*Actitis macularia*	Lincoln's Sparrow	*Melospiza lincolnii*
Whimbrel	*Numenius phaeopus*	Swamp Sparrow	*Melospiza georgiana*
Marbled Godwit	*Limosa fedoa*	White-throated Sparrow	*Zonotrichia albicollis*
Ruddy Turnstone	*Arenaria interpres*	White-crowned Sparrow	*Zonotrichia leucophrys*
Red Knot	*Calidris canutus*	Dark-eyed Junco	*Junco hyemalis*
Sanderling	*Calidris alba*	Lapland Longspur	*Calcarius lapponicus*
Semipalmated Sandpiper	*Calidris pusilla*	Snow Bunting	*Plectrophenax nivalis*
Western Sandpiper	*Calidris mauri*	Bobolink	*Dolichonyx oryzivorus*
Least Sandpiper	*Calidris minutilla*	Red-winged Blackbird *	*Agelaius phoeniceus*
Dunlin	*Calidris alpina*	Brown-headed Cowbird*	*Molothrus ater*
Short-billed Dowitcher	*Limnodromus griseus*	Orchard Oriole *	*Icterus spurius*
Long-billed Dowitcher	*Limnodromus scolopaceus*	Baltimore Oriole	*Icterus galbula*
Common Snipe	*Gallinago gallinago*	Purple finch	*Carpodacus purpureus*
American Woodcock	*Scolopax minor*	House Finch *	*Carpodacus mexicanus*
Laughing Gull	*Larus atricilla*	Pine Siskin	*Carduelis pinus*
Little Gull	*Larus minutus*	American Goldfinch *	*Carduelis tristis*
Bonaparte's Gull	*Larus philadelphia*	Evening Grosbeak	*Coccothraustes vespertinus*
Ring-billed Gull	*Larus delawarensis*	House Sparrow *	*Passer domesticus*

Source: U.S. Army 2000
*Breeding Species (in the region)

4.8.1.2.3 Reptiles and Amphibians

Various biological surveys report an absence of terrestrial amphibians and/or reptiles at Fort Monroe. Sea turtles were not included in the biodiversity report since no nesting habitat is found along Fort Monroe beaches, although they frequently wash up on the beach at Fort Monroe. While suitable sea turtle habitat exists on Fort Monroe, none have ever been observed on Fort Monroe (U.S. Army 2000).

4.8.1.2.4 Fish

During the 1998 USFWS Biological Diversity Survey, a total of 19 species of fish were found in the high-salinity waters of Mill Creek adjacent to Fort Monroe (see Table 4.8-5). The area is a suitable nursery and spawning habitat for anadromous fish (U.S. Army 2000).

Table 4.8-5 Fish and Shellfish Collected at Mill Creek at Fort Monroe

Common Name	Scientific Name
Fish	
Broad Stripe Anchovy	*Anchoa hepsetus*
Bay Anchovy	*Anchoa mitchilli*
Silver Perch	*Bairdiella chrysoura*
Spotted Sea Trout	*Cynoscion nebulosus*
Spot	*Leiostomus xanthurus*
Atlantic Croaker	*Micropogonias undulatus*
Atlantic Menhaden	*Brevoortia tyrannus*
Gizzard Shad	*Dorosoma cepedianum*
Sheepshead Minnow	*Cyprinodon variegatus*
Mummichog	*Fundulus heteroclitus*
Striped Killifish	*Fundulus majalis*
Naked Goby	*Gobiosoma bosci*
Atlantic Silverside	*Menidia menidia*
Striped Bass	*Morone saxatilis*
White Mullet	*Mugil curema*
Pigfish	*Orthopristis chrysoptera*
Summer Flounder	*Paralichthys dentatus*
Atlantic Needlefish	*Strongylura notata*
Inshore Lizardfish	*Synodus foetens*
SHELLFISH	
Blue Crab	*Callinectes sapidus*
Oyster	*Crassostrea virginica*
Source: U.S. Army 2000	

There is fish habitat for waters within the Chesapeake Bay from Old Point Comfort on the south, north to the Back River Inlet, and up to Drum Point at the Drum Island Flats for the following fish species: windowpane flounder (*Scopthalmus aquosus*), bluefish *(Pomatomus saltatrix),* Atlantic butterfish *(Peprilus triacanthus),* summer flounder *(Paralicthys dentatus),* black sea bass *(Centropristus striata),* king mackerel *(Scomberomorus cavalla),* Spanish mackerel *(Scomberomorus maculatus),* cobia *(Rachycentron canadum),* red drum *(Sciaenops occelatus),* dusky shark *(Charcharinus obscurus),* and sandbar shark *(Charcharinus plumbeus)* (U.S. Army 2000).

4.8.1.3 Sensitive Species

Section 7(a)(2) of the ESA (87 Stat. 884;16 U.S.C 1531 et seq.) requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any federally listed threatened or endangered species or result in the destruction or adverse modification of designated critical habitat. In the event that a federal agency determines that its action "may affect" a listed threatened or endangered species or designated critical habitat, the agency is required to consult with the USFWS and/or the National Marine Fisheries Service (NMFS) regarding the degree of impact and measures available to avoid or minimize the adverse effects. If any federally listed or proposed species is documented or any federally designated critical habitat is established that may be affected by a proposed project, then formal consultation with the USFWS and/or the NMFS is required.

Coordination letters were sent to the NMFS and the USFWS Virginia Field Office in Gloucester requesting a list of federally listed threatened, endangered, or candidate species, as well as sensitive species known to occur or potentially occurring on or in the vicinity of Fort Monroe (see Appendix E). Letters were also sent to the VDCR, Virginia Department of Game and Inland Fisheries (VDGIF), and VDEQ requesting information on state-listed threatened, endangered, or candidate species, as well as sensitive species known to occur or potentially occurring, on or in the vicinity of Fort Monroe (Appendix E). VDCR maintains the Virginia Natural Heritage Resources Information database that tracks the locations of state- and federally-listed species for the Commonwealth of Virginia, which was also reviewed (VDCR 2009a).

No federally listed endangered or threatened species were identified at Fort Monroe during 1998 and 2003 USFWS surveys. Furthermore, no federal or state-listed species were identified as being present on Fort Monroe that would be adversely affected by the proposed project as indicated by VDCR (see Appendix E). The yellow-crowned night-heron (*Nyctanassa violacea violacea*) is listed by VDGIF as a State Special Concern (SSC) species and is known to nest in many trees across the installation (VDGIF 2009; VDCR 2009a; U.S. Army 2000, 2006a). Other state-listed species that have been recorded as being observed at Fort Monroe include the great egret (Area alba), bald eagle (*Haliaeetus leucocephalus*), black skimmer (*Rynchops niger*), peregrine falcon (*Falco peregrinus*), least tern (*Sternula antillarum*), gull-billed tern (*Gelochelidon nilotica*), and piping plover (*Charadrius melodus*). Fort Monroe does not have federally designated critical habitat for any protected species. The piping plover is also a federally-listed threatened (FT) species that is known to nest periodically in the City of Hampton and York

County. However, piping plovers do not nest at Fort Monroe. Although piping plovers do breed in the region during the spring, sightings of piping plovers on Fort Monroe are reported as being "rare", with typically only a single observation over a two to three year period during the spring, and one to five annual observations during the summer and fall (U.S. Army 2000, USFWS 1998). The peregrine falcon and bald eagle were removed from the federal list of threatened and endangered species, although both species are state-listed threatened species. Both have been designated as a federally recovered species and are currently being monitored throughout their range. It should be noted that many of the state-listed species mentioned above migrate to and from suitable habitat, which may or may not comprise land associated with Fort Monroe.

Although the state endangered canebrake rattlesnake (*Crotalus horridus atricaudatus*) and the threatened Mabee's salamander (*Ambystoma mabeei*) have been identified in the City of Hampton, neither of these species was found during the USFWS surveys (1998) on Fort Monroe.

In terms of aquatic life, there are three sea turtles that are state- and federally-listed species that occur in the Chesapeake Bay off of Fort Monroe, including: Kemp's ridley sea turtle (*Lepidochelus kempii*) (federally endangered [FE], state endangered [SE]), leatherback sea turtle (*Dermochelys coriacea*) (FE, SE), and the loggerhead sea turtle (*Caretta caretta*) (FT, state threatened [ST]). There are no records of nesting of any of these turtles on Fort Monroe. However, dead sea turtles have washed up on the shores of Fort Monroe in the past. State- and federally-listed fish species include the shortnose sturgeon (*Acipenser brevirostrum*) (FE, SE) and Atlantic sturgeon (*Acipenser oxyrhunchus*) (species of special concern [SC]). In one instance, a dead Atlantic sturgeon washed up on the shores of Fort Monroe. These species are known to be in the Chesapeake Bay, but they are rare (U.S. Army 2006a).

Four species of moths listed as rare by the Commonwealth of Virginia may be present on Fort Monroe. There are approximately 500 live oaks on Fort Monroe and oak metria moth (*Metria amella); orange panapoda (Panopoda repanda),* prominent moth (*Heterocampa astarte)*, and *Cymatophora approximaria*, are known to feed extensively on these trees during their larval phase. *Cymatophora approximaria* also feeds on greenbrier (*Smilax sp*.) and ciliate meadow-beauty (*Rhexia petiolata*). A survey has not been conducted to confirm the presence or absence of any of these rare moth species. According to VDCR, no listed threatened or endangered insects or plants are found within the project site (see letter responses from VDCR found in Appendices A and E).

4.8.1.4 Migratory Bird Treaty Act (MBTA) of 1918

Many birds seen at Fort Monroe are protected by the MBTA, with which Fort Monroe is compliant. This includes management of non-migrant Canada geese (*Branta canadensis*). Only one migratory bird breeding species found at Fort Monroe carries a *SC* status by VDGIF, the yellow-crowned night-heron (VDGIF 2009, VDCR 2009a). The species prefers fresh and brackish waters and salt marshes, forages in shallow waters, migrates into the area in early spring, breeds mid-spring through mid-summer, and migrates out of the area in the fall, since it is not a winter resident. The yellow-crowned night-heron's diet is

composed mostly of crustaceans. The yellow-crowned night-heron nests in trees throughout Fort Monroe. Other migratory birds include great blue herons (*Ardea herodias*), ospreys (*Pandion haliaetus*), all types of waterfowl, and several pairs of northern American kestrels (*Falco sparverius* spp.).

4.8.1.5 Wetlands

"Wetlands" is a collective term for marshes, swamps, bogs, and similar areas characterized by perennial water-saturated soils and are vegetated with plants that have adapted to these conditions. Wetlands may exist in poorly drained areas, in depressions on the landscape, and between water and dry land along the edges of streams, rivers, lakes, and coastlines. Inland wetlands receive water from precipitation, ground water, and/or surface water. Coastal and estuarine wetlands receive water from precipitation, surface water, tides, and/or groundwater. Surface water sources include storm water runoff.

As shown in Figure 4.8-1, Fort Monroe has a small tidal marsh area located at the northern extremity of the installation that is associated with Mill Creek. This tidal marsh area covers approximately 85 acres, of which 53 acres are within Fort Monroe's boundaries. It has been classified as Group One, the highest quality and most ecologically productive wetland, and is dominated by salt-marsh cord grass. Overall, Fort Monroe has 63 acres of wetlands, including both tidal and non-tidal wetlands.

Wetlands located within the boundary of Fort Monroe are part of the larger estuarine wetland system of the Chesapeake Bay area. Development, infilling, and drainage have resulted in historic loss of this important wetland resource. It is estimated that since 1780 over 40 percent of the wetlands within the Chesapeake have been lost (USGS 2009). Actions that affect wetlands in this area are regulated under Section 404 permitting authority administered by the USACE, Norfolk District and by the Commonwealth of Virginia under the VWPP program. Under Virginia Code §62.1-44.15:5, the permit would be required from the VDEQ Tidewater Regional Office and a Joint Permit Application would be submitted to the VMRC, which would also involve VDEQ, the USACE, and the local wetlands board. The VWPP program requires that all wetlands be delineated and not only those considered jurisdictional by the USACE. Virginia regulations also allow for local governments to establish citizen advisory groups to assist in wetlands protection measures, as well as institute local zoning ordinances to protect tidal wetlands (USGS 2009).

Wetlands and coastal riparian habitat are also protected under the CBPA, as previously discussed in Section 4.7. The act establishes Resource Protection Areas (RPA) to protect coastal habitat and water quality. RPAs have been established as a 100-foot buffer zone along the boundary of Fort Monroe. In general, most development is not permitted within the RPA, although there are some types of development that are exempt (e.g., water dependent activities such as a marina, docks, piers; certain types of redevelopment). In addition, there are administrative procedures for considering encroachment waivers within the RPA, which are administered and reviewed by local boards that manage the RPAs (VDCR 2009b). Such restrictions and procedures apply to both baseline conditions under

which Fort Monroe currently operates, as well as future use of the installation by other entities.

Figure 4.8-1 Wetlands and Sensitive Habitat

4.8.2 Consequences

4.8.2.1 Early Transfer Disposal Alternative

***Direct*.** Long-term minor to moderate adverse impacts would be expected. In the near-term, no effects are expected from the manner in which early transfer disposal occurs (i.e., as separate parcels or as one parcel; leasing strategies); however, such activities may affect the timing, duration, and short-term intensity of effects associated with non-federal ownership and redevelopment. In the long-term, redevelopment activities at Fort Monroe will principally focus on renovation of existing structures located within highly disturbed areas, as well as limited expansion of development and impervious surface (e.g., in North Gate and the Wherry Housing Quarter). Based on an analysis of conceptual development plans from the Reuse Plan, aerial photography analysis, and building metrics from Table 3.3-3; changes in habitat conditions, green space, and impervious surface were estimated for the range of redevelopment scenarios that would occur following transfer (see Section 4.8.2.5 for further discussion). Overall, it was estimated that impervious surface would increase from 24 percent (baseline conditions) to 28 percent at full build-out. Following property transfer, up to 100 acres may ultimately be disturbed from redevelopment, spread over the course of 20 years. Of this acreage, only a quarter is open green space which would be lost to development, with virtually no loss in natural habitat (i.e., all the open areas to be disturbed consist of highly disturbed open fields with vegetation control). There are mature trees that may need to be removed or disturbed by specific building foot prints, but overall, redevelopment will include replanting and preservation of existing trees. In addition, most of the large mature trees are located in areas that will not involve expanded construction foot prints (e.g., historic district area). Therefore, impacts to existing trees will be minimal. If a northern entrance is constructed at some point, less than 1 acre of tidal wetlands habitat would be disturbed for road and bridge construction in order to connect Fenwick Avenue to the corner of Atlantic Avenue and Bay Shore Lane (see Section 4.8.2.5 for further discussion). Given the very limited use of the impacted areas, their highly disturbed nature, and the timing for redevelopment (over a 20 year period), early transfer of the property will generate minor adverse effects to biological resources. Beginning with construction of the present-day fortress, the installation's landscape has been highly manipulated and is now surrounded by highly developed residential and industrial areas. Impacts caused by the physical changes from redevelopment would alter minimal natural processes and habitats in only minor ways compared to the existing condition (see Section 4.8.2.5 for further discussion). Thus, minor adverse effects would be expected to terrestrial biological resources due to reductions in existing open space (up to a 10 percent loss in green open space), increases in impervious surface (up to a 4 percent increase in impervious surface), and removal of trees. Furthermore, no federal or state-listed species were identified as being present on Fort Monroe that would be adversely affected by the proposed project as indicated by VDCR (see Appendix E). VDCR further indicated that they did not anticipate any adverse impacts from the proposed action to natural heritage resources, which includes unique or exemplary natural communities, and state Natural Area Preserves.

With respect to aquatic resources, minor to moderate local adverse effects are expected. Increases in impervious surface (from 24 percent to 28 percent), marina expansion (up to

a 30 percent increase, which will include disturbance of bottom sediments for construction of up to 5 docks for up to 100 additional boats), and soil disturbing activities on-site will increase stormwater runoff and degrade to some degree aquatic habitat in the immediate vicinity of outfalls and areas adjacent to the shoreline (particularly above the existing marina area where a marina expansion is planned). These activities will be subject to permitting requirements and Virginia requirements for SWM and discharge permits (Virginia SWM Act §10.1-603.3 and Virginia Stormwater Management Program [VSMP] General Permit requirements) and surface water encroachment permits administered by VMRC in accordance with Virginia Code §28.2-1204. Furthermore, increased traffic (more than doubling of road traffic) and impervious surface may slightly degrade water quality of stormwater runoff, thereby impacting aquatic life in the portion of waterbodies immediately adjacent to Fort Monroe (i.e., Mill Creek to the west, Chesapeake Bay to the east, and Hampton Roads Harbor to the south). Adherence to BMPs for erosion and stormwater control, and regulatory controls (e.g., for marinas and outfalls) will ensure that impacts to aquatic life are not significant.

Indirect. No indirect impacts would be expected.

4.8.2.2 Traditional Disposal Alternative

***Direct*.** Long-term minor to moderate adverse impacts would be expected. Effects similar to those described in the early transfer alternative would be expected to occur, but farther in the future.

Indirect. No indirect impacts would be expected.

4.8.2.3 Caretaker Status Alternative

Direct. Short-term minor beneficial and adverse impacts would be expected. Reduced human activity and reduced mowing and trimming of landscapes would provide overall beneficial effects to biological resources by making the installation more attractive to wildlife. In addition, future military activities would cease and new construction activities and ground disturbing activities would not be conducted. Therefore, minor beneficial effects would be realized relative to baseline status-quo conditions in terms of reduced human occupation and elimination of project activity. As a result of reduced human presence, birds and mammals would utilize the installation property more relative to baseline conditions. Birds would be first to take advantage of the opportunity, but eventually small mammals would find access through available land crossings. On the downside, active natural resource management activities would not be implemented. Thus, invasive species management, tree management, and pest management activities would not occur under caretaker status. Minor adverse effects to these resources may therefore occur.

Indirect. No indirect impacts would be expected.

4.8.2.4 No Action Alternative

Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations

for closure and realignment. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.8.2.5 Intensity-Based Probable Use Scenario

Lower Bracket, Direct. Long-term minor beneficial impacts would be expected. Based on an analysis of changes in on-site population and associated traffic between baseline conditions and the Lower Bracket scenario (using metrics from Table 3.3-3 and tourism and traffic estimates discussed in Section 4.11), minor beneficial effects to biological resources will occur. The Lower Bracket scenario would result in reduced traffic (half the traffic relative to baseline conditions), reduced human presence (one-third of the on-site population, when considering changes in employment, residential population, and tourism), slight decreases in impervious surfaces (removal of a small number of isolated structures, unused parking areas, and airstrip), and slight increases in open space and acreage available for habitat restoration (e.g., removal of the airstrip). As a result of reduced human presence, birds and mammals would utilize the installation property more relative to baseline conditions.

Lower Bracket, Indirect. No indirect impacts would be expected.

Middle Bracket, Direct*.* Long-term minor to moderate adverse impacts will occur. Minor adverse effects would be expected to terrestrial biological resources due to reductions in existing open space (up to a 5 percent loss in green open space), increases in impervious surface (up to a 3 percent increase in impervious surface), increased human occupation (40 percent increase from baseline conditions), and potential removal of some trees. Beginning with construction of the present-day fortress, the installation's landscape has been highly manipulated and is now surrounded by highly developed residential and industrial areas. Impacts caused by the physical changes from redevelopment would alter natural processes and habitats in only minor ways compared to the existing condition, as discussed further below. With respect to increased human activity, it is estimated that there will be a net increase in population of 40 percent above baseline conditions (factoring in increased residential occupation, reduced worker population, increased tourism) and an increase in traffic by as much as 2.3 times baseline levels. However, given the limited biological resources on-site and the highly developed nature of the area, this increase in human activity will only have a minor adverse effect on the wildlife that currently utilize Fort Monroe. Furthermore, no federal or state-listed species were identified as being present on Fort Monroe that would be adversely affected by the proposed project as indicated by VDCR (see Appendix E). VDCR further indicated that they did not anticipate any adverse impacts from the proposed action to natural heritage resources, which includes unique or exemplary natural communities, and state Natural Area Preserves.

Based on the Reuse Plan, aerial photography analysis, and building metrics from Table 3.3-3, changes in habitat conditions, green space, and impervious surface were estimated for the Middle Bracket scenario. As outlined in the Reuse Plan, most of the redevelopment involves renovation and redevelopment of highly disturbed areas, with some infilling and expansion of development. Utilizing conceptual renderings of redevelopment and aerial

photography analysis of existing conditions, it was estimated that impervious surface would increase from 24 percent (baseline conditions) to 27 percent at full build-out for the Middle Bracket Scenario; approximately a 12 acre net increase in impervious area. This estimate includes removal of some existing impervious surface in the lower fort area, as well as the air strip area. In addition, there is estimated to be a loss in approximately 15 acres of open green space; however, less than 1 acre of this consists of natural wildlife habitat (i.e., for the construction of a northern entrance). Overall, approximately 85 acres of land may ultimately be disturbed from redevelopment, spread over the course of 20 years. As previously discussed, only 15 acres of this area is currently considered green open space, which consist of highly disturbed open fields with vegetation control. The remaining area (~70 acres) consists of existing developed areas which include existing building structures, parking lots, and lawn areas adjacent to or between developed areas. The disturbed areas will include isolated project footprints that may range from a quarter acre to up to 10 acres in size (e.g., removal of the airstrip). On average the area of disturbance is estimated to be less than 5 acres per year over the total build-out period. The construction activities will also occur within highly developed areas; therefore disturbance to wildlife would be minimal. Thus, these land disturbing and development activities will have a minor adverse impact on terrestrial biological resources.

Due to redevelopment actions, there are mature trees that may need to be removed or disturbed by specific projects. However the vast majority of the large mature trees that are present on Fort Monroe are located in areas that will not be redeveloped, including the street lined roadway network of the historic village area, the Parade Grounds within the old fort, and in the northern reaches of the undeveloped portion of Fort Monroe. Projects in the lower fort in these locations mainly involve renovation of existing buildings. Although the trees will be preserved in these areas, it is possible that infill development or certain infrastructure projects may require the disturbance of a few trees in certain locations. Areas in North Gate and the Wherry Quarter, which may undergo development, have very few mature trees vulnerable to disturbance. Following redevelopment, tree plantings along roads within the North Gate and Wherry Quarter areas will increase the overall number of trees on Fort Monroe. Therefore, impacts to existing trees will be minimal. Any removal or alteration of the batteries, bunkers, seawall or breakwaters has the potential to adversely affect the beach profile, the beach fauna, and the native grasses along the Chesapeake Bay shoreline from the Wherry Quarter to the northern limit of the installation.

When the northern entrance is constructed for vehicular traffic, less than 1 acre of tidal wetlands habitat (and potentially less than a half acre) would be disturbed for roadway and bridge construction in order to connect Fenwick Avenue to the corner of Atlantic Avenue and Bay Shore Lane. This acreage represents less than two percent of the wetlands on Fort Monroe, and less than one percent of the tidal wetlands in Mill Creek. To avoid or minimize adverse impacts to this sensitive resource, project-specific wetlands delineation, permitting, and wetlands avoidance and/or mitigation requirements will be conducted prior to construction, in consultation with the USACE, Norfolk District and the VWPP Program as previously discussed. As required under Section 404 of the CWA, the sequencing of mitigation requirements will ensure that impacts will be avoided if possible, then minimized if unavoidable, and as a last resort mitigated through creation, restoration, banking and

other means in consultation with USACE, Norfolk District. Given the wetland mitigation requirements outlined above and the very small project foot print, it is estimated that only minor adverse impacts to wetlands will occur.

With respect to aquatic resources, minor to moderate local adverse effects are expected. Increases in impervious surface (from 24 percent to 27 percent), marina expansion (up to a 30 percent increase), and soil disturbing activities on-site will increase stormwater runoff and degrade to some degree aquatic habitat in the immediate vicinity of outfalls and areas adjacent to the shoreline (particularly above the existing marina area where a marina expansion is planned). Furthermore, increased traffic (more than doubling of road traffic) and impervious surface may slightly degrade water quality of stormwater runoff, thereby impacting aquatic life in the portion of waterbodies immediately adjacent to Fort Monroe (i.e., Mill Creek to the west, Chesapeake Bay to the east, and Hampton Roads Harbor to the south). However, long-term estimates of impervious surface at Fort Monroe are still well below estimates within the nearby community of Phoebus, where impervious surface is estimated to be over 50 percent. Thus, the change in impervious surface from 24 percent to 27 percent is considered a long-term minor adverse effect. Furthermore, adherence to BMPs for erosion and stormwater control, and regulatory controls (e.g., for marinas and outfalls previously discussed) will ensure that impacts to aquatic life are not significant.

Marine-related construction projects and ground disturbance could increase erosion, adversely affecting aquatic resources, including adjacent fish habitat. Potential expansion of the marina, by as much as 30 percent, could have a moderate short-term adverse impact on local aquatic life (due to the disturbance of aquatic habitat from the construction of up to 4 new docks for up to 80 boat slips for the Middle Bracket scenario), and a long-term minor adverse impact (due to the increased marina and nearby parking activities). The shallow nature of the water in the area proposed for expansion and economic viability (once rates are set to regional levels) makes the potential for expansion uncertain. In any event, marina expansion is considered a minor to moderate adverse effect due to the small size of the expansion project (less than 1 acre of total area of river bottom shaded by docks and new boats) and the regulation of such activities through the VSMP General Permit program and VSMP surface water encroachment permitting process administered by VMRC in accordance with Virginia Code §28.2-1204. With respect to erosion potential, soil disturbance for individual projects could range from just a quarter acre to 10 acres (e.g., removal of the airstrip); with approximately 85 acres disturbed over the course of the 20 year build-out (i.e., less than 5 acres per year on average). In each case, required erosion and stormwater control measures would be implemented to limit surface water runoff to reduce affects on nearby aquatic life. Given the small size of these individual project footprints and implementation of required erosion and stormwater control measures, these effects are considered to be minor. Overall, VDGIF finds the reuse proposal as “consistent with the fisheries management enforceable policy of the Virginia Coastal Resources Management Program” (see VDEQ letter dated 6 November 2009, Appendix A). Through long-term implementation of the Reuse Plan, additional resources may be available to renovate substandard wastewater and stormwater discharge pipe networks which will provide some long-term benefit to water quality and aquatic life.

***Middle Bracket, Indirect*.** No indirect impacts would be expected.

Upper Bracket, Direct. Long-term minor to moderate adverse impacts would be expected. Adverse effects similar to those discussed under the Middle Bracket scenario would be expected, but to a slightly greater degree. The Upper Bracket scenario will result in an increase of an additional 200 residential units and over 1,000 more employees above the Medium Bracket scenario. This increase in intensity would result in a 10 percent loss in green space from baseline conditions (double the loss estimated for the Middle Bracket), 100 acres of disturbed ground (15 more acres than the Middle Bracket scenario, principally in the Wherry Housing area), 4 percent increase in impervious surface above baseline, (1 percent more than the Middle Bracket Scenario), and 5 docks for supporting 100 boats (1 additional dock for 20 more boats than estimated for the Middle Bracket scenario, approximately 1 acre of total area of river bottom shaded by docks and new boats), and nearly twice the on-site population (when considering employment, residential units, and tourism, a ~25 percent increase in population above the Middle Bracket scenario) relative to baseline conditions. In general, the Upper Bracket scenario represents minor increases in intensity above the Middle Bracket scenario. Principally these effects would be seen in the Wherry Housing area were additional green space would be lost due to redevelopment in this area. No additional loss in wetlands would occur from the Upper Bracket scenario, relative to the Middle Bracket scenario. Furthermore, no federal or state-listed species were identified as being present on Fort Monroe that would be adversely affected by the proposed project as indicated by VDCR (see Appendix E). VDCR further indicated that they did not anticipate any adverse impacts from the proposed action to natural heritage resources, which includes unique or exemplary natural communities, and state Natural Area Preserves.

Upper Bracket, Indirect. No indirect impacts would be expected.

4.9 CULTURAL RESOURCES

4.9.1 Affected Environment

This section addresses federal statutes, regulation, E.O.s, and memoranda applicable to the management of historic properties and operation of Fort Monroe. Sections 106 and 110 of the NHPA (Pub. L. 88-655, 16 U.S.C §470 et seq.) ensure that federal agencies consider cultural resources, defined as any prehistoric or historic district, site building, structure or object eligible for inclusion on the NRHP, in their proposed program, projects, and actions prior to initiation. For Fort Monroe, a PA for the closure and disposal was finalized and signed in June 2009. The PA and its requirements are discussed in more detail below and the entire PA is provided in Appendix F.

4.9.1.1 Prehistoric and Historic Background

Prehistoric Context. The prehistory of the area that is today Fort Monroe is divided by archaeologists into three time periods: Paleo-Indian (approximately [ca.] 11,000 years before present [BP]–ca. 10,000 BP), Archaic (ca. 10,000–ca. 3,000 BP), and Woodland (ca. 3,000 BP–400 BP).

Paleo-Indian Period (ca. 11,000 BP –ca. 10,000 BP). The first evidence of humans in the region surrounding Fort Monroe dates to ca. 11,000 BP These nomadic people probably traveled in family groups, hunting wild animals and collecting plants to be used for food and to be crafted into structures and tools. Paleo-Indian archaeological sites are identified by a distinct fluted spear point. One Paleo-Indian site has been identified in Sussex County, approximately 30 miles west of Fort Monroe. No Paleo-Indian sites have been found at Fort Monroe (McDaid and Schenian 2003).

Archaic Period (ca. 10,000 BP–ca. 3,000 BP). The Archaic Period is subdivided into three periods, the Early Archaic Period (ca. 10,000 BP -ca.8,000 BP); the Middle Archaic Period (ca. 8,000 BP – ca. 5,000 BP); and the Late Archaic Period (ca. 5,000 BP – ca. 2,000 BP). These sub-periods are based on changes in the types of tools and other artifacts people used. During the Archaic Period the climate became warmer and the glaciers retreated, creating streams and rivers. As a result the vegetation and fauna in what is now southern Virginia changed. Rising sea level and these newly formed sources of fresh water also submerged the ancient Susquehanna River Valley, which became the modern Chesapeake Bay. New foodstuffs, such as shellfish, became abundant, and remains of hickory nuts, butternuts, amaranth, and chenopod suggest a new cuisine based on these resources. The population increased as people adapted to their new surroundings throughout this time. Sites found during the Late Archaic Period range from very large to small camp-type sites. No Archaic Period sites have been found at Fort Monroe (McDaid and Schenian 2003).

Woodland Period (ca. 3,000 BP–ca. 400 BP). The Woodland Period is divided by archeologists into three periods: Early (ca. 3,000 BP – ca. 2,300 BP); Middle (ca. 2,300 BP – ca. 1,050 BP); and Late (ca. 1,050 BP – ca. AD 400). The Woodland Period is identified primarily by the introduction and widespread use of true, fired-ceramic vessels, the invention of agriculture, and the introduction and spread of the bow and arrow. Large

villages and the introduction of full-scale agriculture are hallmarks of this time period, leading to the conclusion that this period saw a substantial population increase. Archaeological evidence suggests that during the Early Woodland Period people collected shellfish and seed plants on a more intensive basis. During the Middle Woodland Period people began to rely more on predictable foodstuffs, including manipulating and promoting the growth of specific plants. Shellfish and anadromous fish were also caught and gathered in increasing frequency. By the Late Woodland Period the horticultural society was transformed into a more complex society that relied increasingly on large-scale agriculture, based on archaeological evidence for increases in the use of hoes for farming and grinding tools to process foodstuffs. Agricultural crops were complemented by food caught and collected in the wild, including turkey and duck. There are three Woodland Period loci (discrete excavated unit or point of archaeological context) at Fort Monroe. Locus 11 and a portion of locus 20 (both Late Woodland) are eligible, and locus 8 (Middle Woodland) is not eligible, for listing on the NRHP (McDaid and Schenian 2003). During the period when the English entered the Chesapeake Bay, the large village of Kecoughtan was located nearby, where the Veteran's Administration Hospital is now located (McDaid and Schenian 2003).

Historic Context. The Virginia Department of Historic Resources (VDHR) divides the history of Virginia into eight historic periods. These are: Settlement to Society (1607–1750); Colony to Nation (1750–1789); Early National Period (1789–1830); The Antebellum Period (1830–1860); The Civil War (1860–1865); Reconstruction and Growth (1866–1917); World War I (WWI) to World War II (WWII)(1917–1945); and the New Dominion period (1945–Present). In addition to the VDHR historic context, three other contexts have been developed for the historic properties at the fort. These are, first, the historic context developed for the Fort Monroe Historic American Building Survey/Historic American Engineering Record (HABS/HAER) study (DOI 1987); second, the context developed for the *Historic Architecture Repair and Maintenance Plan* (HARAM) (J.M. Waller Associates 2001); and third, a nationwide context developed for DoD. These contexts are shown in Table 4.9-1. The periods set out in the HARAM are used here for the above-ground resources. The HARAM system divides the buildings at Fort Monroe into three time periods, the Federal Period (1819–1860); the National Period (1861–1929); and the Modern Period (1930–1961). The VDHR contexts are used here for the Historic Period archaeological sites and the historic context of Fort Monroe.

Table 4.9-1 Historic Contexts for Fort Monroe

VDHR	HARAM	HABS/HAER	DoD
Settlement to Society (1607-1750)			The Military in the Early Republic and Antebellum Era (1790-1860)
Colony to Nation (1750–1789)			
Early National Period (1789–1830)	Federal Period (1819-1860)	Construction Period (1819-1860)	
Antebellum Period (1830–1860		Civil War Era (1861-1865)	
The Civil War (1860–1865)	National Period (1861–1929)	Post-Civil War Expansion (1866-1899)	The Civil War and National Expansion (1860-1890)
Reconstruction and Growth (1866–1917)		Early 20th-century Development (1900-1929)	
WWI to WWII (1917–1945)	Modern Period (1930–1961)	Depression/WWII Development (1930-1945)	The Military and the Progressive Era (1890-1918)
New Dominion Period (1945–Present)		Post WWII Development (1945-1987)	The Inter-War Years (1918-1940)
Source: McDaid and Schenian 2003			

Settlement to Society (1607 [1570] to 1750). The Native Americans that lived in the area that now includes Fort Monroe were the Powhatan Indians, believed to be part of the larger groups that spoke an Algonkian language. Among the earliest known non-Native people to set foot in the region that now includes Fort Monroe were Spanish Jesuits who arrived in 1570 and established a mission among the Powhatan Indians. Eight Jesuits, led by Father Juan Baptista de Segura, traveled from Santa Elena, what is today the area just north of St. Augustine, Florida, and arrived at what they called Ajacán, on the York River. Its location remains unknown. The next year, 1571, the Jesuits were killed by the Indians; there was one survivor, a boy, who provided an eye-witness account (DOI 2008; Lewis and Loomie 1953). Over 30 years later, in April 1607, three English ships arrived at the mouth of the Chesapeake Bay. These were the *Discovery, Godspeed,* and *Susan Constant,* which stopped and provided the English name “Point Comfort,” and later “Old Point Comfort.” The English colony established a small, stockaded, earthwork fort, Fort Algernon, in 1609 that stood until 1612 when it burnt to the ground (McDaid and Schenian 2003). Three wars, known as the Anglo-Powhatan Wars, were fought between the English and the Powhatans. The first was from 1609 or 1610 to 1614; the second, from 1622 to 1632 and the last, in which the Indians were decisively defeated, was fought between 1644 and 1646 (Rountree 1996). The destruction of the Native American village of Kecoughtan by Jamestown colonists, in 1610, effectively ended any major Native American presence near Fort Monroe.

In August 1619 the first Africans, identified as '20 and odd Negroes,' disembarked at Point Comfort. These people appear to have become either indentured servants or slaves. Beginning in 1622 the Virginia House of Burgesses codified slavery in a series of laws.

The next fort to be built was completed in 1632. It was a more substantial wood fort, and is referred to as "the Fort at Old Point Comfort." This fort was supposed to be maintained by taxes on all incoming ships' cargos and all immigrants' first crops. However, many found ways to avoid paying the tax and so the fort often had no source of funding, often falling into disrepair (Weinert and Arthur 1989). In 1667, the fort was destroyed by a hurricane, and in part because of the lack of funding for construction and maintenance the fort was not rebuilt. In the early-18th century, war raged in Europe and the Virginia colonists, fearing attack, built a new fort. This brick fortification was named Fort George and stood from 1728 to 1749, when it, too, was destroyed by a hurricane.

Colony to Nation (1750 to 1789). There is little evidence of significant activity in the area of Fort Monroe during this time period. Archival evidence suggests that wooden buildings within the destroyed Fort George survived and were used by soldiers until the 1770s. It is worth mentioning that although no major fortification activity occurred at Old Point Comfort in the period, by 1775 a man was hired to care for the ruins and keep a light for ships, which became the forerunner to the Old Point Comfort lighthouse. In 1781, French soldiers erected a battery among the ruins of Fort George during the Battle of Yorktown (McDaid and Schenian 2003).

Early National Period (1789 to 1830). Fort Monroe was established during this period. The fort was named after President James Monroe. Construction lasted from 1819 to 1834, with the labor force consisting in large part of slaves from nearby plantations. The fort was designed personally by Brigadier General Simon Bernard, a brilliant French officer and engineer who designed the system of forts known as 'the Third System.' The 'Third System' was established by the Board on Fortifications under the leadership of Bernard, and was a cooperative effort. The forts were constructed from Maine to Louisiana following the War of 1812 (Fort Monroe, no date a, b). During that war, British forces had been able to attack the nation's capital, Washington, DC, and had also attempted to attack Norfolk, but were stopped on Craney Island by American forces, only to occupy the area of Old Point Comfort. After the war the new defense policy was implemented, calling for the construction of major fortifications at the nation's key harbors. Fort Monroe became the largest fortification in the coastal defense system (DOI 1987). In 1824, the Army established the Artillery School of Practice at Fort Monroe. The construction of the fort and the establishment and operation of the school occupied the remainder of the Early National Period (McDaid and Schenian 2003).

There are ten Army-owned buildings from this period still standing: Buildings 1, 2, 17, 18 (the Tuileries, built in 1823), 20, 21, 23, 48, and 216. The Old Point Comfort Lighthouse[4], was built in 1802 by the USCG, which still owns and operates it. The Lighthouse itself is a separate historic property listed on the NRHP, and located within the Fort Monroe NHL.

The Antebellum Period (1830 to 1860). The thirty-year period before the Civil War was one of almost continuous activity at Fort Monroe. The Artillery School was operational until it was suspended on 19 April 1834. However, it was re-formed in January 1858 for heavy guns (DOI 1987). Units from the post were involved in four different conflicts: the Nat Turner Rebellion in 1831, the Black Hawk War in 1832, the Seminole War (1835–1840), and the Mexican-American War (1845–1847). In June 1833 Chief Black Hawk and other tribal leaders were imprisoned at Fort Monroe for a few weeks. During this period the Fort also became one of the largest arsenals in the country.

The Antebellum period covers the last 30 years of the HARAM's Federal Period. Two extant buildings from this period, Building 50 and Building 166 (The Chapel of the Centurion, consecrated in 1858), and eight loci with components dating to this period remain. The archaeological loci with antebellum components include loci 1, 3, 4, 6, 10, 17, 19, and 20. Of these, loci 3, 4, 6, 10, and 19 have been listed as NRHP-eligible, loci 1 was deemed ineligible, part of loci 20 was found ineligible and another part has yet to be determined, and no determination of eligibility has been made for loci 17.

The Civil War (1860 to 1865). Fort Monroe played an offensive strategic and decisive role in the Civil War (DOI 1987). The Confederates never attacked the fort. In March 1861 the fort received the "Lincoln Gun," which remains on the grounds. The gun was a prototype 15-inch Rodman smooth bore gun (DOI 2008). The first battle of ironclad ships (the *Monitor* and the *Virginia* [formerly the *Merrimack]*) was fought here, on 9 March 1862. During this time Fort Monroe received its nickname of "Freedom's Fortress," when several slaves escaped from nearby Hampton to Fort Monroe, on 23 May 1861 (DOI 2008). Major General Benjamin Butler refused to surrender these people to Confederate troops, declaring them to be contraband of war. As a result, word spread that any slave reaching Fort Monroe would not be returned to slavery (McDaid and Schenian 2003). In December 1863 the 2nd Regiment Cavalry was organized at the fort as a regiment of U.S. Colored Troops. Battery B of the 2nd U.S. Colored Troops Light Artillery was formed at Fort Monroe in January 1864. Also in 1864 the Army of the James was formed at the fort. The Army included several regiments of U.S. Colored Troops (DOI 2008). The "contraband" population became so large that a hospital was built for their treatment. Harriet Tubman was appointed matron, or chief nurse, of the hospital and she served in that position from March to July 1865 (Quarstein and Mroczkowski 2000; DOI 2008). By the end of the war, over 10,000 people had sought refuge at the fort (DOI 2008). Jefferson Davis, president of

[4] The Old Point Comfort Lighthouse is a contributing element in the Fort Monroe NHL, but it is not managed by Fort Monroe. The Old Point Comfort Lighthouse is also individually listed on the NRHP.

the Confederacy, was a prisoner at the fort from 19 May 1865 to May 1867. He never faced trial (Quarstein and Mroczkowski 2000).

The Civil War Period marks the beginning of the HARAM's National Period; Building 27 is the one remaining building constructed during this period, as much of the construction during the Civil War was designed for temporary use and was later demolished (McDaid and Schenian 2003).

Reconstruction and Growth Period (1865 to 1917). During Reconstruction Fort Monroe was relatively peaceful; most of the existing historic buildings were constructed during this time. The Artillery School was re-established in November 1867, but closed again during the Spanish-American War. The Endicott Batteries were constructed during this period. In March 1885, President Cleveland convened the Endicott Board of Fortifications, headed by then-Secretary of War William Endicott, to evaluate the seacoast defenses of the U.S., resulting in a concept of separate-but-related, concrete and earth gun emplacements that would house 10- and 12-inch 'disappearing' guns. At Fort Monroe, batteries DeRussy, Parrott, and others were built on this model and were operational from the early 1890s until the end of WWII (DOI 2008). During the late-19th century, the U.S. became involved in overseas interests, which led to the Spanish-American War. Fort Monroe became a point of embarkation for troops going off to war, but the most influential event during reconstruction was the reorganization of the U.S. Army.

Most of the construction at Fort Monroe during this period is associated with the reorganization of the Army educational system during the early-20th century (McDaid and Schenian 2003). The Coast Artillery School was established at Fort Monroe in 1907; numerous buildings were constructed for classrooms, administrative buildings, and housing to support the new school. There are 106 extant buildings constructed during this period. The period of Reconstruction and Growth marks the beginning of the HARAM's National Period. Buildings include the Sub-Tuilerie, Building 16 and Building 3, built in 1875 and remodeled in 1908 and 1910; the Old Main Barracks (Building 5) and the Ingalls Road Corridor, including the Fire Station (Building 24), built in 1881; Post Headquarters (Building 77) built in 1894; the Old Bachelor's Quarters (Buildings 80 and 81) built in 1897; and the Hospital Building (Building 82) and Post Office (Building 83) built in 1898 (DOI 2008). The original Chamberlin was built between 1890 and 1896. This structure burned and was replaced in 1928. In addition, in 1909 the Commanding General's Quarters were built on Fenwick Road, and St. Mary Star of the Sea Church was rebuilt in 1903. In 1907, the U.S. Navy Atlantic Fleet, known as the 'Great White Fleet,' consisting of 16 battleships was part of the Jamestown Exposition, held in Hampton Roads, just off Fort Monroe. The fleet was then sent by President Theodore Roosevelt to the Pacific.

World War I to World War II (1917 to 1945). The U.S. entered WWI in 1917. Fort Monroe continued as the Coast Artillery School and became a training center as part of the larger trend associated with the development of professional education for soldiers. After the war, the Army was reduced in size. During the Great Depression, military construction was funded through the Public Works Administration and the Works Progress Administration. There are 26 extant buildings that were constructed during this period. These include the

Motor Pool (Building 57); the Ordnance Machine Shop (Building 59); and the Submarine Mine Depot (Building 28), built between 1934 and 1938. With the entry of the U.S. into WWII, Fort Monroe became a mobilization post and the sector headquarters for the Chesapeake Bay. In 1942 Fort Monroe became the headquarters for the Chesapeake Bay Coastal Defense Sector, controlling shipping in Hampton Roads during WWII (DOI 2008). The first 12 years of this period are considered HARAM's National Period, with the remaining 15 years considered HARAM's Modern Period.

The New Dominion Period (1945 to Present). After WWII, the face of warfare changed with the rise of strategic bombing. Traditional coastal artillery defenses could not adequately defend against this form of attack, so the Coast Artillery School was moved from Fort Monroe in 1946 and deactivated in 1950. From the end of WWII to the present, Fort Monroe has been host to the general headquarters for several major commands of the U.S. Army (McDaid and Schenian 2003). In 1951 the Casemate Museum opened to the public in Casemate 20. In 1953 the Wherry Housing complex Monroe apartments were constructed under the nationwide Wherry Military Family Housing program. The complex originally contained 53 buildings and 206 housing units. In 1955 the Fort became the Headquarters for the Continental Army Command. The Fort was designated an NHL on 9 May 1961 and was added to the NRHP on 15 October 1966. In 1973, Fort Monroe became home to TRADOC, which provides training and education of soldiers with operational doctrine.

Military History. The Military History of Fort Monroe has been described in the discussion of the Historic Context of Fort Monroe, above.

4.9.1.2 Description of Cultural Resources

Prehistoric and Historic Archaeological Resources. Archaeological surveys were completed for all accessible properties. Areas covered by asphalt, for example, parking lots, were not accessible and therefore not tested. One numbered archaeological site, 44HT27, was identified and divided into 21 distinct loci. Ten loci, and parts of an eleventh, are eligible for listing on the NRHP. Five loci, and part of two others, are not eligible for listing, and four loci, and part of a fifth require further investigation to determine their NRHP eligibility (U.S. Army 2008b). Locus 11 was identified as NRHP-eligible and a portion of Locus 20 was identified as potentially eligible for listing on the NRHP. Table 4.9-2 identifies the individual loci and their NRHP status to date.

Table 4.9-2 Site 44HT27 Evaluation of Identified Loci

NRHP-Eligible	Ineligible for NRHP	Further Investigation Required
Loci: 3-6, 9-12, 16, 19, 18A, and 18B	Loci: 1, 2, 8, 14, 15, 18C and part of 20	Loci: 7, 13, 17, 21, and part of 20

Historic Buildings and Structures. Fort Monroe is a NHL and is listed on the NRHP. The boundaries of the Fort Monroe NHL and of the Fort Monroe Historic District are the same. From the point where Mugler Bridge enters Fort Monroe, the perimeter follows the

installation's western shoreline south to the Navy Yard and Chamberlin parking lot, continues along the Hampton Roads harbor shoreline eastward to near Battery Parrott, then turns north along the Chesapeake Bay shoreline and follows the seawall to its end near Dog Beach. From there, it continues west, crossing to Mill Creek, then follows the Mill Creek shoreline to the point where the Mercury Bridge enters Fort Monroe, continues along the western shoreline, and connects with the starting point (Figure 4.9-1).

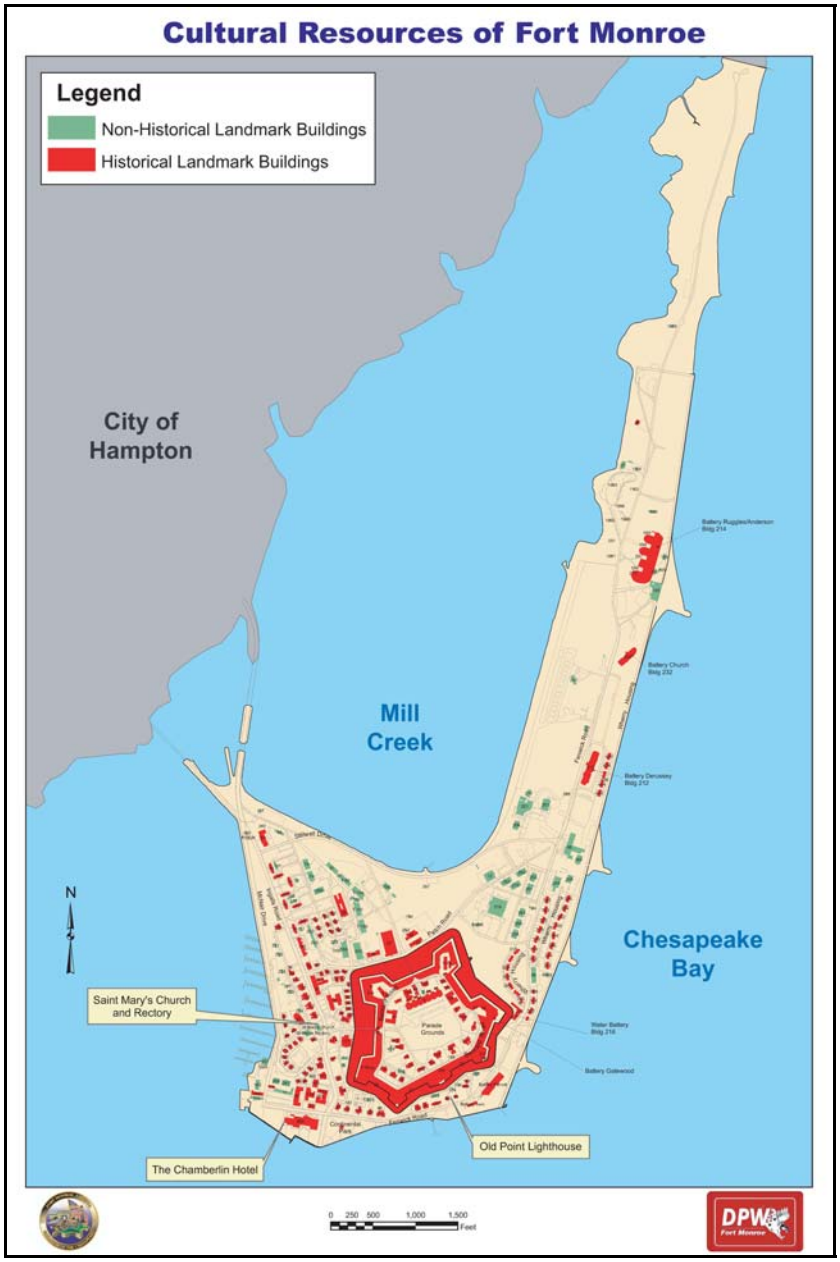


Figure 4.9-1 Cultural Resources of Fort Monroe, Virginia

Part of the Army mitigation responsibilities of the Fort Monroe PA will be to "revise the Fort Monroe NHL District nomination to more clearly define the boundaries and more accurately identify those buildings, structures, objects, archaeological sites, historic viewsheds, and landscape features that cont55ribute. . .." to the NHL District (U.S. Army 2009). The PA also states that the northern boundary of the NHL currently ends at the seawall, and that it has been proposed that the existing boundary be extended to include the full property owned by the Army. As a result, for the BRAC undertaking, the Army will treat the area extending north of the seawall to the northern property line that abuts Buckroe as contributing to the NHL District (U.S. Army 2009). The PA for the closure and disposal of Fort Monroe has been legally executed by the signing of authorized representatives of the U.S. Army, the Virginia SHPO, the ACHP, the Commonwealth of Virginia, the FMFADA, and the NPS. It identifies the following management zones and individual properties:

- Zone A: the West Peninsula;
- Zone B: the East Peninsula;
- Zone C: the North Gate/Stilwell Drive;
- Zone D: McNair, Ingalls, Fenwick Corridors;
- Zone E: Stone Fort and Moat;
- Endicott Batteries; and
- Individually eligible historic properties, which are the casemate stone fortification including the moat and the Water Battery; Quarters 1, Quarters 17, and the Chapel of the Centurion.

The PA outlines treatment standards for each of the management zones while also affirming that the zones are to be treated comprehensively as part of Fort Monroe.

There are 189 contributing elements identified in the Fort Monroe NHL District, listed in Appendix D of the Fort Monroe PA. These are: 113 housing buildings, 60 administrative buildings, 2 supporting buildings, 1 stone fort (including 11 named or numbered segments), 3 structures, 9 landscape features, and 1 object.

The Chamberlin (Building 500), St. Mary's Church, the rectory, and the Old Point Comfort Lighthouse also are contributing elements within the Fort Monroe NHL and Historic District, but are not owned or managed by the Army. The Chamberlin is privately owned. St. Mary's Church and rectory are owned by the Catholic Diocese of Richmond. The Old Point Comfort Lighthouse is owned by the USCG. The Old Point Comfort National Bank building is privately owned and is a non-contributing element in the Fort Monroe NHL. The Navy owns the navigation laboratory (NavLab), a non-contributing building.

The buildings owned by non-Army entities are not included in the contributing element and non-contributing element counts, because Army and DoD tallies of quarters, historic buildings, and so forth only include Army-owned properties. As such it would be confusing to have different counts in the ICRMP than appear in the official tracking inventories, such as the Installation Status Report.

The buildings that were less than 50 years old at the time of the 1987 survey would not qualify as "contributing" within the Fort Monroe NHL District, which has 1818-1946 as its period of significance, as it is currently defined. However, these buildings were identified in the ICRMP as requiring evaluation as to their individual eligibility, their eligibility as contributing elements in a new district, or for possible re-evaluation of the period of significance of the Fort Monroe NHL.

The NHL District includes 31 Wherry Housing units which are subject to *Program Comment for Capehart and Wherry Era Army Family Housing and Associated Structures and Landscape Features (1949-1962)* (Federal *Register*/Vol. 67, No. 110/Friday, 7 June 2002, in U.S. Army 2008a).

Cemeteries. According to Colonel Robert Arthur, who wrote the first comprehensive history of Fort Monroe in 1930, a post cemetery was located north of the fort, which had been used for many years. Arthur writes that "In the years immediately following the war [Civil War], many of the bodies were removed to the Hampton National Cemetery, and the post cemetery was abandoned. . . " (Arthur 1930). A 'Freedman's Cemetery' could also be located on the property. Stipulation H(5) of the Fort Monroe PA (*Other Measures)* includes additional archaeological testing within the boundary of Fort Monroe to try to identify any remnant of a 'Freedman's Cemetery'. This mitigation effort, proposed by the Army and agreed to by the consulting parties, will search for remnants of a possible Contraband cemetery on the post. In addition, Fort Monroe has a pet cemetery that is located along a portion of the terreplein near the Casement Museum. The terreplein is a landscape feature of the Stone Fort complex, and is a contributing element to the Fort Monroe NHL District. The earliest known stone dates to 1936; however the pet cemetery most likely was used as early as the 1920s. Pet burial was discontinued by Army regulation in 1988.

Disposition of Archaeological Artifacts and Associated Documentation. The archaeological surveys and evaluations of Fort Monroe have created artifact collections and associated documentation. The Fort Monroe collection includes not only the materials recovered from the systematic, archaeological identification survey and the evaluation testing of four loci. It also includes materials collected as "spot finds" associated with construction projects.

The Casemate Museum. The Casemate Museum is one of 60 museums in the Army Museum System and is managed by the U.S. Army Center for Military History (CMH). The museum holds approximately 8,000 historic objects and 4,000 archival items (DOI 2008). In FY 2007 there were 32,835 visitors to the museum. Provided that the FMA establishes an acceptable museum operation, the Army shall consider, under the guidance of the CMH, the on-site loan of all or part of the Casemate Museum collection artifacts pertinent

to Fort Monroe's historic significance. Further details are provided in the PA (see Appendix F).

Paleontological Remains. There are no known paleontological localities at Fort Monroe.

4.9.1.3 Status of Cultural Resource Inventories and Section 106 Consultations

This section provides a brief discussion of the prehistoric and historic cultural resources investigations, including management plans, architectural surveys, archaeological surveys, and archaeological excavations conducted at Fort Monroe to date.

The HABS documentation, *The Architectural Heritage of Fort Monroe, Inventory Documentation of Historic Structures undertaken by the Historic American Buildings Survey,* was completed in 1987 (DOI 1987). In 1988, Mariani & Associates Architects prepared the *Department of the Army Study/Survey of Historically Significant Army Family Housing Quarters: Installation Report Fort Monroe, Hampton, Virginia* (McDaid and Schenian 2003).

A Phase I archaeological survey of Fort Monroe was completed in 1999 (Balicki, et al. 1999, McDaid and Schenian 2003).

An ICRMP was completed for Fort Monroe in 2003 (McDaid and Schenian 2003), and continues to be updated. A HARAM Plan for the Fort was completed in 2001. The appendices of the ICRMP contain standard operating procedures for the most common cultural resource management situations likely to occur at Fort Monroe. The HARAM contains guidance relating to many of the common repair and maintenance issues on Fort Monroe's historic buildings.

According to the ICRMP (McDaid and Schenian 2003), a number of archaeological investigations have been completed at Fort Monroe. Archaeological reports include: *Phase II Archaeological Evaluations of Loci 6, 8, 16, and 19, 44HT27 Fort Monroe Virginia (*Thunderbird 2000); *Phase II Archaeological Investigations at Loci 1, 15, 18, and 20 and Phase III Data Recovery at Locus 16, 44HT27, Fort Monroe, Virginia,* (Thunderbird 2003); *Phase II Archaeological Investigations of Loci 3and 9, Fort Monroe, Virginia (*Pan American 2005); and *Phase I Archaeological Investigations at the Parade Ground and Continental Park, Fort Monroe, Virginia* (Pan American 2004). The archaeological investigations include Phase II testing at Loci 6, 8, 16, and 19 of Fort Monroe (Archaeological Site 44HT27) (1999–2000); Phase III mitigation monitoring and excavation in conjunction with utility line trenching associated with the Quarters 119 renovation project (2000–2001); Phase II testing at Loci 1, 15, and 18 in 2001; and excavation associated with the renovation of the YMCA (Building 171) in 2001, which resulted in the discovery of a deeply buried archaeological site, designated Locus 20. This site, containing extensive archaeological deposits associated with the first Hygeia Hotel, was recommended as potentially eligible for the NRHP. Phase II testing conducted in conjunction with the renovation work resulted in the discovery of a prehistoric component beneath the Hygeia artifact remains. The Phase II testing of Locus 15 uncovered an intact wall segment believed to be a remnant of the 18th-century Fort George. A ground-penetrating radar

survey was performed in the vicinity of the wall segment. The survey confirmed that the wall segment continues both vertically and horizontally beyond the remains observed in the excavations. Locus 15 has been considered ineligible for the NRHP. The area south and east of Locus 15, which shows that wall remains continuing beyond the locus, have been given their own locus designation, Locus 21. Locus 21 is considered potentially NRHP-eligible. Loci 3 and 9 have been determined NRHP-eligible. Determinations of NRHP-eligibility have not been made for loci 7, 13, 17, 21, and a small part of loci 20.

In addition to these regulation-driven documents, a history of Fort Monroe, *Defender of the Chesapeake: The Story of Fort Monroe*, was completed (Weinert and Arthur 1989, McDaid and Schenian 2003). That history was based on the *History of Fort Monroe* by Robert Arthur. *Fortress America: The Corps of Engineers, Hampton Roads, and United States Coastal Defense* is a monograph by David Clary that describes the fortification of Hampton Roads (Clary 1990, McDaid and Schenian 2003). The role Fort Monroe played during the Civil War has been documented also, including in a book written by curators of the Casemate Museum and the Virginia War Museum (McDaid and Schenian 2003).

A reconnaissance study was prepared by the NPS in anticipation of the BRAC action (DOI 2008). The study included a detailed history of the fort. The purpose of the study was to analyze and report findings of the likelihood of Fort Monroe's resources meeting Special Resource Study criteria for designation as a unit of the NPS. The study concluded that the fort's resources are likely to meet the criteria for national significance and suitability as a potential unit of the National Park system, should a Special Resource Study be authorized by congress. However, the study also concluded that because of cost and other factors, it is unlikely that a Special Resource Study would find the entire resource base feasible for unit designation, and that even the fort itself would be unlikely to be found feasible without a strong and financially sustainable partner to contribute to the costs of managing, maintaining, and operating the historic structures and landscapes. The study recommended that congress defer authorization of a Special Resource Study until the NPS reviews the Reuse Plan to determine if any potential role for the NPS is likely to meet the feasibility criterion (DOI 2008).

Section 106 Consultation. The Section 106 consultation has been completed resulting in the PA that was signed in 2009. The signatories are the Army, the Virginia SHPO, the ACHP, the Commonwealth of Virginia, the FMFADA, and NPS. The PA is presented in Appendix F of this EIS and specifics regarding mitigation are detailed in Section 4.15. Addressed in the PA are effects to the Historic District and individual significant historic buildings and objects, cemeteries, and archaeological sites. The Army will continue to execute Section 106 and PA responsibilities up to base closure. The Army will provide historic preservation covenants, easements, or other appropriate cultural resource protections on non-revisionary land. The Army was also obligated to complete a viewshed analysis to identify significant viewsheds both from and toward the NHL District; complete a Cultural Landscape Study; revise the NHL nomination form to more clearly define the NHL boundaries; complete draft NRHP nominations for certain buildings; consider the museum collections; and conduct archaeological testing to search for a former 'Freedman's Cemetery'. Also, prior to closure, the FMA will develop a Historic

Preservation Manual and Design Standards for activities that will occur on the reversionary and non-reversionary land at Fort Monroe. Additional measures are required prior to closure and are listed in the PA. Concurring parties to the PA are listed in Table 4.9-3.

Table 4.9-3 Signatories and Concurring Parties for the Programmatic Agreement

Signatory Parties	
Advisory Council on Historic Preservation	Virginia Department of Historic Resources
Commonwealth of Virginia (Governor)	Department of Army
Fort Monroe Federal Area Development Authority	National Park Service
Concurring Parties	
Absentee-Shawnee Tribe of Indians of Oklahoma	National Parks Conservation Association
American Legion Post 48	National Trust for Historic Preservation
APVA Preservation Virginia	Norfolk Historical Society
Buckroe Civic Association	Norfolk Preservation Alliance
Catawba Indian Nation	Old Point National Bank
Citizens for a Fort Monroe National Park	Phoebus Civic Association
City of Hampton	Phoebus Improvement League
Civil War Preservation Trust	Shawnee Tribe
Coast Defense Study Group	The Archaeological Society of Virginia
Diocese of Richmond	The Casemate Museum Foundation
Hampton University	The Contraband Historical Society
Independent Citizen Association	United Daughters of the Confederacy
National Historic Landmark Stewards Association	Virginia Council on Indians
	Virginia Department of Environmental Quality

Apart from the PA, other agreement documents relevant to cultural resources at Fort Monroe are the Chamberlin Lease PA; the Queen Anne Duplex Demolition MOA; and the Flood Control Improvement MOA. These PAs are specific to buildings within Fort Monroe, e.g., the Chamberlin. The *Program Comment for Capehart and Wherry Era Army Family Housing and Associated Structures and Landscape Features (1949-1962)* applies to the housing units within Fort Monroe's Wherry Quarter.

4.9.1.4 Native American Resources

Several Native American archaeological sites have been identified on Fort Monroe. However, no properties of traditional religious and cultural importance or Native American sacred places are known to exist on Fort Monroe.

There are no federally recognized tribes in the Commonwealth of Virginia. However, there are eight state-recognized Native American groups in Virginia. Six are associated with the

Coastal Plain, in which Fort Monroe is located, including the Rappahannock Tribe; the Mattaponi Indian Reservation; the Chickahominy Tribe; the Upper Mattaponi Tribe; the Eastern Chickahominy Tribe; and the Pamunkey Tribe. To facilitate outreach to Native American Groups, consultation was initiated through Virginia Council on Indians (VCI) for both state-recognized Native American groups in Virginia and other potentially interested tribes. The VCI is an advisory board to the Governor and the General Assembly of Virginia. These groups were invited to participate as concurring parties to the PA. Native American groups that expressed interest in participating included: the Catawba Indian Nation, the Shawnee Tribe, and the Absentee-Shawnee Tribe of Indians of Oklahoma. The last three groups were added to the PA as concurring parties to the document.

4.9.2 Consequences

4.9.2.1 Early Transfer Disposal Alternative

***Direct*.** Long-term minor to moderate beneficial and adverse effects to cultural resources are expected. The finalized PA addresses effects to the Historic District and individual significant historic buildings and objects, cemeteries, and archaeological sites. Adverse effects would be avoided by the continued maintenance and protection of historic resources under the PA, as well as information obtained from additional studies. The Army will complete a viewshed analysis to identify significant viewsheds both from and toward the NHL District, complete a Cultural Landscape Study, revise the NHL nomination form to more clearly define the NHL boundaries, complete draft NRHP nominations for certain buildings, consider the museum collections, and conduct archaeological testing to search for a possible 'Freedman's Cemetery'. Also, prior to closure, the FMA will develop a Historic Preservation Manual and Design Standards for activities that will occur on the reversionary and non-reversionary land at Fort Monroe. Additional measures are required prior to closure and are listed in the PA.

Adverse effects include the potential for as yet unidentified archaeological resources to be disturbed. Also, infill construction could adversely affect historic viewsheds and the feel and character of the historic buildings and the Historic District. However, these effects should be minor given the use of design standards and viewshed analysis that will ensure aesthetic compatibility with existing historic structures.

In the long term, increases in soil disturbance could be caused by new buildings and road construction or trench excavation for underground pipes, cable lines, and similar infrastructure projects. These disturbances may increase the likelihood of disturbance of as yet unknown cultural resources or cemeteries. Vandalism can also occur when the location of an archaeological site or cemetery becomes known or otherwise attracts new attention. To reduce potential effects to cultural resources, site surveys of potential archaeological resources at Fort Monroe have been completed, and Section 106 consultations concerning the disposal of eligible properties will be completed prior to transfer. Negotiated terms of transfer or conveyance will result in requirements for the new owners to maintain the status quo of archaeological sites and will impose a requirement for consultation with the Virginia SHPO prior to any actions affecting these resources. The

PA addresses adverse effects and mitigation. An additional discussion of historic building encumbrances is found in Section 3.2.5.

***Indirect*.** No indirect effects are expected.

4.9.2.2 Traditional Disposal Alternative

***Direct*.** Long-term minor to moderate beneficial and adverse effects to cultural resources are expected. Effects would be similar to those described under the early transfer disposal alternative; but the changes in effects would occur further in the future. In addition, the conditions and terms of transfer would be similar to those discussed above for the early transfer disposal alternative.

***Indirect*.** No indirect effects are expected.

4.9.2.3 Caretaker Status Alternative

Direct. Minor to moderate adverse effects to cultural resources are expected. Under this alternative, access to Fort Monroe would be very limited, and maintenance levels would be low. According to the PA, the Army would "develop a plan to mothball buildings and structures that have been or are to remain vacant for twelve (12) months or longer, or if there is no planned use for them, according to the guidance found in the *Preservation Brief 31: Mothballing Historic Buildings, the Historic Fortification Preservation Handbook* (DOI 2008) (U.S. Army 2009). Historic buildings that are eligible for or listed on the NRHP might be subject to vandalism or deterioration because of limited presence of maintenance personnel.

***Indirect*.** No indirect effects are expected.

4.9.2.4 No Action Alternative

No direct or indirect effects would be expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure, including implementation of ICRMP measures. Thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.9.2.5 Intensity-Based Probable Use Scenario

Lower Bracket, Direct. Moderate beneficial effects would be expected. Under this alternative, building intensity would be limited to current baseline conditions, with the addition of a greater emphasis on tourism. There would be no change in open space or increase in impervious surface, and the Historic District would be maintained and enhanced to attract tourists.

Beneficial effects could include compatible upgrades and reuse and maintenance of historic structures, in addition to the completion of studies under the PA.

The Inner Fort, the Historic Village and Entry Gate, the North Gate historic buildings, and the batteries would be retained and reused. Wherry Housing buildings would also be

retained. The PA requires that any treatment options, maintenance, repair, or alteration follow the design standards which are based on NPS standards and guidelines for historic preservation.

***Lower Bracket, Indirect*.** No indirect effects are expected.

Middle Bracket. Direct. Moderate beneficial and minor adverse effects could occur. By adhering to the PA beneficial effects are highly likely to occur. Under this alternative there would be infill and expanded development, although not as dense as under the Upper Bracket scenario. Approximately 15 acres of existing green space would be developed, as well as redevelopment on another 70 acres, to include up to 1,300 new residential units and non-residential development of up to 100,000 SF. Construction would be mainly for residences and lodging. Beneficial effects could include compatible upgrades, reuse, and maintenance of historic structures. All restoration would be done according to the design standards.

Minor adverse effects would include the potential for disturbance of unknown resources during new construction, as well as adverse effects to known resources from vandalism. Limited building demolition of non-historic structures and infill construction could result in minor adverse impacts to the look and feel of viewsheds, depending on location and design of new structures. However, these effects should be minor given the use of design standards and viewshed analysis that will ensure aesthetic compatibility with existing historic structures. Depending on the nature of redevelopment, unknown archaeological sites or cemeteries could be disturbed through soil disturbance or vandalism. Soil disturbance from construction of new facilities, roads, and infrastructure expansion could occur. Vandalism can occur when the location of an archaeological site or cemetery becomes known or otherwise attracts new attention.

Negotiated terms of transfer or conveyance and adherence to the PA will result in requirements for the new owners to maintain the status quo of archaeological sites and historic structures and objects and will impose a requirement for consultation with the Virginia SHPO prior to any actions affecting these resources. Such actions will reduce potential adverse effects associated with increased development at Fort Monroe. The PA discussed above would be in force.

The types of development expected under this Middle Bracket scenario are further discussed below.

Inner Fort: Full occupancy of buildings for uses such as a maritime research center or oceanographic institute, a college campus, a specialized research center, conference center, and/or national headquarters for a nonprofit organization is proposed. Maintenance of historic buildings, if not in keeping with the Secretary of the Interior's standards, could have an adverse effect. Intentional demolition of non-historic structures is possible, depending on the actions of the future owners.

Historic Village and Entry Gate: Selective infill development is proposed, to be constrained by height requirements, and marina expansion, with new slips and new

facilities. Infill development could alter the historic feel and viewshed of the historic structures, although design standards will ensure aesthetic compatibility with existing structures. As-yet-unidentified archaeological site and cemeteries could be disturbed through soil disturbance caused by new construction.

North Gate: New workplace and residential buildings would be constructed among the contributing historic structures. New construction could alter the historic feel and viewshed of the historic structures, although design standards will ensure aesthetic compatibility with existing structures. Contributing properties may be demolished. As-yet-unidentified archaeological site and cemeteries could be disturbed through soil disturbance caused by new construction.

Wherry Quarter: Wherry Housing would be refurbished and new residences would be constructed to a limited degree. Should the Wherry Housing be refurbished according to the Secretary of the Interior's standards, moderately beneficial impacts would be expected. However, to mitigate adverse effects to Capehart and Wherry Era housing, the Army completed Section 106 compliance under the NHPA for Capehart and Wherry Era Housing through the *Program Comment for Capehart and Wherry Era Army Family Housing and Associated Structures and Landscape Features (1949-62)*, approved on 31 May 2002 by the ACHP. In addition, the PA addressed Wherry housing at Fort Monroe, stating in part that, "All restoration, preservation, rehabilitation, or reconstruction (if appropriate due to the loss of a historic property) shall be done according to the design standards." Design standards are part of the PA.

Parks and Recreation Areas: A northern connection between Fort Monroe and Buckroe areas may be constructed; and beach nourishment along the Chesapeake Bay shoreline may occur. Following the PA, such construction would be beneficial to the Historic District by restoring the shoreline and enhancing the feel of the fort.

***Middle Bracket, Indirect*.** No indirect effects are expected.

***Upper Bracket, Direct*.** Moderate beneficial and moderate adverse effects could occur similar to those discussed above. Under this alternative there would be additional infill and expanded development. Approximately 25 acres of open green space would be developed along with an additional 75 acres of redevelopment, to include up to 1,500 new residential units, and non-residential development of up to 200,000 SF. Beneficial effects could include compatible upgrades, reuse, and maintenance of historic structures. Limited building demolition of non-historic structures and infill construction could result in minor adverse impacts to the look and feel of viewsheds depending on location and design of new structures. However, these effects should be minor given the use of design standards and viewshed analysis that will ensure aesthetic compatibility with existing historic structures. Also, depending on the nature of redevelopment, unknown archaeological sites or cemeteries could be disturbed through soil disturbance or vandalism. Soil disturbance from construction of new facilities, roads, and infrastructure expansion could occur. Vandalism can occur when the location of an archaeological site or cemetery becomes known or otherwise attracts new attention.

Negotiated terms of transfer or conveyance and adherence to the PA will result in requirements for the new owners to maintain the status quo of archaeological sites and historic structures and objects and will impose a requirement for consultation with the Virginia SHPO prior to any actions affecting these resources. The comprehensive PA addresses adverse effects and also requires a number of comprehensive documentation and mitigative actions, as described above. Such actions will reduce potential adverse effects associated with increased development at Fort Monroe.

Upper Bracket Intensity, Indirect. No indirect effects are expected.

4.10 SOCIOECONOMICS

4.10.1 Affected Environment

Fort Monroe is located in Hampton, Virginia, an independent city at the southeast end of the Virginia Peninsula. The geographic ROI for socioeconomic affected environment and impact analysis consists of the Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (MSA). This was identified by DoD as the ROI in which potential socioeconomic impacts related to 2005 BRAC actions at Fort Monroe would most likely occur (U.S. DoD 2005). The MSA includes the North Carolina county of Currituck and the Virginia Counties of Gloucester, Isle of Wight, James City, Mathews, Surry, and York. It also includes the independent Virginia cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. Within this ROI the City of Hampton was defined as a sub-ROI to show where the greatest concentration of socioeconomic impacts related to 2005 BRAC actions at Fort Monroe would occur.

4.10.1.1 Economic Development

In 2005, the civilian labor force within the ROI was about 796,000, with an average annual unemployment rate of 3.9 percent (U.S. Bureau of Labor Statistics [BLS] 2008). In the City of Hampton, the civilian labor force was approximately 67,400 in 2005, with an average annual unemployment rate of 4.4 percent, slightly greater than the overall ROI and the state.

According to the BLS the unemployment rate was only slightly higher than the statewide rate of 3.5 percent, and the state, ROI, and sub-ROI unemployment rates were less than the national rate of 5.1 percent (BLS 2008). The 2005 labor force in the ROI was 10.3 percent larger than in 2000, and was higher than the statewide average over the same five-year period (9.4 percent) and the City of Hampton average during the same time period (5.4 percent) (BLS 2008). The per capita personal income for the ROI in 2005 was $33,259 – lower than the statewide per capita personal income of $37,901. The City of Hampton had a per capita personal income lower than the overall ROI in 2005, $29,546. The average annual growth rate of per capita personal income from 1995 to 2005 for the ROI, sub-ROI, and the state were similar, at 4.8 percent, 4.7 percent, and 4.7 percent respectively (U.S. Bureau of Economic Analysis [BEA] 2005a). These data are shown in Table 4.10-1.

Table 4.10-1 Fort Monroe ROI Labor Force, Unemployment, and Personal Income

ROI and State	Labor Force			Per Capita Personal Income		
	2005	Percent Change 2000 - 2005	2005 Unemployment Rate	2005	National Rank	1995-2005 Average Annual Growth Rate (Percent)
Virginia Beach-Norfolk-Newport News MSA	796,145	10.3	3.9	$33,259	105	4.8
Hampton	67,403	5.4	4.4	$29,546	N/A	4.7
Virginia Total	3,922,735	9.4	3.5	$37,901	7	4.7
Data Sources: BLS, Local Area Unemployment Statistics BEA, BEARFACTS, Regional Economic Accounts (1995-2005 data)						

Within the ROI in 2005, the top three industries were retail trade, the military, and state and local government, each providing more than 10 percent of employment to the region (BEA 2005b). With the exception of the military, this is reflective of state industry as a whole. Please see the top 10 employment industry sectors for the ROI and state in Table 4.10-2.

Table 4.10-2 Employment by Industry (2005)

Industry	ROI		Virginia	
	Employment	Percentage	Employment	Percentage
Retail Trade	111,243	10.9	510,774	10.7
Military	108,323	10.6	163,499	3.4
State and Local Government	107,425	10.5	515,728	10.8
Health Care and Social Assistance	79,625	7.8	373,277	7.9
Professional and Technical Services	59,743	5.8	448,817	9.4
Manufacturing	58,395	5.7	305,801	6.4
Administrative and Waste Services	58,037	5.7	262,469	5.5
Other Services, Except Public Administration	48,037	4.7	276,631	5.8
Federal, Civilian Government and Government Enterprises	41,926	4.1	169,218	3.6
Real Estate and Rental and Leasing	41,926	4.1	191,368	4.0
Total Employment	**1,023,157**	**100**	**4,754,318**	**100**
Data Source: BEA, Regional Economic Accounts, Total full- and part-time employment by industry. Table CA25N. <http://www.bea.gov/regional/reis/default.cfm?catable=CA25N&series=NAICS>				

Government and government enterprise employment (including federal, civilian, military, state government, and local government) made up approximately 25 percent of the employment in the ROI in 2005 (BEA 2005b). Military employment alone made up 10.6 percent of total employment in the ROI, as Langley AFB is also located in the City of Hampton (BEA 2005b).

Also within the ROI are many other military facilities, including NAS Oceana, Naval Weapons Station Yorktown, Norfolk Naval Shipyard, Saint Julian Creek Naval Depot Annex, Naval Amphibious Base Little Creek, Fleet Training Center Dam Neck, Camp Peary, Fort Story, and Fort Eustis. Table 4.10-3 lists major non-government employers within the ROI.

Table 4.10-3 Major Nongovernment Employers in the ROI

Employer's Name	Product/Services	Estimated Employment
Manufacturing		
Northrop Grumman Newport News	Ship building and repair	10,000 – 19,999
Ford Motor Company, Inc.	Trucks	2,500 – 4,999
Gwaltney of Smithfield, Ltd.	Meat processing and packaging	1,500 – 2,499
International Paper Co.	Lumber and particleboard	1,500 – 2,499
Smithfield Foods Inc.	Processed meat products	1,500 – 2,499
Stihl, Inc.	Power tools	1,000 – 1,499
Canon VA, Inc.	Copiers and laser printers	600 – 999
Earl Industries LLC	Ship repair	600 – 999
Nonmanufacturing		
Lillian Vernon Corporation	Fulfillment center	2,500 – 4,999
Old Dominion University	Higher education	2,500 – 4,999
Riverside Regional Medical Center	Health care	2,500 – 4,999
Bank of America	Financial services	1,500 – 2,499
Bon Secours	Health services	1,500 – 2,499
Busch Gardens	Amusement park	1,500 – 2,499
The College of William & Mary	Higher education	1,500 – 2,499
APAC Services (for United Parcel Service)	Teleservices	1,000 – 1,499
QVC, Inc.	Shopping network distribution center	1,000 – 1,499
Data source: VA Beach-Norfolk-Newport News MSA, Virginia Community Profile		

The largest non-government employer in the ROI is Northrop Grumman Newport News Shipbuilding, with employment estimated to be between 10,000 and 19,000 workers (VA Beach-Norfolk-Newport News MSA). Other large employers are Ford Motor Company (closed in 2007), Riverside Regional Medical Center, Lillian Vernon Corporation, and additional companies listed in Table 4.10-3.

Fort Monroe's Contributions to the Regional Economy. Table 4.10-4 portrays the annual expenditures of Fort Monroe with respect to payroll and other expenditures that typically flow directly into the local economy. The military and civilian payrolls for FY 2005 were almost $204.5 million, with an additional $103 million expended for travel/transportation, utilities, contracts, training, construction, maintenance, supplies, equipment, and various other expenditures. In total, Fort Monroe expenditures contribute approximately $307.7 million to the local and regional economy.

Table 4.10-4 Major Expenditures, Fort Monroe FY 2005

Expenditure	Dollars
Military Payroll	$84,371,764
Civilian Payroll (APF/NAF)	$120,115,064
Total Payroll	**$204,486,828**
Travel (TDY)/Transportation	$6,110,136
Utilities	$1,999,061
Contracts, Intra-Army Purchases, Training	$82,336,618
Facility Construction/Maintenance	$4,774,291
Supplies and Equipment	$7,538,218
NAF Capital Expenditures/Minor Construction	$134,528
NAF Purchases	$376,334
Subtotal Nonpayroll Expenditures	**$103,269,186**
Total Expenditures	**$307,756,014**

4.10.1.2 Regional Demographics

Regional Population. There were 1.58 million people living in the ROI in 2005 (U.S. Census 2005). This represents a 0.6 percent increase over the nearly 1.57 million living in the ROI in 2000, considerably less than the statewide population increase of 3.6 percent over the same period. Population projections for the ROI predict that the population will increase by 10 percent over the next 15 years, reaching 1.75 million by the year 2020 (Virginia Employment Commission 2004). The state is predicted to have about a 20 percent increase between 2005 and 2020 (U.S. Census Bureau 2008). Table 4.10-5 depicts the population distribution and trends within the ROI from 1990 to 2005. The population in the City of Hampton was 146,437 in 2000 and is estimated to grow 2.2 percent in the next decade to reach an estimated 149,600 people by 2010 (City of Hampton 2009 b,c), well below the rate estimated for Virginia.

Table 4.10-5 Population Growth in the Fort Monroe ROI

ROI and State	Population				Projected (from 2000)	
	1990	2000	2005	Percent Change 2000–2005	2010	2020
Virginia Beach-Norfolk-Newport News MSA	1,499,389	1,576,370	1,585,416	0.6	1,658,500	1,749,100
Hampton	133,793	146,437	146,672	0.16	149,599	N/A
Virginia	6,187,358	7,078,515	7,332,608	3.6	8,010,245	8,917,395
Data Sources: U.S. Census Bureau American FactFinder (U.S. Census 2005) Virginia Employment Commission U.S. Census Bureau State Interim Population Projections: 2004-2030 (U.S. Census 2008)						

In 2005, the ROI's population was approximately 63.7 percent White, 32.6 percent African-American, and 3.7 percent other races (U.S. Census 2005). This varies from the state ethnicity percentages, likely due to the ROI being centered around an urbanized, metropolitan area. The median age in the ROI was 35.4, slightly lower than the state's median age of 37.2 (U.S. Census 2005). Within the City of Hampton, the percentages of white and African-American populations are almost equal to each other (48.4 percent and 48.6 percent, respectively). This is likely due to the city being an urbanized area. The median age in the City of Hampton is very close to that of the entire ROI, at 36 years. Table 4.10-6 compares selected demographic characteristics across the ROI, sub-ROI, and Virginia.

Table 4.10-6 Selected Population Characteristics, Fort Monroe ROI

ROI and State	Median Age	Percent White	Percent African-American	Percent Other	Percent Urban	Percent Rural
Virginia Beach-Norfolk-Newport News MSA	35.4	63.7	32.6	3.7	N/A	N/A
Hampton	36.0	48.4	48.6	3.0	N/A	N/A
Virginia	37.2	73.2	20.0	6.8	72.3	27.7
Data Source: U.S. Census American FactFinder, 2005 American Community Survey						

Fort Monroe Population. As of 31 November 2005, a total of 897 persons were living on-post at Fort Monroe. This figure includes military personnel and family members living in the barracks, family quarters, and the Wherry Apartments.

***Income, Unemployment, and Poverty*.** As shown in Table 4.10-8, in 2005, the median household income in the ROI was $51,077 (U.S. Census 2005). This number is about $3,000 lower than the median household income statewide, but about $6,000 greater than the City of Hampton ($45,105). As shown in Table 4.10-1, the average annual unemployment rate in the ROI in 2005 was 3.9 percent, comparable to the statewide average of 3.5 percent for Virginia, although the sub-ROI unemployment rate of 4.4 percent was higher than both the larger ROI and the state (BLS 2008). The poverty rate in the ROI (10.4 percent) is slightly higher than statewide (9.9 percent), and both the state and the ROI have lower poverty rates than the nation (13.2 percent) (U.S. Census 2005).

4.10.1.3 Housing

Regional Housing. In 2005 there were more than 600,000 housing units in the ROI, and more than 58,000 housing units in the City of Hampton, according to the U.S. Census (2005). The owner-occupancy rate for the ROI (64.6 percent) is similar to the statewide rate (69.6 percent), but the vacancy rate for housing units in the ROI is lower than statewide (U.S. Census 2005). Within the City of Hampton, the owner-occupancy rate was lower than the greater ROI and the state, likely due to the more urbanized nature of the city. The vacancy rate of the sub-ROI was also lower than the ROI and the state.

The median value of the owner-occupied homes in the ROI is nearly $22,000 less than the state median value; for renter-occupied housing units, the median rent is about the same for both the ROI and the state (U.S. Census 2005). The median value of owner-occupied homes in the City of Hampton was almost $50,000 lower than the larger ROI, although the median rent was comparable. Selected housing characteristics, including the number of housing units, occupancy status, median value, median rent, and vacancy rate, are shown in Table 4.10-7.

Table 4.10-7 Selected Housing Characteristics, Fort Monroe ROI

ROI and State	Total Housing Units	Percent Owner Occupied(1)	Percent Renter Occupied	Percent Vacant	Median Value, Owner Occupied	Median Rent, Renter Occupied
Virginia Beach-Norfolk-Newport News MSA	666,379	64.6	35.4	7.3	190,600	802
Hampton	58,810	61.1	38.9	6.1	139,300	757
Virginia	3,174,708	69.6	30.3	8.9	212,300	812

Data Source: U.S. Census American FactFinder 2005 American Community Survey (U.S. Census 2005)

(1) The owner occupied and renter statistics are shown as a percentage of all occupied housing units within the given geography.

The larger percentage of renter-occupied housing units (compared to the state) could be attributed to the urbanized nature of the ROI and sub-ROI.

4.10.1.4 Personnel Housing

Fort Monroe has a total of 285 housing units on post. Of these, 117 are in the Wherry Apartments, and the remaining 168 units are scattered elsewhere on post.

4.10.1.5 Quality of Life

Education. There are no schools on the Fort Monroe installation grounds.

There are 15 public school districts within the ROI. School-age children of Fort Monroe employees attend schools in the Hampton City Schools District. In 2005, approximately 397 students from Fort Monroe families attended Hampton City Schools (includes dependants of uniformed military living on-post, uniformed military working on-post, and special and regular civilians working on-post).

The U.S. Department of Education's Federal Impact Aid program provides funding for a portion of the education costs of federally connected students, but schools must apply for this funding. In 2005, Hampton City Schools received about $521,000 in Impact Aid for Fort Monroe students.

There are also private and parochial schools within the ROI which are attended by Fort Monroe children, but they do not receive Federal Impact Aid.

Shops and Services. Fort Monroe has a PX open seven days a week. In addition to various recreational services, the installation has a variety of youth services, including a child development center, youth activities center, sports programs, school liaison services, and family child care. Fort Monroe also offers a continuing education system for active duty soldiers, DoD civilians, and adult family members (Fort Monroe Directorate of Family and Morale, Welfare and Recreation [DFMWR]).

Hampton is located in close proximity to the City of Newport News, which offers a large number of shopping opportunities and services to surrounding areas.

Law Enforcement. Law enforcement and security at Fort Monroe is provided through the Fort Monroe Provost Marshal Office. The Provost Marshal Office responds exclusively to law enforcement emergencies occurring on Fort Monroe, including the housing areas, and has a House Watch Program for residents who are on leave or temporary duty assignment (Fort Monroe Provost Marshal Office). The Military Police Investigations and Traffic Accident Investigations divisions of the Provost Marshal Office have one investigator on call and provide services including investigations, evidence custodianship, found property custodianship, surveillance operations, special event management, and finger printing for military purposes only (Fort Monroe Provost Marshal Office).

Fire Protection. There is a fire department located on Fort Monroe that responds to incidents and emergencies on installation grounds.

The base has Memoranda of Understanding in place with the cities of Hampton, Norfolk, and Newport News; Langley AFB; and the Yorktown Naval Weapons Station in the event there is a fire emergency that requires additional support.

Recreation. Fort Monroe offers an outdoor recreation program that was awarded the "Best Small Installation Outdoor Recreation Program" at the National Recreation and Parks Association Annual Conference (DFMWR 2008). It was also ranked as Number One Outdoor Recreation Facility in the North East Region by the Army Leisure Needs Survey (DFMWR 2008). The outdoor recreation site provides picnic areas, camping areas, and an RV park. Fort Monroe also has a marina available for active duty and retired military personnel and their families, reserve military personnel, National Guard members, foreign military, DoD and retired DoD personnel and their families, veterans with 100 percent service connected disabilities, and DoD contractors working at Fort Monroe (DFMWR 2008).

Fort Monroe also has indoor and outdoor swimming pools, a bowling center, community center, fitness center, tennis courts, baseball fields, and a beach (DFMWR). The nearby City of Hampton offers museums, a convention center, the Hampton Coliseum (a large music venue), and a theater, among other cultural and recreational venues. Recreational opportunities are also available at Newport News, Norfolk, and Virginia Beach.

Health/Medical. The Craven Army Health Clinic is located on Fort Monroe and is an outpatient, ambulatory care clinic (Fort Monroe Health Clinic). It is aligned with the McDonald Army Community Hospital at Fort Eustis. The clinic provides service to eligible enrolled beneficiaries of Fort Monroe and surrounding military communities. It does not have emergency room capabilities (Fort Monroe Health Clinic).

Within the Virginia section of the ROI, there are 21 hospitals with over 5,386 beds. The City of Hampton has two hospitals, the Hampton Veterans Administration Medical Center and Sentara Careplex Hospital. In the nearby City of Newport News, the 576-bed Riverside Medical Center offers services including a nuclear medicine unit, comprehensive heart program, cancer treatment center, neurosurgery, and pediatrics.

The Fort Monroe Dental Clinic provides dental care for all active-duty personnel. Patients that require specialized care are referred to Fort Eustis for dental care (Fort Monroe Dental Clinic).

4.10.1.6 Environmental Justice

On 11 February 1994, President Clinton issued E.O. 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The purpose of this E.O. is to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations or communities. Emanating from this order was the creation of an Interagency Federal Working Group on Environmental Justice, comprising the heads of 17 federal departments and agencies, including the Army. Each department or agency is to develop a strategy and implementation plan for addressing environmental justice.

It is the Army's policy to fully comply with E.O. 12898 by incorporating environmental justice concerns in decision-making processes supporting Army policies, programs, projects, and activities. In this regard, the Army ensures that it will identify, disclose, and respond to potential adverse social and environmental impacts on minority and/or low-income populations within the area affected by a proposed Army action.

The initial step in the environmental justice analysis process is the identification of minority populations and low-income populations that might be affected by implementation of the proposed action or alternatives. For environmental justice considerations, these populations are defined as individuals or groups of individuals who are subject to an actual or potential health, economic, or environmental threat arising from existing or proposed federal actions and policies. Low income, or the poverty threshold, is defined as the aggregate annual mean income for a family of four in 2005 correlating to $19,350 (U.S. Department of Health and Human Services).

Low-income and minority population data was compared for the ROI, sub-ROI, and the Commonwealth of Virginia. This comparative analysis is summarized in Table 4.10-8. Based on U.S. Census estimates, in 2005 the ROI had a minority population percentage slightly higher than the state's: 36.3 percent and 26.8 percent, respectively (U.S. Census 2005). The City of Hampton had a considerably larger minority population, 51.6 percent, although the census tracts that border Fort Monroe property have minority populations similar to the state and ROI percentages. The poverty rate in the ROI was 10.4 percent in 2005, slightly higher than the state level of 9.9 percent (U.S. Census 2005). The national poverty rate in 2005 was 13.2 percent, higher than in both the state and the ROI but similar to the poverty rate in the City of Hampton (U.S. Census 2005).

Table 4.10-8 Minority and Low-Income Populations, Fort Monroe ROI

ROI and State	Total Population (2005)	Percent Minority Population (2005)	Median Household Income (2005 $)	Persons Below Poverty (2005)	Percent Persons Below Poverty (2005)
Virginia Beach-Norfolk-Newport News MSA	1,585,416	36.3	$51,077	164,529	10.4
Hampton	146,437	51.6	$45,105	19,329	13.2
Virginia	7,332,608	26.8	$54,240	728,947	9.9
Data Source: U.S. Census FactFinder – 2005 American Community Survey					

4.10.1.7 Protection of Children

On 21 April 1997, President Clinton issued E.O. 13045, Protection of Children from Environmental Health Risks and Safety Risks. This E.O. recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from

environmental health risks and safety risks. These risks arise because children's bodily systems are not fully developed; because they eat, drink, and breathe more in proportion to their body weight; because their size and weight can diminish protection from standard safety features; and because their behavior patterns can make them more susceptible to accidents. Based on these factors, President Clinton directed each federal agency to make it a high priority to identify and assess environmental health risks and safety risks that might disproportionately affect children.

It is the Army's policy to fully comply with E.O. 13045 by incorporating these concerns in decision-making processes supporting Army policies, programs, projects, and activities. In this regard, the Army ensures that it will identify, disclose, and respond to potential adverse social and environmental impacts on children within the area affected by a proposed Army action.

Historically, children have been present at Fort Monroe as residents and visitors (e.g. living in family housing, using recreational facilities). The Army has taken precautions for their safety in a number of ways, including the use of fencing, limiting access to certain areas, and providing adult supervision.

4.10.1.8 Homeless, Special Concerns

Pursuant to the Base Closure Community Redevelopment and Homeless Assistance Act of 1994, property that is surplus to the federal government's needs is to be screened by means of an LRA's soliciting notices of interest from state and local government, representatives of the homeless, and other interested parties. An LRA's outreach efforts to potential users or recipients of the property include working with HUD and other federal agencies that sponsor public benefit transfers under the FPASA.

The FMFADA has worked with the City of Hampton and homeless providers to develop a HUD Homeless Assistance Submission. The two interested homeless providers agreed on a trust fund option, rather than receiving land or buildings on Fort Monroe property. One provider will receive $263,000 and the second will receive $428,000 (FMFADA 2008b).

4.10.2 Consequences

4.10.2.1 Early Transfer Disposal Alternative

Economic Development

Direct. Long-term moderate beneficial and short-term minor adverse effects would be expected (see Section 4.10.2.5, Intensity-Based Probable Use Scenario, for further discussion of modeling results). The early transfer of Fort Monroe would enable immediate initiation of redevelopment activities, and therefore new job creation, increased local sales volume, possible economic diversification, and expansion of the tax base in the local and regional economies. Ongoing remediation activities would also generate additional employment, expenditures, and economic diversification, with similarly positive impacts on the local (sub-ROI) economy. Deed restrictions requiring continued remediation activities at the installation properties could preclude some uses of certain parcels, but this would

not impede the potential for economic development elsewhere on the property. These effects would not affect the ROI equally, but would affect areas within the sub-ROI at a higher intensity than areas within the larger ROI. These effects would also take place sooner than under traditional disposal.

The sub-ROI would experience minor adverse effects within the immediate short-term following transfer. Prior to redevelopment, and while redevelopment is ramping up, there will be initial direct loss of jobs, employment income, and sales volume within the local economy (similar to what would be seen under Caretaker Status). These effects are expected only within the short-term and are expected to turn around when the redevelopment is underway.

Indirect. Long-term minor beneficial and short- and long-term minor adverse effects would be expected. Increased employment and expenditures from closure and redevelopment and remediation activities would generate indirect increases in jobs, local sales volume, income, and tax revenues in the regional economy. Disposal could also saturate the local real estate market with low-cost commercial and office vacancies, as well as create additional burdens on public sector entities for management of site resources. This effect would be largely within the sub-ROI and take place in the short-term. Furthermore, it would not affect the entire ROI equally. Following transfer and redevelopment, flooding of renovated existing historic structures (including residential and commercial property) and new buildings may result in long-term economic losses and public safety concerns. As outlined in the reuse plan, additional flood protection measures and flooding risks (including long-term sea level rise concerns) will be evaluated during the course of redevelopment to reduce these risks.

The sub-ROI would experience minor adverse impacts in the short-term, immediately following transfer. Indirect job losses and associated income, as well as sales volume losses, will affect the sub-ROI before redevelopment begins (similar to what would be seen under Caretaker Status). These affects would be expected to turn around when redevelopment is underway.

Sociological Environment (Including Environmental Justice and Protection of Children)

Direct. Long-term minor beneficial and short- and long-term minor adverse effects would be expected. Increased employment resulting from early transfer would result in increased housing demand earlier than would happen under traditional disposal. Low-income populations, particularly within and near the sub-ROI, would benefit from the creation of low-skill and unskilled jobs associated with economic redevelopment of the properties and experience increased household incomes. Early transfer is not expected to create impacts that disproportionately affect homeless programs or minority communities in the ROI. Some risk to children and others may exist in areas undergoing environmental remediation and would require restricted access until remediation is complete.

Immediately after transfer and before redevelopment, which will increase unemployment within the sub-ROI, the sub-ROI would experience minor short-term adverse impacts.

Initially, when Fort Monroe closes job losses may cause people to move away from the area and a contraction in population.

Indirect. Short- and long-term minor adverse effects would be expected. Employment growth under early transfer would lead more quickly to increased demand for public services, schools, and infrastructure, particularly within the sub-ROI.

Within the sub-ROI, the reduction in population (particularly in the immediate short-term after closure) would also create a reduction in housing demand and a corresponding increase in residential and office vacancies (similar to what would be expected under Caretaker Status).

Quality of Life

Direct. Short- and long-term minor adverse and beneficial effects would be expected. The effect of increased direct employment and on-site residential development (addition of up to 1,500 residential units after 20 years of full build-out, or 75 units per year on average) at the Fort Monroe property could expand the population of local school systems and increase demand for other public services, causing minor adverse effects. Given the size of the urban area, such a change would only result in minor adverse effects to school systems and other public services. In addition, flooding of renovated historic structures (including residential and commercial property) and new buildings may result in public safety concerns. As outlined in the Reuse Plan, additional flood protection measures and flooding risks (including long-term sea level rise concerns) will be evaluated, studied, and addressed during the course of redevelopment to reduce these risks. On the other hand, transfer of the site to a public entity would create additional open space for public recreation which would create beneficial effects. These impacts will likely be localized within the sub-ROI rather than taking place throughout the ROI in the long-term and would take place sooner than under traditional disposal.

Within the sub-ROI, the initial closure of Fort Monroe may result in temporary discontinued recreation opportunities for residents within the sub-ROI. Reduced staffing on the site before redevelopment begins could result in increased opportunities for vandalism and property theft, as well as longer response times for fire and medical emergencies on the site (similar to what would be expected under Caretaker Status). These effects are only expected in the short-term and only until redevelopment gets underway.

Indirect. Long-term minor adverse and beneficial effects would be expected. Adverse effects could result from induced regional economic growth from redevelopment activities within the region. Induced growth may increase regional population levels, school enrollment, transportation, and demand for public services, largely within the sub-ROI. On the other hand increased access to Fort Monroe will enhance recreational and tourism opportunities to the general public, thereby creating beneficial effects.

Installation Agreements

Direct. No direct effects are expected.

Indirect. Short-term minor adverse effects would be expected within the sub-ROI. Transfer of the installation properties to the community would create expanded responsibilities, and possibly minor delayed response times during certain events, for local fire departments, law enforcement agencies, and emergency medical care providers.

4.10.2.2 Traditional Disposal Alternative

Economic Development

Direct. Long-term moderate beneficial and short-term minor adverse effects would be expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Indirect. Long-term minor beneficial and short- and long-term minor adverse effects would be expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Sociological Environment (Including Environmental Justice and Protection of Children)

Direct. Long-term minor beneficial and short- and long-term minor adverse effects would be expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Indirect. Short- and long-term negligible to minor adverse effects would be expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Quality of Life

Direct. Short- and long-term minor adverse and beneficial effects would be expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Indirect. Short-term negligible adverse effects are expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

Installation Agreements

Direct. No direct effects are expected.

Indirect. Short-term minor adverse effects would be expected. Effects would be similar to those described under the early transfer disposal alternative, but would occur over a longer period.

4.10.2.3 Caretaker Status Alternative

Economic Development

Direct. Short- and long-term minor adverse effects would be expected for Fort Monroe. Closure of Fort Monroe under caretaker status would result in the direct loss of 1,121 jobs and loss of $50 million in employment income, as well as a loss of $55.9 million in sales volume in the ROI economy (see Appendix G for a description of the Economic Impact Forecast System [EIFS] model analysis and results). The economic impact of these losses would be direct and unavoidable, as well as difficult for the local economy and community. However, given the size of the ROI economy, the economic impact of these direct changes is not predicted to affect the ROI economy broadly. The sub-ROI will be more greatly affected by the economic impact, but most of the impact will be spread throughout the entire ROI.

Indirect. Short- and long-term minor adverse effects would be expected. Under caretaker status, the loss of Fort Monroe direct employment and expenditures would translate to an unavoidable loss of 825 additional indirect jobs and more than $33.4 million in income. Secondary sales volume would be expected to decrease by $124.6 million.

Caretaker status would also represent unavoidable foregone economic opportunity (e.g., job creation, sales and expenditures, and tax revenues) until Fort Monroe is conveyed to the community. Additionally, depending on how long the properties remain under caretaker status and the level of dilapidation the infrastructure suffers, facilities and local infrastructure could degrade over time, increasing costs for future development, which will affect the sub-ROI. The socioeconomic impact of these total (direct and indirect) changes, however, is not predicted to exceed historical thresholds for socioeconomic change and sustainability in the ROI and can be expected to be reversed when the property enters into redevelopment.

Sociological Environment (Including Environmental Justice and Protection of Children)

Direct. Long-term minor adverse effects would be expected. Depending on how long the property remains in caretaker status and the ability of Fort Monroe employees to find other work, as many as 851 individuals may move from the area, resulting in a contraction in the population.

Caretaker status would not be expected to create effects that disproportionately affect homeless programs or minority or low-income communities within the ROI. Furthermore, access control and security measures will continue under caretaker status; therefore, no disproportionate risks to children are expected.

Indirect. Short- and long-term minor adverse effects would be expected, particularly within the sub-ROI. Although security access would be controlled, reduced employee presence on Fort Monroe may reduce the level of on-site security to prevent trespassers on the site.

This could create potentially hazardous conditions for the safety and well-being of children and individuals who may trespass in areas undergoing environmental remediation.

In addition, departure of Fort Monroe employees from the community could result in a short-term reduction of housing demand, with a corresponding increase in the number of residential and office vacancies in the local real estate market. These effects would be localized, they would not affect the entire ROI equally, and the total economic impact (direct and indirect) of population change is not expected to exceed historical thresholds for socioeconomic change and sustainability within the ROI. The sub-ROI already has a lower vacancy rate than the greater ROI and the state, so the anticipated impacts would be minor.

Quality of Life

Direct. Short-term minor adverse effects would be expected. Discontinuation of the daily presence of the installation workforce at Fort Monroe could potentially create increased opportunity for vandalism, property theft, and other criminal activity. Reduced staffing could also result in less timely discovery of fire and longer fire-fighting response times, as well as longer response times for medical emergencies for the caretaker force or visitors to the properties. Together these could result in adverse impacts for human safety and natural resources on the properties, particularly within the sub-ROI.

Caretaker status may also result in discontinued recreational boating opportunities and reduced access to the marina for military personnel and their families.

Indirect. No indirect effects would be expected.

Installation Agreements

Direct: No direct effects would be expected.

Indirect. No indirect effects would be expected.

4.10.2.4 No Action Alternative

No direct or indirect effects would be expected under the no action alternative. For this alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure and realignment, which would have no effect on any socioeconomic metrics in the immediate vicinity of Fort Monroe, nor within the ROI. Overall, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.10.2.5 Intensity-Based Probable Use Scenario

Socioeconomic Impact Assessment Method of Analysis

To determine the secondary socioeconomic effects of the implementation of the three reuse scenarios for Fort Monroe, the EIFS model was used. The EIFS model is a computer-based economic tool that calculates multipliers to estimate the direct and

indirect impacts resulting from a given action. The model requires input data: the names of counties comprising the ROI, the number and income of civilian and military personnel affected by the action and reuse scenarios, change in local expenditures due to the action and reuse scenarios, the number of civilians expected to relocate, and the number of military personnel who live on base. Changes in employment and spending represent direct effects resulting from the action and reuse scenarios. Forecast changes in ROI sales volume, employment, income, and population represent indirect effects and are based on the input data and calculated multipliers within the model.

For the purposes of analysis, a change is considered significant if it falls outside the normal range of ROI economic variation. To determine normal variability, the EIFS model calculates a rational threshold value (RTV) profile for the ROI based on historical fluctuations in sales volume, employment, income, and population patterns. The historic extremes for the ROI become the threshold of significance for social and economic change. If the calculated effect of a reuse scenario falls outside the RTV, the impact is considered significant. Appendix G describes the EIFS model in detail, as well as the calculation of input parameters, and presents model input and output tables and RTV parameters for the reuse scenarios considered.

For the three (Lower, Middle, and Upper Bracket) scenarios, the year(s) of expected maximum economic change in the ROI economy were modeled over the 20-year phased build-out period on an annualized basis. The year(s) of maximum economic change are expected to occur after Fort Monroe closure, with a short-term pulse in employment and expenditures during three five-year periods of peak construction over the 20-year build-out period. These peak year estimates are considered to exceed the average annual change in economic activity over the 20 years but are well below the cumulative effect, as the EIFS model provides an assessment of annual change in economic activity. The year(s) of maximum economic change are expected to take place during the full brunt of the economic loss of jobs and expenditures from the Fort Monroe closure. Expected impacts of the reuse scenarios during the year(s) of maximum economic change are discussed below along with their EIFS output reports. Table 4.10-9 presents EIFS model input assumptions and projected outputs and change for the three reuse scenarios during the predicted peak year(s) of economic change over the 20-year phased build-out period. Appendix G presents a complete discussion of the EIFS model, calculation of input parameters, and output tables.

Economic Development

Lower Bracket, Direct. Short- and long-term minor adverse and long-term minor beneficial effects would be expected. A Lower Bracket scenario during year(s) of peak economic activity could create an adverse impact on job creation and income generation, but beneficial effects are expected for sales and expenditures and associated tax revenues. Table 4.10-9 shows that during the peak construction year(s), there would be an estimated 186 fewer direct jobs during peak year(s) of economic activity than before base closure, with direct decreases of more than $9 million in income. Some of these adverse effects are anticipated in the period immediately following base closure, before initiation of

remediation, construction, and reuse activities. During peak construction year(s), there would also be direct increases in sales volume (almost $60.6 million) associated with reuse. The effects would be largely localized (within the sub-ROI) and not affect the ROI equally. Although the intensity of the impact will be felt more within the sub-ROI, they effects will remain minor the moderate within the sub-ROI.

The sub-ROI will experience short-term minor adverse effects before redevelopment begins. There will initially be direct loss of jobs, employment income, and sales volume within the local economy (similar to what would be seen under Caretaker Status). These effects are expected only within the short-term and are expected to turn around when redevelopment gets underway.

Lower Bracket, Indirect. Short- and long-term minor beneficial and short-term minor adverse effects would be expected. Spending related to reuse could result in increases in secondary employment (896 jobs), income generation ($36 million), sales and expenditures ($135 million), and associated tax revenues. The long-term transition to increased residential, commercial, cultural and tourism activities on the site would also create a new diversified secondary economy and tax base. The effects would be largely localized within the sub-ROI and would not affect the ROI equally.

The sub-ROI is expected to experience minor adverse effects in the short-term. Indirect job losses and associated income, as well as sales volume losses, will affect the sub-ROI before redevelopment gets underway (similar to what would be seen under Caretaker Status). These impacts will be expected to turn around when redevelopment gets underway.

Table 4.10-9 EIFS Model Output: Fort Monroe Reuse Intensity Scenarios

ANNUAL INPUT PARAMETERS [1]			
Reuse Intensity Scenario	**Lower Bracket Intensity**	**Middle Bracket Intensity**	**Upper Bracket Intensity**
Change in Local Expenditures (max annual)	$79,000,000	$168,000,000	$222,800,000
Net Change in Civilian Employment (max annual)	(293)	361	770
Change in Military Employment	(295)	(295)	(295)
Average Income of Affected Civilian	$43,250	$43,250	$43,250
Average Income of Affected Military	$60,568	$60,568	$60,568
Percent Expected to Relocate	20	20	20

ANNUAL FORECAST OUTPUT							
	Lower Bracket		**Middle Bracket**		**Upper Bracket**		**RTV Range (percent)**
	Projected Change	**Percent Change**	**Projected Change**	**Percent Change**	**Projected Change**	**Percent Change**	
Sales Volume							
Direct	$60,645,140		$172,386,700		$241,408,800		
Indirect	$135,238,700		$384,422,300		$538,341,800		-6.99 - 10.91
Sales Total	$195,883,800	0.59%	$556,809,000	1.69%	$779,750,600	2.36%	
Employment							
Direct	(186)		1,208		2,074		
Indirect	896		2,546		3,566		
Employment Total	709	0.08%	3,754	0.41%	5,639	0.61%	-2.97 – 2.79
Income							
Direct	($9,320,758)		$42,869,690		$75,277,960		
Indirect	$36,324,460		$103,254,000		$144,596,000		
Total (place of work)	$27,003,702	0.08%	$146,123,700	0.41%	$219,874,000	0.62%	-5.71 – 10.6

[1] Sources and calculations of input parameters are presented in Appendix G

Lower Bracket, Direct plus Indirect. Short- and long-term minor beneficial and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. Table 4.10-9 shows that during peak construction year(s), there would be an estimated 709 new total (direct plus indirect) jobs, which represents an increase of 0.08 percent in the ROI. The short-term infusion of construction jobs could help regional and local employment to the extent that local skills match the needs of remediation,

construction, infrastructure rehabilitation, and associated employment demands. Total income generation (direct and indirect) could increase by about $27 million, or 0.08 percent, and total sales volumes (direct and indirect) are expected to increase by almost $195.9 million, or 0.59 percent. The long-term transition to increased residential, commercial, cultural and tourism activities on the site would reorient the diversity of economic activity and employment opportunity on the site. The economic impact of total changes in sales volume and employment during the peak construction year(s) would be experienced throughout the ROI, with the highest intensity experienced within the sub-ROI. Overall, the change in economic activity is predicted to be within historical thresholds for socioeconomic change and sustainability in the ROI.

In the short-term, before the redevelopment begins, the sub-ROI will experience adverse impacts, primarily from direct and indirect job loss, income generation, and sales volume (similar to what is expected under Caretaker Status). These effects are only expected until redevelopment gets underway and additional jobs are created.

Middle Bracket, Direct. Short- and long-term moderate beneficial impacts and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. A Middle Bracket scenario during a year or years of maximum economic change could create beneficial impacts for long-term direct job creation, income generation, and sales and expenditures. Table 4.10-9 shows that there would be an estimated 1,208 more direct jobs during peak year(s) of economic activity than before base closure, with direct increases of more than $42.8 million in income. The economic activity is also a reflection of the heavy transition to residential land use on the site but does not reflect anticipated future incomes from leasing and recreation. The impacts would be experienced throughout the ROI, with the highest intensity experienced within the sub-ROI.

The sub-ROI will experience short-term minor adverse affects before redevelopment gets underway. There will initially be direct loss of jobs, employment income, and sales volume in the local economy, similar to what would be expected under Caretaker Status, but these impacts are expected only in the short-term and are expected to be reversed when redevelopment gets underway.

Middle Bracket, Indirect. Short- and long-term minor beneficial and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. Spending related to reuse could also result in increases in secondary employment (2,546 jobs), income generation ($103 million), sales and expenditures ($384 million), and associated tax revenues. The long-term transition to increased residential, commercial, cultural and tourism activities on the site would create a new diversified secondary economy and tax base. The impacts would be largely localized and not affect the ROI equally. Following transfer and redevelopment, flooding of renovated historic structures (including residential and commercial property) and new buildings may result in long-term economic losses and public safety concerns. As outlined in the reuse plan, additional flood protection measures and flooding risks (including long-term sea level rise concerns) will be evaluated, studied, and addressed during the course of redevelopment to reduce these risks.

In the short-term, the sub-ROI is expected to experience minor adverse impacts. Indirect job losses and associated income, as well as sales volume losses, will affect the sub-ROI before redevelopment begins (similar to what would be expected under Caretaker Status). These affects are expected to turn around once redevelopment is underway.

Middle Bracket, Direct plus Indirect. Short- and long-term moderate beneficial and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. Table 4.10-9 shows that during peak construction year(s), there would be an estimated 3,754 total new (direct and indirect) jobs, which represents an increase of 0.41 percent in the ROI. The short-term infusion of construction jobs could help to reduce regional and local unemployment to the extent that local skills match the needs of remediation, construction, infrastructure rehabilitation, and associated employment demands. Total income generation (direct and indirect) could increase by about $146 million, or 0.41 percent, and total sales volumes (direct and indirect) could increase by more than $556.8 million, or 1.69 percent. The long-term transition to increased residential, commercial, cultural and tourism activities on the site would reorient the diversity of economic activity and employment opportunity on the site. The economic impact of total changes in sales volume, income, and employment during the peak construction year(s) would be experienced throughout the ROI, with the highest intensity experienced within the sub-ROI. Overall, the change in economic activity is predicted to be within historical thresholds for socioeconomic change and sustainability in the ROI.

In the short-term, before the redevelopment begins, the sub-ROI will experience minor adverse impacts, including direct and indirect job loss, reduced income generation, and sales volume. These affects, similar to what would be expected under Caretaker Status, are only expected in the short-term, until redevelopment gets underway and additional jobs are created.

Upper Bracket, Direct. Short- and long-term moderate beneficial and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. An Upper Bracket scenario during a year of maximum economic change could create direct beneficial impacts for job creation, income generation, sales and expenditures, and tax revenues. Table 4.10-9 shows that there would be an estimated direct increase of approximately 2,074 jobs, $75 million in income, and $241 million in sales volume. The impacts would be largely localized and would not affect the ROI equally.

The sub-ROI is expected to experience short-term minor adverse affects before redevelopment begins. There will initially be direct loss of jobs, employment income, and sales volume in the local economy, similar to what would be expected under Caretaker Status. These impacts are expected only in the short-term and are expected to be reversed when redevelopment gets underway.

Upper Bracket, Indirect. Short- and long-term minor beneficial and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. Spending related to reuse could also result in increases in secondary employment (3,566 jobs), income generation ($144.6 million), sales and expenditures ($538 million),

and associated tax revenues. The long-term transition to increased residential, commercial, cultural, and tourism activities on the site would also create a diversified secondary economy and tax base. The impacts would be largely localized and would not affect the ROI equally. Following transfer and redevelopment, flooding of renovated historic structures (including residential and commercial property) and new buildings may result in long-term economic losses and public safety concerns. As outlined in the reuse plan, additional flood protection measures and flooding risks (including long-term sea level rise concerns) will be evaluated, studied, and addressed during the course of redevelopment to reduce these risks.

The sub-ROI is expected to experience short-term minor adverse impacts. Indirect job losses and associated income, as well as sales volume losses, will affect the sub-ROI in the short-term before redevelopment begins. These affects are expected to turn around when redevelopment gets underway.

Upper Bracket, Direct plus Indirect. Short- and long-term moderate beneficial and short-term minor adverse impacts would be expected, with the highest intensity of effect felt within the sub-ROI. Table 4.10-9 shows that during peak construction year(s), there would be an estimated 5,639 total new (direct and indirect) jobs, which represents an increase of 0.61 percent in the ROI. The short-term infusion of construction jobs could help to reduce regional and local unemployment to the extent that local skills match the needs of remediation, construction, infrastructure rehabilitation, and associated employment demands. Total income generation (direct and indirect) could increase by about $219.8 million, or 0.62 percent, and total sales volumes (direct and indirect) could increase by more than $779 million, or 2.36 percent. The transition to increased residential, commercial, cultural, and tourism activities on the site would reorient the diversity of economic activity and employment opportunity on the site. The economic impact of total changes in sales volume, employment, and income during peak construction year(s) would be experienced throughout the ROI, with the highest intensity experienced within the sub-ROI. Overall, the change in economic activity is predicted to be within historical thresholds for socioeconomic change and sustainability in the ROI.

In the short-term, before the redevelopment begins, the sub-ROI will experience adverse impacts, including direct and indirect job loss, income generation loss, and sales volume loss. These affects are only expected until redevelopment gets underway and additional jobs are created.

Sociological Environment (Including Environmental Justice and Protection of Children)

Lower Bracket, Direct. Short-term minor beneficial and adverse effects would be expected. The population in the region is expected to decrease as a result of net changes in civilian and military employment (jobs lost or moving outside of the ROI) from base closure. The impact would be heavily localized and not affect the ROI equally. As slight contraction of the population would be expected to take place within the sub-ROI, creating minor adverse impacts (similar to what would be expected under Caretaker Status).

The Lower Bracket scenario for Fort Monroe would not create disproportionately high or adverse human health or environmental impacts on minority or low-income populations in surrounding communities. Low-income populations could benefit from the creation of low-skill and unskilled jobs, especially during peak construction times. No effects are expected for environmental justice or homeless and other special programs.

Recreation areas will be placed away from the light construction projects under this scenario, so no disproportionate risks to children are expected. There is also not any anticipated industrial reuse, so it does not pose a disproportionate risk to children visiting the Fort Monroe site.

Lower Bracket, Indirect. Short-term minor adverse and beneficial effects would be expected. The net decrease in population following the relocation of jobs under this scenario could decrease demand on public services and infrastructure which would generate minor beneficial effects. On the other hand, reduced employment opportunities caused by direct and indirect economic factors will adversely affect household income and family well-being, and indirectly affect the social well-being of the area.

Within the sub-ROI, the reduction in population (particularly in the immediate short-term after closure) would also create a reduction in housing demand and a corresponding increase in residential and office vacancies (similar to what would be expected under Caretaker Status).

Middle Bracket, Direct. Short-term minor adverse effects would be expected. The minor increase in population to the region (due to jobs, tourism, and increased housing) may increase competition for low-income jobs created by the redevelopment of Fort Monroe. The impact would be localized and would not affect the ROI equally.

In the short-term, the sub-ROI will experience minor adverse impacts. Initially, when Fort Monroe closes and before redevelopment begins, job losses may cause people to move away from the area resulting in a slight contraction in population.

The Middle Bracket scenario for Fort Monroe would not create disproportionately high or adverse human health or environmental impacts on minority or low-income populations in surrounding communities. Low-income populations could benefit from the creation of low-skill and unskilled jobs, especially during peak construction years. No effects are expected for environmental justice or homeless and other special programs.

Recreation and residential areas will be placed away from any light industrial or commercial areas under this scenario, so no disproportionate risks to children are expected.

Middle Bracket, Indirect. Short-term minor adverse effects would be expected. Population increases (up to one percent increase in the City of Hampton following full build-out) resulting from tourism revenues, jobs, and new housing could increase demand on public services and infrastructure. Over time, increased demand for public services

associated with increased residential, commercial, and tourist populations could be funded by associated increases in sales, income, and property tax revenues.

Within the sub-ROI in the short-term, there may be a reduction in housing demand and a corresponding increase in residential and office vacancies. This is expected to only last until redevelopment begins.

Upper Bracket, Direct. Short-term minor adverse effects would be expected. The minor increase in population to the region (due to jobs, tourism, and increased housing) may increase competition for low-income jobs created by the redevelopment of Fort Monroe. The impact would be heavily localized and would not affect the ROI equally.

In the short-term, the sub-ROI will experience minor adverse impacts. Initially, when Fort Monroe closes and before redevelopment begins, job losses may cause people to move away from the area resulting in a slight contraction in population.

The Upper Bracket scenario for Fort Monroe property would not create disproportionately high or adverse human health or environmental impacts on minority or low-income populations of the surrounding communities. Low-income populations could benefit from the creation of low-skill and unskilled jobs (especially during peak construction years). No impacts are expected for environmental justice or homeless and other special programs.

Recreation and residential areas will be placed away from any light industrial or commercial areas under this scenario, so no disproportionate risks to children are expected.

Upper Bracket, Indirect. Short-term minor adverse effects would be expected. Population increase (up to a two percent increase in the City of Hampton following full build-out) resulting from tourism revenues, jobs, and new housing could increase demand on public services and infrastructure. Over time, increased demand for public services associated with increased residential, commercial, and tourist populations could be funded by associated increases in sales, income and property tax revenues.

Within the sub-ROI in the short-term, there may be a reduction in housing demand and a corresponding increase in residential and office vacancies. This is expected to only last until redevelopment begins.

Quality of Life

Lower Bracket, Direct. Long-term minor beneficial and short-term minor adverse effects would be expected (principally within the sub-ROI). The Lower Bracket scenario would have very little residential development, with a net decline in on-site residential populations as compared to baseline conditions. Therefore, there would be a net decrease in the demand for public services, resulting in minor beneficial effects. For residents in the immediate vicinity of Fort Monroe, the Lower Bracket scenario would include many new recreation opportunities within the Fort Monroe property, which would be a benefit to the local area.

Within the sub-ROI, the initial closure of Fort Monroe may result in discontinued recreation opportunities for residents within the sub-ROI. Reduced staffing on the site before redevelopment begins could result in increased opportunities for vandalism and property theft, as well as longer response times for fire and medical emergencies on the site (similar to what would be expected under Caretaker Status). These impacts are only expected in the short term, and only until redevelopment gets underway.

Lower Bracket, Indirect. Long-term minor beneficial effects would be expected. Beyond the local area, increased access to Fort Monroe will enhance recreational and tourism opportunities to the general public (both in the ROI and beyond), thereby creating beneficial indirect effects. These effects would be felt more locally within the sub-ROI.

Middle Bracket, Direct. Short- and long-term minor adverse and long-term beneficial effects would be expected (principally within the sub-ROI). Adverse impacts could result from an increase in on-site residential population (up to 1,300 residential units at 6 units per acre) and increased population growth in the local area of up to one percent. This growth will generate small and localized increases in school enrollment, transportation, and demand for public services, resulting in minor adverse effects (principally within the sub-ROI). On the other hand, the Middle Bracket scenario would provide many new recreational opportunities for new residents living on Fort Monroe and for nearby residents in the immediate vicinity of Fort Monroe.

Within the sub-ROI, the initial closure of Fort Monroe may result in discontinued recreation opportunities for residents within the sub-ROI. Reduced staffing on the site before redevelopment begins could result in increased opportunities for vandalism and property theft, as well as longer response times for fire and medical emergencies on the Fort Monroe site. These impacts are only expected in the short term, and only until redevelopment gets underway.

Middle Bracket, Indirect. Long-term minor adverse and beneficial effects would be expected (principally within the sub-ROI). Adverse impacts could result from induced regional economic growth and employment from redevelopment activities within the region (maximum year increase of up to 1.7 percent in sales and 0.4 percent in employment). Induced regional growth may generate small and localized increases in population levels, school enrollment, transportation, and demand for public services. On the other hand, increased access to Fort Monroe will enhance recreational and tourism opportunities to the general public, thereby creating beneficial effects. In addition, potential flooding of renovated historic structures (including residential and commercial property) and new buildings may result in public safety concerns. As outlined in the reuse plan, additional flood protection measures and flooding risks (including long-term sea level rise concerns) will be evaluated, studied, and addressed during the course of redevelopment to reduce these risks. No additional impacts are expected within the sub-ROI.

Upper Bracket, Direct. Short- and long-term minor adverse and long-term beneficial effects would be expected (principally within the sub-ROI). Adverse impacts could result from an increase in on-site residential population (up to 1,500 residential units at 7 units

per acre) and increased population growth in the local area of up to two percent. This growth will generate small and localized increases in school enrollment, transportation, and demand for public services, resulting in minor adverse effects. On the other hand, the Upper Bracket scenario would provide many new recreational opportunities for new residents living on Fort Monroe and for nearby residents in the immediate vicinity of Fort Monroe.

Within the sub-ROI, the initial closure of Fort Monroe may result in discontinued recreation opportunities for residents within the sub-ROI. Reduced staffing on the site before redevelopment begins could result in increased opportunities for vandalism and property theft, as well as longer response times for fire and medical emergencies on the Fort Monroe site. These impacts are only expected in the short term, and only until redevelopment gets underway.

Upper Bracket, Indirect. Long-term minor adverse and beneficial effects would be expected (principally within the sub-ROI). As previously discussed, adverse impacts could result from induced regional economic growth and employment from redevelopment activities within the region (maximum year increase of up to 2 percent in sales and 0.6 percent in employment). On the other hand, increased access to Fort Monroe will enhance recreational and tourism opportunities to the general public, thereby creating beneficial effects. In addition, potential flooding of renovated historic structures (including residential and commercial property) and new buildings may result in public safety concerns. As outlined in the reuse plan, additional flood protection measures and flooding risks (including long-term sea level rise concerns) will be evaluated, studied, and addressed during the course of redevelopment to reduce these risks. No additional impacts are expected within the sub-ROI.

Installation Agreements

Lower Bracket, Direct. No effects would be expected. Installation agreements between the Army and local agencies for the provision of various services would be continued until disposal of the installation was complete. Those services are presently provided, and would continue to be provided, by local agency suppliers outside the boundaries of Fort Monroe.

Lower Bracket, Indirect. No effects would be expected within the ROI and sub-ROI.

Middle Bracket, Direct. No effects would be expected. Installation agreements between the Army and local agencies for the provision of various services would be continued until disposal of the installation was complete. Those services are presently provided, and would continue to be provided, by local agency suppliers outside the boundaries of Fort Monroe. No additional effects are expected to impact the sub-ROI.

Middle Bracket, Indirect. No effects would be expected within the ROI and sub-ROI.

Upper Bracket, Direct. No effects would be expected. Installation agreements between the Army and local agencies for the provision of various services would be continued until

disposal of the installation properties was complete. Those services are presently provided, and would continue to be provided, by local agency suppliers outside the boundaries of Fort Monroe. No additional effects are expected to impact the sub-ROI.

Upper Bracket, Indirect. No effects are expected within the ROI and sub-ROI.

4.11 TRANSPORTATION

4.11.1 Affected Environment

The affected environment, with relation to transportation, is the roadway network internal to Fort Monroe and the external street network in the City of Hampton. Within the city limits, the primary roadways of concern in the Phoebus community are along Mallory Street between I-64 and Mercury Boulevard. The study area also encompasses four signalized intersections at two interchanges with I-64 at Mallory Street and Woodland Road. Study area roadways are highlighted in red within Figure 4.11-1.

Figure 4.11-1 Fort Monroe Surrounding Roadways

4.11.1.1 Roadways and Traffic

Today, all access into and out of Fort Monroe occurs at a single five-legged intersection. There are two roadways in the City of Hampton (Mellen Street and Mercury Boulevard) that intersect from the north to form two of the five legs. These two roadways traverse through the adjacent Phoebus neighborhood and provide access to I-64 and other parts of the city. Internal to Fort Monroe, McNair Drive, Ingalls Road, and Stillwell Drive create the remaining three legs of this intersection, as illustrated in Figure 4.11-2.

Figure 4.11-2 Fort Monroe South Gate Roadway Network

There are several key framework streets that provide mobility to Fort Monroe within the City of Hampton including Mallory Street, Mellen Street, Mercury Boulevard, Woodland/Settlers Landing Road, and County Street. Average Daily Traffic (ADT) count data for these roadways are shown in Table 4.11-1.

Table 4.11-1 ADT Counts for Roadways External to Fort Monroe

Location (Year of Count)	Average Daily Traffic Vehicles Per Day
Mallory Street from I-64 to County Street (2005)	7,100
Mallory Street from County Street to Mercury Boulevard (2005)	7,100
Mallory Street from Mercury Boulevard to Pembroke Avenue (2005)	6,900
Mellen Street from Mallory Street to Mercury Boulevard (2005)	5,100
Mercury Boulevard from Mellen Street to Mallory Street (2005)	4,400
Mercury Boulevard from Mallory Street to Woodland Road (2005)	9,800
Woodland Road from I-64 to County Street (2005)	23,300
Woodland Road from County Street to Mercury Boulevard (2005)	17,800
County Street from Mallory Street to Woodland Road (2006)	5,200

As part of a recent city project to construct streetscape improvements in the Phoebus community, Mallory Street varies between two and four lanes within the study area. From the I-64 interchange east to Mercury Boulevard, Mallory Street is a two-lane undivided roadway with on-street parking. East of Mercury Boulevard, Mallory Street is a four-lane median divided roadway. Mallory Street is a key portal in the City of Hampton. It is the first interchange with I-64 north of the HRBT and is the primary link between the communities of Phoebus and Buckroe Beach. Once on Mallory Street, access into Fort Monroe is provided by a connection with Mellen Street. Similar to Mallory Street, Mellen Street was also part of the recent streetscape improvements. Mellen Street is a two-lane roadway with on-street parking which connects Mallory Street with the Mugler Bridge over Mill Creek. The Mugler Bridge is a two-lane bridge with a narrow sidewalk located on one side.

In addition to Mellen Street, access to Fort Monroe is also provided along Mallory Street at Mercury Boulevard, which also has a bridge crossing Mill Creek. Mercury Boulevard is a four-lane undivided roadway between Mallory Street and Willard Avenue and continues southwest of Willard Avenue as a four-lane undivided bridge. Mercury Boulevard is the primary hurricane evacuation route for residents of Phoebus, Buckroe, and Fort Monroe. As Mercury Boulevard extends northeast, it intersects Woodland Road/Settlers Landing Road before continuing through the city.

Woodland/Settlers Landing Road is a four-lane roadway with interchange access to I-64 west of County Street. This roadway, which is currently posted with a 35 miles per hour (mph) speed limit, is undivided northeast of County Street, before it becomes a median-divided roadway between County Street and the I-64 interchange. County Street is a three-lane, undivided roadway with a posted speed limit of 35 mph.

4.11.1.2 Installation Transportation

As shown in Figure 4.11-2, there are three main roadways at the south gate entrance, McNair Drive, Ingalls Road, and Stillwell Drive. There are also two other major collector roads which traverse the fort, Fenwick Road and Patch Road. Additionally, there are many local neighborhood streets forming the internal roadway network, much of which has been resurfaced in the last few years following the damage from Hurricane Isabel. Figure 4.11-3 illustrates the general roadway network internal to Fort Monroe.

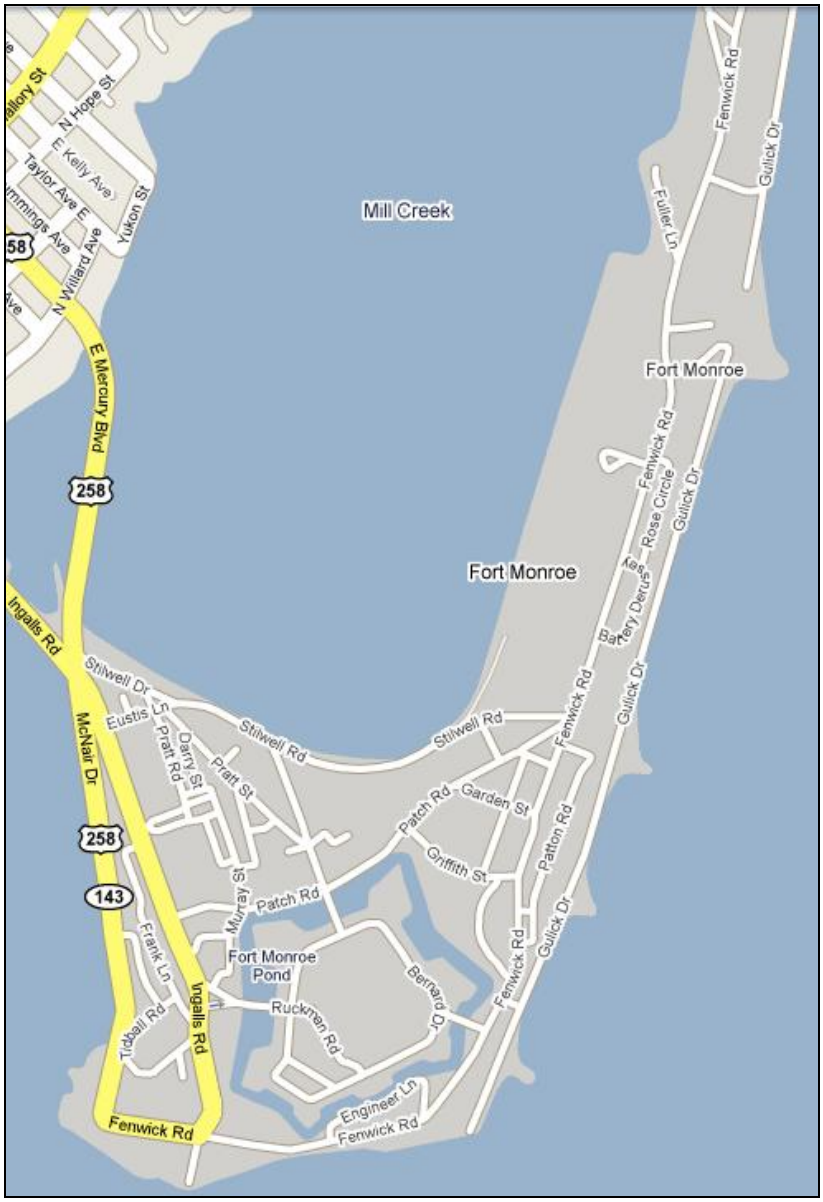


Figure 4.11-3 Fort Monroe Internal Roadway Network

McNair Drive is located on the westernmost edge of Fort Monroe. This four-lane undivided roadway extends from the Fort Monroe entrance south to Fenwick Road and functions as the major thoroughfare to the fort. Since the increased security requirements of post 9/11, McNair Drive houses the security check booth, day pass administration booth, and staging area for random security checks resulting in control of speed and access along the roadway.

Ingalls Road is a north-south arterial parallel to McNair Drive that provides access to several administrative buildings as well as some residential areas of Fort Monroe. Ingalls

Road is a three-lane roadway, with the center lane operating as a turn-lane. At the northern section adjacent to the main entrance, Ingalls Road operates with two southbound lanes during the morning peak period (7:00 AM to 9:00 AM) and two northbound lanes during the evening peak period (4:00 PM to 6:00 PM). This lane utilization allows the roadway to better accommodate peak traffic conditions associated with the current operations at Fort Monroe.

Stillwell Drive is a northwest-southeast arterial adjacent to Mill Creek that extends from the main entrance to Fenwick Road, which it intersects just north of Patch Road. Stillwell Drive is a two-lane undivided roadway with curb and gutter to the east and a paved shoulder to the west. Stillwell Drive creates the fifth leg of the main gate intersection and is only used for ingress and egress at the main gate during peak traffic periods. During the AM peak period, Stillwell Drive provides an additional inbound lane, and conversely during the PM peak, it provides an additional outbound lane at the main gate. Based upon the column spacing of the existing brick wall structure on either side of the roadway, it is anticipated the roadway could be widened between the existing columns to provide two-way vehicular access as well as the addition of a sidewalk for multimodal pedestrian/bicycle access.

Fenwick Road is a north-south arterial that runs parallel to the Chesapeake Bay. Fenwick Road is a two-lane undivided facility with curb and gutter in the southern residential areas. In the northern area towards Dog Beach, Fenwick Road is a two-lane undivided facility without curb and gutter or paved shoulders. Currently, there are no active uses at the north end of Fort Monroe; however, a future connection with Atlantic Avenue is proposed, which would provide a third access point to Fort Monroe. This northern connection would improve emergency access, as well as, public access to the proposed recreation uses anticipated in the north-end of the fort.

4.11.1.3 Public Transportation

Hampton Roads Transit (HRT) provides regularly scheduled transit services throughout the metropolitan area by a number of means. According to the HRT website, there is no fixed-route bus service between Fort Monroe and other areas of Hampton, however there are seasonal (summer) routes that provide service to Fort Monroe from June through September. These seasonal routes include service between Langley AFB and area attractions within the City of Hampton, such as Buckroe Beach, Historic Fort Monroe, Coliseum Central, and Downtown Hampton.

Fort Monroe staff indicated that HRT provides service directly to the fort's TRADOC facility. There are two bus routes (117 and 120) that access the Phoebus area along Mallory Street and are marked with a single sign. Route designations are depicted in Figure 4.11-4.

Given that there are no fixed HRT routes within Fort Monroe, transit-related passenger amenities are minimal. During the initial 2006 reuse development planning, recommendations stated that a majority of the bus stops be marked with highly visible signing and that actively used areas within Fort Monroe should be considered for transit stops with shelters. This recommendation relative to enhance transit features was made

with the expectation that a more attractive transit facility would increase ridership, and therefore reduce the amount of vehicle trips traversing to and from, and within Fort Monroe.

Figure 4.11-4 HRT Bus Routes Adjacent to Fort Monroe

4.11.1.4 Rail

Chessie Seaboard Multiplier (a.k.a. CSX) has rail lines traversing through neighboring City of Newport News, however there are no rail lines within Fort Monroe or in the City of Hampton.

4.11.1.5 Air Traffic and Airspace

The Newport News/Williamsburg International Airport is located approximately 15 miles northwest of Fort Monroe off Bland Boulevard in Newport News. Travel time from Fort Monroe is approximately 20 minutes during non-peak periods without incident. Norfolk International Airport is also located approximately 15 miles from Fort Monroe, but in the opposite direction, southeast, on the Southside in Norfolk, Virginia. Norfolk International Airport requires passage through the HRBT with a travel time of approximately 25 minutes during the non peak period without incident. Peak hours and incidents can significantly increase travel time to any destination Southside.

4.11.2 Consequences

4.11.2.1 Early Transfer Disposal Alternative

Direct. Short- and long-term minor to significant adverse impacts to transportation infrastructure, along with some minor beneficial effects, are expected both on and in the vicinity of Fort Monroe. Section 4.11.2.5 discusses these impacts in more detail. Residential unit density metrics and non-residential square footage development metrics from Table 3.3-3 are key input parameters for simulating vehicular trips and traffic generation. Under this alternative the Army has various property transfer and disposal methods available, allowing the reuse of property to occur before environmental remedial action has been completed. These variations may ultimately affect the manner in which land and the associated transportation network are developed, including incremental changes in ownership and redevelopment intensity. Disposing of property over time will affect the timing and intensity of transportation impacts associated with non-federal ownership and redevelopment.

For the external local street network, early transfer disposal would result in unavoidable increased traffic both on and off the installation, creating minor short-term and significant long-term adverse effects following disposal. Severity of these impacts would be dependent on the type and level of redevelopment (further discussed in Section 4.11.2.5). All external local street intersections currently operate at acceptable level of service (LOS), with some minor impacts on a few side streets occurring only during the peak periods. Internal to Fort Monroe, a gradual increase in redevelopment will equate to a gradual increase in traffic demand. This alternative will allow the existing transportation infrastructure to transition between existing and new traffic patterns over time, allowing future traffic to find alternative routes to maintain a balanced transportation network.

Indirect. Long-term moderate to significant adverse effects would be expected near Fort Monroe. In the long-term, disposal of Fort Monroe has the potential to generate additional economic growth in the region, potentially resulting in complimentary land uses such as residential and commercial traffic generators along the local street network surrounding the installation.

4.11.2.2 Traditional Disposal Alternative

Direct. Short- and long-term minor to significant impacts to transportation infrastructure similar to those outlined for early transfer are expected. Depending on the duration of build-out, if extended beyond a 20-year horizon, background traffic growth associated with other developments in the project area may absorb available road capacity so that the additional traffic generated by the proposed redevelopment at Fort Monroe may exceed acceptable LOS at a future point in time.

Indirect. Long-term moderate to significant adverse effects similar to the effects outlined for early transfer would be expected; however, they would occur further in the future.

4.11.2.3 Caretaker Status Alternative

Direct. Minor long-term adverse and beneficial effects are expected. The caretaker status alternative would arise in the event the Army is unable to dispose of any or all portions of the non-reverting property within the period of initial maintenance. This long-term maintenance, or "caretaker status" stage, would no longer be focused on keeping the facilities in a state of repair to facilitate rapid reuse. Rather, maintenance during this period would consist of minimal activities intended primarily to ensure security, health, and safety and to avoid physical deterioration. Internal and external roadways and travel patterns would benefit, given the reduction in civilian and military traffic accessing the installation. However, reduced maintenance over a prolonged (approximately 5-10 years) period under caretaker status would result in gradual deterioration of on-site roads and other multimodal facilities such as multiuse paths and recreational facilities.

Indirect. There are no indirect effects expected with this alternative.

4.11.2.4 No Action Alternative

No direct or indirect effects are expected with this alternative. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendation for closure, thus no effects would occur relative to the continuation of the Army's mission relative to condition in November 2005.

4.11.2.5 Intensity-Based Probable Use Scenario

Method of Analysis. Analysis of the roadways surrounding Fort Monroe consisted of generating the potential trips associated with the reuse of Fort Monroe and then assigning these trips to the external local street network. Residential unit density metrics and non-residential square footage development metrics from Table 3.3-3 are key input parameters for simulating vehicular trips and traffic generation. Appendix H contains the results of traffic modeling, detailed analysis and supporting calculations upon which this discussion is based.

The traffic generation potential for the proposed reuse of Fort Monroe is defined as the net difference in existing and proposed trips generated by the type and size of use. The total existing daily trips at Fort Monroe is 10,500. The trip generation was determined for five categories of land use, which included residential, office, commercial, lodging, and tourism. These uses were summarized by quantity using traffic generation rates published in *Trip Generation* (Institute of Transportation Engineers, 7th Edition) for the AM, PM, and Saturday peak hours. Table 4.11-2 summarizes the net trip generation potential for the five land use categories of the proposed Fort Monroe reuse.

Table 4.11-2 illustrates that, under the Middle Bracket scenario, the proposed reuse has the potential to generate 24,040 additional daily trips, or approximately 3.3 times the existing 10,500 daily trip (baseline) condition, whereas with the Upper Bracket scenario, the proposed reuse has the potential to generate 29,640 additional daily trips, or approximately 3.8 times the baseline condition.

Table 4.11-2 Net Daily Trip Generation Summary

Land Use Categories	Net Change in Daily Trip Generation by Intensity Level		
	Lower Bracket	Middle Bracket	Upper Bracket
Residential	840	10,100	11,000
Commercial/Office	-5,900	13,600	18,300
Tourism/Lodging	340	340	340
Net Change	**-4,720**	**24,040**	**29,640**
TOTALTRIPS	**5,780**	**34,540**	**40,140**

However, under Lower Bracket scenario, a significant reduction in nonresidential uses would reduce the amount of daily trips currently accessing the fort by approximately 4,700 trips or approximately 45 percent less than the baseline condition.

Generating 40,140 total daily trips, the Upper Bracket scenario results in 16 percent more total trips than the Middle Bracket and six times more than the Lower Bracket scenario. With the tourism/lodging land use category, there is no difference in trip generation between the three intensity-based probability use scenarios. The commercial/office category accounts for the largest variance in range all land use categories. In addition to daily trips, peak-hour trips were also determined and distributed throughout the local street network based on knowledge of the study area and input from stakeholders and local residents. Additionally, existing traffic volumes along the external roadway network were projected to the future horizon year (2031) to account for usage increases and nonspecific growth throughout the area. All assumptions regarding trip generation, distribution, and background growth were agreed to by all stakeholders at the 12 December 2008 Traffic Assumptions meeting which included the VDOT, City of Hampton, FMFADA, and the Army. A more detailed description of assumptions is included in Appendix H.

Analyses for signalized and unsignalized intersections during the AM, PM, and Saturday peak hours were performed using Synchro Professional 6.0, which uses methodologies contained in the 2000 *Highway Capacity Manual* (Transportation Research Board 2000). Intersection turning movement counts were used along with information about the roadway capacity, including the number of lanes and traffic control, to determine existing and LOS. LOS ranges from A to F. An “A” indicates a condition of little or no congestion, and an “F” denotes a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. LOS A through D is generally considered acceptable.

Lower Bracket, Direct. Short- and long-term minor beneficial effects to roadways are expected both on and in the vicinity of Fort Monroe. The Lower Bracket scenario for Fort Monroe is the only scenario that results in a reduction of traffic when compared to the existing or baseline condition. This scenario would be commensurate with current baseline conditions with respect to building intensity, but with the added effect of tourism. The Lower Bracket scenario for Fort Monroe would lead to an overall net reduction in traffic of almost half of the existing traffic. This reduction equates to 4,720 less trips per day, relative to baseline conditions. Remaining structures would be primarily amenity based

(i.e., bank, mechanic, and recreation center) and adult senior living dwelling units (Chamberlin). With the development pattern associated with this bracket of intensity, there would be a reduction in employment and residential population growth. Also, there would be minimal disturbance from transportation demand during peak commuting periods. This scenario would also limit economic resources for long-term self-sustainment relative to the other scenarios. In any event, if Fort Monroe is converted into a recreational tourism destination, then there would be much lower traffic demand. For such a scenario, there would be substantially lower employment and residential populations than are now on site.

Lower Bracket, Indirect. Minor long-term adverse effects would be expected in the vicinity of Fort Monroe. This reuse scenario will create minor increases in economic growth in the region including the potential for 896 new jobs, which could generate additional residential and commercial traffic beyond the levels directly associated with Fort Monroe redevelopment. Under a tourism destination scenario, the traffic impacts, while minimal, would occur during non-commuter peaks.

Middle Bracket, Direct. Short- and long-term minor to significant adverse impacts to roadways are expected both on and in the vicinity of Fort Monroe. Residential unit density metrics and non-residential square footage development metrics from Table 3.3-3 are key input parameters for simulating vehicular trips and traffic generation. Traffic would more than double with the Middle Bracket scenario and two intersections would degrade to the generally unacceptable LOS F, with one intersection degrading to LOS E within the City of Hampton. This scenario would be commensurate with reasonable long-term and successful execution of the Reuse Plan. The Middle Bracket scenario for Fort Monroe would lead to a largely unavoidable increase in traffic of 24,040 ADT, or approximately 3.3 times the existing traffic, as a result of increased employment and residential population growth relative to baseline conditions. It is anticipated with this scenario that a large amount of office parcels will be reverted to other land uses (residential and commercial), leaving approximately 350,000 SF of office land use. Additionally, there will be approximately 200,000 SF of new commercial buildings with approximately 10,000 SF of lodging parcels currently existing today. The remaining approximate 440,000 SF will be in the form of existing and proposed commercial land use. The Reuse Plan provides the possibility for large tenants such as university headquarters and training facilities on Fort Monroe; however, such developments may be encouraged by an “extensive recruitment plan” and would have to comply with the various requirements for the five management zones in the PA.

Operational impacts to the external local street intersections generated by traffic associated with Middle Bracket development are illustrated in Table 4.11-3.

With the additional traffic generated by the reuse development at Fort Monroe, three intersections would experience significant decreases in LOS under the existing local street network; Mallory Street/I-64 Westbound ramps, Mallory Street/Mellen Street, and Woodland Road/I-64 Westbound ramps. These decreases in LOS are a result of roadway capacity deficiencies, (such as shared lanes, inadequate storage lengths, and poor signal timing) which result in moderate to severe queuing. Based on the location of these three

intersections, poor LOS has the potential to impact both local street and interstate operation when the queuing becomes excessive. Heavy delays at the three intersections are expected, ranging from 7-15 minutes per vehicle. The Mallory Street and I-64 Westbound ramp intersection westbound approach is projected to experience average delays of 7 and 4 minutes per vehicle during evening and Saturday peak hours, respectively. The Mallory Street and Mellen Street intersection northbound approach is expected to average 15 and 7 minute delays per vehicle during the evening and Saturday peak hours, respectively. The Woodland Road and I-64 westbound ramp intersection will pose delays per vehicle of approximately 1 minute during the evening peak hours.

Table 4.11-3 LOS for Intersections in the Vicinity of Fort Monroe – Middle Bracket (Existing Roadway Network)

Intersection	2031 Without Fort Monroe Redevelopment (No Action Alternative)			2031 Redevelopment of Fort Monroe		
	AM	PM	SAT	AM	PM	SAT
Mallory Street and I-64 Eastbound Ramps	B	C	B	C	C	C
Mallory Street and I-64 Westbound Ramps	C	D	B	C	**F**	**F**
Mallory Street and Mellen Street	A	C	A	B	**F**	**F**
Mallory Street and County Street	A	B	A	A	B	A
Mallory Street and Mercury Boulevard	C	C	B	C	C	C
Mallory Street and Atlantic Avenue[1]	B	B	B	B	C	D
Woodland Road and County Street	A	A	A	A	A	A
Woodland Road and I-64 Westbound Ramps	B	D	B	C	**E**	C
Woodland Road and I-64 Eastbound Ramps	D	D	C	D	D	C

[1] – Denotes unsignalized LOS at Atlantic Avenue, along the worst approach (northbound).

Roadways and signal timing were evaluated to address the projected decrease in LOS and it was determined that with proposed infrastructure and signal timing improvements, each of the three intersections with poor operations are able to achieve an acceptable LOS, as illustrated in Table 4.11-4.

Table 4.11-4 LOS for Intersections in the Vicinity of Fort Monroe – Middle Bracket (With Improvements)

Intersection	2031 Redevelopment with the Existing Local Street Network *(from Table 4.11-3)*			2031 Redevelopment with Mitigation to Improve Traffic Operations		
	AM	PM	SAT	AM	PM	SAT
Mallory Street and I-64 Eastbound Ramps	C	C	C	B	C	C
Mallory Street and I-64 Westbound Ramps	C	F	F	A	C	C
Mallory Street and Mellen Street	B	F	F	B	C	C
Mallory Street and County Street	A	B	A	A	B	A
Mallory Street and Mercury Boulevard	C	C	C	C	C	C
Mallory Street and Atlantic Avenue[1]	B	C	D	B	C	D
Woodland Road and County Street	A	A	A	A	A	A
Woodland Road and I-64 Westbound Ramps	C	E	C	C	D	C
Woodland Road and I-64 Eastbound Ramps	D	D	C	C	D	C

[1] – Denotes unsignalized LOS at Atlantic Avenue, along the worst approach (northbound).
LOS represented in green indicates that proposed geometry improvements were needed to provide acceptable LOS.

The identified potential mitigations are as follows:

- Mallory Street from the I-64 interchange to Mercury Boulevard – Widening to four-lanes from the I-64 interchange to Mercury Boulevard to accommodate dual northbound left-turn lanes at Mellen Street;

- Mallory Street/I-64 westbound ramp intersection – Addition of an exclusive southbound left-turn lane and an exclusive westbound right-turn lane;

- Woodland Road/I-64 westbound ramp intersection – Widening of the existing one lane ramp to accommodate dual left-turn lanes and one right-turn lane;

- Settlers Landing Road/I-64 eastbound ramp intersection - Restriping the southbound approach for two left-turn lanes, one thru lane, and a shared thru/right-turn lane. This improvement does not improve operations to the overall intersection; however it is a precautionary mitigation to prevent potential excessive queuing and impacts to I-64.

With these infrastructure and signal timing mitigations, Middle Bracket scenario forecasts can achieve acceptable LOS within the study area, and furthermore does not create any operational impacts on I-64 through travel lanes.

Middle Bracket, Indirect. Moderate to significant long-term adverse effects would be expected in the vicinity of Fort Monroe. This reuse scenario will create minor increases in economic growth in the region including the potential for 2,546 new jobs, which could generate additional residential and commercial traffic beyond the levels directly associated with Fort Monroe redevelopment.

Upper Bracket, Direct. The Upper Bracket scenario would be slightly more intense than the reuse proposed in the Reuse Plan, but still within a Middle Bracket scenario of reuse (FAR of less than 0.3 when combining existing structures, new office/retail/commercial structures, and new residential development). Residential unit density metrics and non-residential square footage development metrics from Table 3.3-3 are key input parameters for simulating vehicular trips and traffic generation. The Upper Bracket scenario for Fort Monroe would lead to a largely unavoidable increase in traffic of 29,640 ADT, or approximately 3.8 times the baseline condition as a result of increased employment and residential population growth. Given the limitations outlined in the Reuse Plan, the difference in potential traffic impacts between the Middle and Upper Bracket scenarios are minimal. Based on the additional trips associated with Upper Bracket scenario, as compared to the Middle Bracket scenario local street traffic will not impact traffic operations along I-64 and it is expected that operations at each of the study intersections would not substantially differ. However, similar long-term effects to the transportation network would be expected, and the similar improvements identified for the Middle Bracket scenario could serve as mitigations for the Upper Bracket scenario as well. All mitigation measures (that include operational and roadway capacity improvements) identified for the Middle Bracket scenario to reduce transportation effects are also identified for the Upper Bracket scenario.

Upper Bracket, Indirect. Moderate to significant long-term effects would be expected in the vicinity of Fort Monroe. This reuse scenario would create minor economic growth in the region, including the potential for 3,566 new jobs, which could generate additional residential and commercial traffic beyond the levels directly associated with Fort Monroe redevelopment.

4.12 UTILITIES

4.12.1 Affected Environment

4.12.1.1 Potable Water Supply

Water is supplied to Fort Monroe by the NNWW in Newport News (Fort Monroe Public Water System ID #3650150). Water sampling is conducted regularly by Fort Monroe and NNWW and analyzed by an outside laboratory to ensure standards of water quality are maintained.

Water to the installation is pumped through a 10-inch supply line that crosses Mill Creek via Mugler Bridge and a 14-inch water line located at the entrance along Mercury Boulevard. The water distribution system at Fort Monroe, including primary mains and service connections, totals approximately 96,000 linear feet (LF) of pipe. The existing primary system consists of 14-, 12-, 10-, 8-, and 6-inch mains looped and cross-connected throughout the installation. Most all mains are cast iron, although some polyvinyl chloride (PVC) pipe has been laid in recent years. All 4-inch mains have been closed, with the exception of a 4-inch cast-iron main running along Fenwick Road towards Dog Beach.

Water storage facilities at Fort Monroe consist of one 300,000-gallon elevated tank, which is in good overall condition and was out of service for quite some time. A field evaluation was conducted in August, 2004. Per the finding of the field evaluation and a request from the VDH, the Army was required to make repairs and perform maintenance on the tank in order for it to become operational. Improvements have included relining of the interior of the tank and replacement of portions of the steps. Other repairs have included repainting the tank as well as installing a booster pump. These improvements were completed and the tank was returned to service as of March 2009.

Samples of drinking water are collected at locations on Fort Monroe every 3 years as specified by VDH. The most recent testing was conducted in 2009. None of the samples collected exceeded regulatory thresholds.

The bulk of the water on the installation is for normal potable uses. A breakdown of waters uses is as follows: housing 49 percent; commercial/institutional 25 percent; irrigation 17 percent; industrial 2 percent; leaks, losses, and unaccounted-for water 7 percent.

There is no water use permit or formal agreement between the installation and NNWW. However, a waterworks operation permit issued by VDH, Office of Drinking Water, exists for the operation of a Class V Community Waterworks. NNWW has the capacity to supply between 3,000 and 5,000 gallons per minute to Fort Monroe. Capacity is not a limiting factor, but water pressure is a potential limiting factor for additional development. Overall, the water distribution infrastructure is in fair-to-good condition. The average age of the distribution system is about 32 years, although there are brand-new sections as well as sections installed prior to 1946. The long-term maintenance of Fort Monroe's distribution system was privatized in 2005, when a contract was awarded to American States Utility

Services, now known as Old Dominion Utility Services. Improvements to the system, including the installation of a booster pump at the water tower, have improved water pressure and increased fire fighting capabilities.

4.12.1.2 Wastewater System

Fort Monroe operates under Industrial Waste Water Discharge Permit #0053 with Hampton Roads Sanitation District (HRSD). Fort Monroe received the HRSD Diamond Award for 10 years of perfect compliance in April 2010. Sewage at Fort Monroe is collected through a sanitary sewage system consisting of main collection sewers (both gravity and force mains), service connection sewers, and 14 sanitary sewage stations (4 lift stations and 10 ejector pump stations). All Fort Monroe sanitary sewage is pumped from the Final Pumping Station (Building 180) through a 16-inch force main to its connection with the HRSD. A wastewater treatment plant (WWTP) was constructed near Mill Creek between 1933 and 1937 to eliminate the possibility of pollution entering the Chesapeake Bay and surrounding areas and also to provide services for the increased population at Fort Monroe. An addition was built for this WWTP and converted to a machine shop in 1937 (U.S. Army 2006a).

The installation sewer mains and service connections consist of 2-, 4-, 6-, 8-, 10-, and 12-inch gravity and pumped-flow force main lines. Most of the gravity lines are vitrified clay pipe, and most of the force mains are cast-iron pipe. The conditions of the sewer lines vary because they were installed at various times over the last 85 years. During the 1970s, all inadequate segments of the lines were replaced. In 1992, a major renovation project (interior pipe relining) was completed involving all force main lines on the installation. The largest effort was the interior relining of the 16-inch cast-iron force main from the Final Pumping Station to its connection with the HRSD. This final force main line carries all Fort Monroe sanitary sewage from the installation sewage collection system.

Due to excessive amounts of inflow and infiltration (I&I) from stormwater and groundwater, a project was initiated to eliminate Fort Monroe's I&I issues by identifying which areas of the wastewater collection/conveyance system experienced excessive stormwater inflow and/or groundwater infiltration. A comprehensive review of the sewer system was conducted. The review included measurement of the wastewater stream, groundwater measurement, rainfall gauging, smoke testing, and closed-circuit television inspection of approximately 82,000 LF of piping ranging from 2 to 16 inches in diameter.

Based on the results of this survey, a repair plan that included costs and prioritization of projects to complete the repairs was developed. The rehabilitation project involved a variety of techniques based on need, including pipe cleaning; whole pipe replacement; pipe lining; pipe bursting; and manhole, bench, and invert repair/replacement.

The project to execute repairs was identified in the completed I&I study. Repairs were completed by 30 December 2005. This did not include the lines servicing Fort Monroe apartments. In total about 17,000 of the approximate 45,000 LF of gravity-fed sanitary sewer pipe was replaced or refurbished, and some new pipe was added. Additionally,

approximately 190 manholes were addressed, primarily by rehabilitation; however, several manholes were replaced, removed, or added.

An emergency outfall line into the Chesapeake Bay, in the vicinity of Battery Parrott, was used as a safety outlet for major emergencies that may endanger life and health, such as a significant sewage system blockage or other system malfunction. Chlorine equipment was located at the Final Pumping Station for purposes of adding chlorine to the sewage prior to dumping it into the bay. The last usage of this outfall was during the spring of 1998. The outfall pipe and associated appurtenances were permanently removed in the spring of 2004 (U.S. Army 2006a).

Only the Final Pumping Station (Building 180) is equipped with a stationary emergency generator for use in the event of electrical power failure. However, additional mobile emergency stand-by generators are available at the DPW and are deployed to critical pump/lift stations during power outages.

4.12.1.3 Storm water System

Fort Monroe includes approximately 51,700 LF of storm sewer piping and associated drop inlets. Fort Monroe includes several designed stormwater BMPs (i.e., detention, retention, and/or infiltration) areas. Facility runoff is transferred through the stormwater conveyance system and discharged from approximately 45 outfalls directly into the Moat, the Chesapeake Bay, Mill Creek, and Hampton Roads Harbor. The constructed portion of the Fort Monroe storm drainage system consists of individual sections of pipe that are constructed primarily of reinforced concrete pipe and corrugated metal pipe and range in size from 6 to 30 inches in diameter.

Fort Monroe comprises generally low lying areas and therefore experiences flooding from time to time. Since the drainage system on Fort Monroe is tidally influenced, storm surges from the Chesapeake Bay and Mill Creek often result in flooding problems caused by water back-flowing through storm drain outfalls throughout the base. Projects have been undertaken to increase capacities of the drainage systems and minimize backflows and associated impacts. One such project included the installation of a sluice gate system on one of the main drainage outfalls into Mill Creek.

In May 2005, USACE conducted a flood evaluation and protection study to evaluate flooding and develop measures to reduce future flooding from strong storms. In 2007, Fort Monroe received partial funding for construction of some of the improvements recommended in the USACE study. The study recommended installation of backflow prevention valves on the numerous storm sewer outfalls as a means of controlling flooding. The Army has installed these valves on approximately 16 of the 45 storm sewers that discharge into the Chesapeake Bay and Mill Creek as well as inflow and outfall pipes located at the moat.

Fort Monroe is covered by a VSMP Small Municipal Separate Storm Sewer System (MS4) permit (No. VAR040042) issued 9 July 2008 by the VDCR. The permit includes a

management strategy and stormwater improvement goals to be achieved during the permit term.

4.12.1.4 Energy Sources

Electricity. Fort Monroe receives commercial power from Dominion Virginia Power (DVP) through a 22 Kilovolt (KV) feeder to the installation's main substation. Fort Monroe's secondary source of electricity is from 13 diesel-powered standby emergency generators, 1 natural gas-powered emergency generator and 6 portable diesel-powered emergency generators.

The electrical distribution system was privatized in 2005 and is now owned and operated entirely by DVP. A multiphased major construction project was undertaken from 1992 through 1998 to replace all of the existing 4.2 KV overhead distribution lines with a new 3.2 KV underground electrical distribution system. DVP provides separate commercial power to the Wherry Family Housing area and the Chamberlin.

In the aftermath of Hurricane Isabel, the electrical distribution system was among the many infrastructure components found to be damaged. DVP, which is the owner and operator of the system up to and including the usage meters, repaired and upgraded the system to meet their standards, and the Army's standards and requirements have been met as well. The installation's underground distribution lines and service connections are now in good condition, readily accessible throughout the installation, and considered adequate for future expansion (U.S. Army 2007a).

Natural Gas. Natural gas for Fort Monroe is supplied by Virginia Natural Gas (VNG) Company. The natural gas is supplied through a VNG-owned four-inch main (across Mill Creek via Mugler Bridge) and an eight-inch main (across Mill Creek via Mercury Boulevard Bridge, U.S. Route 258). These two supply lines terminate in an on-post gas metering station located in the vicinity of the main entrance to the installation.

The natural gas distribution system at Fort Monroe, including primary mains and service connections, consists of approximately 10.5 miles of pipe. Most of the existing distribution system was replaced during a four-phase replacement project from 1976 to 1978. The system has been updated continually as needed. The gas system is owned, operated, and maintained by the Army.

Natural gas at Fort Monroe is used in the family housing developments and to heat domestic hot water in buildings throughout the installation. The heating plants at Building 6, which serves several buildings inside the moat, and Building 134, which serves several buildings in the Command Area, are dual fuel systems. Building 134 has a separate gas meter installed. Most other boilers and furnaces have been converted to natural gas-burning systems. Only six systems, including St. Mary Star of the Sea Church, are exclusively oil-burning systems.

The distribution system consists of 6-, 4-, 3-, 2-, and 1 ½-inch mains throughout the installation. Most all mains are coated and wrapped black metal pipes, but a number of

PVC lines have been added over the years. Service lines are generally 1-, ¾-, and ½-inch pipes of similar composition.

The largest natural gas distribution main is a single 6-inch main approximately 2,700 feet long extending from the gas metering station to a point in the vicinity of the Main PX (Building 210).

During the replacement of the natural gas system during 1976–1978, almost all (approximately 40,000 LF) of the then-existing distribution system and service connections were closed. The lines were purged of gas, filled with water, and closed in place. The only lines that were not closed were the 6-inch main, a 3-inch main entering the inner moat area, and the mains and connections to the Wherry family housing area.

Fort Monroe has experienced pressure problems in the past since the system's overall operating pressure is relatively low, in the range of 5 to 7 pounds per square inch. A recent leak study conducted by B. Knight Natural Gas Service identified 12 leaks. Each has been repaired and the system is now in fair-to-good condition.

Fuel. There are a number of heating oil tanks, both above ground and underground, located on Fort Monroe. Additional information on tanks is provided in Section 4.13.

4.12.1.5 Communications

Communications networks are located in an underground system and provide state-of-the-art CAT6 communications technology to various buildings located on Fort Monroe. The installation telephone system is maintained and operated under the Army Telecommunications Services contract. Verizon Wireless provides all services for communications on the installation. Most of the residences on Fort Monroe are provided with cable television service through Cox Communications.

4.12.1.6 Solid Waste

Fort Monroe has an Integrated Solid Waste Management Plan, which guides solid waste and recycling decisions on Post, as well as tracks program history and solid waste data. The plan is updated annually. The current plan focuses on Fort Monroe's new mission and environmental issues in light of BRAC, such as how to properly manage BRAC related wastes.

Solid waste on the installation is collected and removed from post by Waste Industries. The contractor then transports the waste to either the Big Bethel Landfill or to the Hampton Refuse-Fired Steam Generating Plant for disposal. Approximately 50 percent of all solid waste goes to the steam plant, which converts waste into energy through incineration. There is one storage accumulation facility located in Building 81 managed by the DPW for storing wastes requiring special handling such as latex paint and petroleum wastes (see also Section 4.13.1.2 for a discussion of storage and handling of hazardous and toxic substances).

Fort Monroe does not currently possess any solid waste permits. The installation has an active recycling program and a pollution prevention program. Combustible waste is taken to the refuse-fired steam generator facility at the NASA Langley Research Center. Noncombustible and residual ash is sent off-site to a local landfill. Medical wastes from the medical and dental facilities on the installation are picked up bi-weekly by a private contractor for incineration.

Approximately 50 dumpsters are needed throughout Fort Monroe ranging in size from 4 to 40 cubic yards. This number fluctuates on a seasonal basis. On average, 120 tons of refuse is disposed of each month, equating to about 1440 tpy. This quantity includes an average 214 tpy produced by the military family housing units.

Fort Monroe runs the DoD/Army Qualified Recycling Program that includes a curbside collection program for residents. The municipality's recycling program has no presence on Fort Monroe. The recycling center is also located on the installation at Building 81. Recycled materials at this facility include cardboard, magazines, white paper, mixed paper, scrap metal, non-ferrous metals, aluminum cans, toner cartridges, and telephone books. Waste Industries conduct curbside pickup of recyclables in the family housing areas and provide the installation with appropriate information for tracking purposes. Recyclables from the administrative and industrial areas are collected, processed, and transported for marketing by the on-post recycling center. The 168 military family housing units produce on average about 5.29 tons of recyclables per month.

4.12.2 Consequences

Fort Monroe's utilities infrastructure is in good condition. This is largely due to $90 million in infrastructure investments for repairs after damage caused by Hurricane Isabel in 2003. This funding allowed for replacement and upgrades to the water distribution system and components of the storm and sanitary sewer system. Although infrastructure is reported to be in generally good condition, long-term redevelopment of Fort Monroe will require some upgrades to existing systems as well as extensions to redevelopment areas for water, sewer, and storm drainage infrastructure.

4.12.2.1 Early Transfer Disposal Alternative

***Direct*.** Minor long-term adverse and beneficial effects to utilities would be expected at Fort Monroe. In the short-term, tenants on Fort Monroe consume most of the utilities. Under the early transfer alternative, the ownership of the property would change, but the activities and utility demand in the short-term would not change appreciably, resulting in no adverse effects.

In the long-term, minor beneficial and adverse effects to the utility systems may occur. Minor beneficial effects will occur as private ownership and market forces enable the needed upgrades to utility systems, including upgrading sewer lines, water infrastructure, and stormwater systems. On the other hand, adverse effects may occur if market forces and redevelopment outpace to some degree infrastructure upgrades that are needed.

Impacts to utilities were evaluated based on an analysis of increased usage at Fort Monroe by employees, residents, and tourists as shown in Table 3.3-3. As stated in the Reuse Plan, infrastructure is generally in good condition but will require some upgrading. The Fort Monroe Long Range Plan (R&K Engineering 2002) evaluated available assets at Fort Monroe and determined that the water, sewer and electrical systems were adequate and could support expansion with the gas and communications systems requiring expansion to support the increased mission. Although certain systems could benefit from modernization and various upgrades, the measured carrying capacities of these systems are adequate to support the initial short-term reuse of existing facilities.

***Indirect*.** No effects would be expected.

4.12.2.2 Traditional Disposal Alternative

***Direct*.** Minor long-term adverse and beneficial effects to utilities would be expected at Fort Monroe under the traditional disposal alternative. Effects would be similar to those described under the early transfer disposal alternative.

***Indirect*.** No effects would be expected.

4.12.2.3 Caretaker Status Alternative

Direct. Minor long-term adverse effects would be expected on Fort Monroe. Caretaker status would result in decreased demands on installation infrastructure, which could extend the life of some utility systems. However, some utility systems are designed to be continually used over the life of the system, and suspending use of the system may do more harm than good. Reduced use and maintenance of utility systems could result in gradual deterioration over time, resulting in a long-term adverse effect.

Indirect. No effects would be expected.

4.12.2.4 No Action Alternative

No direct or indirect effects would be expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure and realignment; thus, no effects would occur relative to continuation of the Army's mission and conditions in November 2005.

4.12.2.5 Intensity-Based Probable Use Scenario

Lower Bracket, Direct. In the long-term, minor beneficial effects to the utility systems would be expected to occur, as private ownership and market forces enable upgrades to utility systems, including upgrading sewer lines, water infrastructure, and stormwater systems. The Lower Bracket scenario would be commensurate with current baseline conditions with the addition of a tourism component. As such, worker and residential populations would be lower, but with higher lodging and associated amenity requirements. Overall, utility systems should be able to accommodate the service requirements of the Lower Bracket scenario without resulting in adverse effects.

Lower Bracket, Indirect. No effects would be expected.

Middle Bracket, Direct. Minor long-term beneficial and adverse effects to the utility systems would be expected to occur. As estimated in the master plan (R&K Engineering 2002) and based on employee, residential and tourist projections shown in Table 3.3-3, no impacts would be expected under the Middle Bracket scenario to water, sewer and electrical system. For the Middle Bracket scenario, estimated population increases (5,000 total) are still below the carrying capacity of these systems (6,720 total minimum), even with the minor increase in associated water demand and waste water generation. Minor adverse impacts would be expected to natural gas and communications infrastructure since the current configuration of these systems (carrying capacity of 3,300 and 3,500 personnel respectively) cannot meet the proposed increased needs and would therefore require system upgrade and enhancement. Minor beneficial effects would occur as private ownership and market forces enable upgrades to utility systems, including upgrading sewer lines, water infrastructure, and stormwater systems. On the other hand, minor adverse effects may occur if market forces and redevelopment outpace to some degree infrastructure upgrades that are needed. Proposed reuse would result in a large increase in employees, residents, and facilities that would result in adverse impacts to utility systems, as further discussed below. This would result in increased demands on the installation's existing utilities infrastructure and require development and addition of new infrastructure to accommodate new facilities and users. Although infrastructure is reported to be in generally good condition, proposed development of Fort Monroe will require some upgrades to existing systems as well as extensions to redevelopment areas, primarily for water, sewer, and storm drainage infrastructure. In addition, Fort Monroe's infrastructure systems are predominately owned by the Army. Upon the Army leaving the installation, ownership of most of the infrastructure, with the exception of some phone and cable communications infrastructure that is privately owned, will be transferred to the Commonwealth of Virginia. These systems are large, old, and essential, as they provide the backbone for the operations of Fort Monroe. The operation and maintenance of these systems once the Army leaves is critical to ensure uninterrupted service in order to facilitate a smooth transition for reuse. Future ownership, operation, and maintenance of this infrastructure could present significant challenges and possibly costs, as it is understood that most of these systems appear to be under capacity for new development and do not meet local municipal, regional, or state standards (FMFADA 2008a).

Increasing the residential population on Fort Monroe (40 percent increase) above current levels would proportionately increase the demand for potable water from NNWW and treatment of water by HRSD. However, this change on Fort Monroe represents only a one percent increase in the population of the City of Hampton serviced by the HRSD, phased over a 20 year period. This very small net change in service requirements is well within the capacity of the HRSD to address the water resource needs of Fort Monroe, without effecting plant discharges or water capacity issues. Therefore, there are no adverse effects to water resources with respect to wastewater discharges or water consumption and availability. Further assessment of water and sewer utilities would occur during redevelopment, and long-term minor benefits may be realized by the installation and upgrading of new utilities.

Middle Bracket, Indirect. No indirect effects to utility systems would be expected.

Upper Bracket, Direct. Minor long-term beneficial and adverse effects would be expected. Effects will be similar to those outlined above for the Middle Bracket scenario, but slightly higher in intensity, given the small increase in residential development and population. As estimated in the master plan (R&K Engineering 2002) and based on employee, residential, and tourist projections shown in Table 3.3-3, no impacts would be expected under the Upper Bracket scenario to the water, sewer, and electrical systems since population projections (6,300 total) are still below the carry capacity of all systems (6,720 total minimum). Increases in on-site population would result in only a minor increase in associated water demand and wastewater generation. Minor adverse impacts would be expected to natural gas and communications infrastructure since the current configuration of these systems (carrying capacity of 3,300 and 3,500 personnel respectively) cannot meet the proposed increased needs and would therefore require system upgrade and enhancement.

Upper Bracket, Indirect. No indirect effects to utility systems would be expected. Economic growth spawned from redevelopment at Fort Monroe could generate additional infrastructure and utility demands for the region, but the long-term change and capacity of the regional systems are expected to be sufficient to address growing needs.

4.13 HAZARDOUS AND TOXIC SUBSTANCES

4.13.1 Affected Environment

Information in the following section is largely based on information contained in the ECP prepared for Fort Monroe, November 2006 (U.S. Army 2006a).

4.13.1.1 CERFA Designation

The ECP identified 18 study sections for Fort Monroe in accordance with the criteria described in the ASTM 5746-98 Standard Classification of ECP Area Types for Defense BRAC Facilities, the CERFA – Pub. L. 102-426 guidance. CERFA directs federal agencies to evaluate all property on which federal government operations will be terminated to identify uncontaminated parcels. CERCLA allows the transfer of remediated parcels when the successful operation of an approved remedy has been demonstrated. Of the approximately 565 acres, 488 acres are designated as Categories 1, 2, 3, or 4; the remaining 77 acres are Categories 5, 6, or 7.

Areas that are designated as Category 1, 2, 3, or 4 are considered suitable for transfer or lease, subject to the applicable qualifiers. Areas that are designated as Category 5, 6, or 7 may not be suitable for transfer by deed under traditional disposal mechanisms, but may be eligible for early transfer under CERCLA 120(h)(3)(C). Table 4.13-1 shows the breakdown of acreage and category definitions. Although the designations are per the CERFA report and the 2006 ECP as well as discussions with Fort Monroe environmental personnel, the determinations were not agreed to by VDEQ due to perceived data gaps that existed with respect to a comprehensive understanding of contamination installation-wide at Fort Monroe.

As a result of ongoing meetings between VDEQ, FMFADA, and the Army, an installation-wide site investigation was initiated in late 2007 to address known and potential data gaps. As a result, several sites were designated as No Further Action sites, but some sites required additional investigation as identified in Table 4.13-3 and as per the final Site Inspection (SI) completed in December 2008 (U.S. Army 2008b). Additional field investigations were completed in 2009 and will continue in 2010. These categories will be better defined upon completion of these investigations.

4.13.1.2 Storage and Handling Areas

Fort Monroe is a non-National Priorities List installation. It currently operates as a RCRA Large Quantity Generator (LQG) which permits the generation of more than 2,200 pounds of hazardous waste per month. LQGs must properly ship all hazardous wastes off-site for treatment and disposal within 90 days of the accumulation start date. Fort Monroe is authorized to accumulate hazardous wastes in temporary storage sites or Satellite Accumulation Areas (SAA) only. SAAs are set up for specific projects and maintained by the DPW.

There is one 90-day storage accumulation facility located in Building 81 managed by the DPW. The majority of waste is LBP abatement waste and excess chemical products. Universal wastes are also generated at Fort Monroe, which include batteries and

fluorescent lamps (containing mercury) (U.S. Army 2006a). Requirements for managing universal waste differ from hazardous waste.

Table 4.13-1 Fort Monroe CERFA Designations

Category	Definition	Fort Monroe Acreage and Sites[1]
Category 1	Areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.	**470 Acres**
Category 2	Areas where only releases or disposal of petroleum products has occurred.	**17 Acres**
Category 3	Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.	**<1 acre**
Category 4	Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken.	**0 acres**
Category 5	Areas where release, disposal, and/or migration of hazardous substances has occurred and removal or remedial actions are under way, but all required remedial steps have not yet been taken.	**0 acres**
Category 6	Areas where release, disposal, and/or migration of hazardous substances has occurred but required actions have not yet been implemented.	**0 acres**
Category 7	Areas that are not evaluated or require additional evaluation.	**77 acres**

Source: U.S. Army 2006a and discussions with Fort Monroe personnel. Facilities constructed prior to 1985 are assumed to have ACM unless an ACM survey or ACM remediation has been conducted. Facilities constructed prior to 1978 are assumed to contain LBP unless a LBP survey or LBP remediation has been conducted. Parcels were qualified for ACM, LBP, PCBs, and MEC based on information from record reviews, interviews, and visual inspections (ECP 2006).

Total acreage of Fort Monroe: **565 acres**

[1]Estimated acreages based on the 2006 ECP and CERFA report. Designations and acreages are being updated pending the results of further site investigations conducted in 2009 and will continue in 2010. However, as per VDEQ, these designations have not been fully agreed to. A site investigation was initiated to clarify any data gaps and a Draft SI was published in February 2008. Additional investigation work was conducted in 2009 and will continue in 2010.

4.13.1.3 Hazardous Waste Disposal

Fort Monroe does not operate as a hazardous waste transporter or disposal/treatment facility of hazardous waste, and maintains no such permits. Hazardous wastes are transported off-site for disposal by several contracted transporters and disposal/treatment companies using USEPA ID Number VA5210020603 on waste manifests. Medical wastes from the medical and dental facilities on the installation are picked up bi-weekly by a private contractor for incineration.

Two closed landfills are present on-site – the Dog Beach landfill and the Area 200 landfill. They have not been used since the 1960s. Additional information pertaining to these sites can be found in the Installation Action Plan (IAP) (U.S. Army 2006b). Although the IAP lists the landfills as closed, both sites are being further evaluated from both a human health and an ecological perspective.

Fort Monroe manages its own hazardous waste management contracts and does not have a Defense Reutilization and Marketing Office.

4.13.1.4 Site Contamination and Cleanup

Contaminated Sites. The IAP outlines the multiyear restoration program for a facility. It is focused on contamination resulting from past activities. The site investigations are detailed in the IAP (U.S. Army 2006b).

An installation-wide site investigation is being conducted to identify sites requiring further investigation and possible remediation (U.S. Army 2008b). Sites are being investigated under the IRP process which includes CERCLA expanded SI studies. These sites are identified in Table 4.13-2. Furthermore, VDEQ has recommended multi-media sampling of sites in Mill Creek and within the moat area near stormwater drainage pipe outfalls.

Table 4.13-2 IRP Sites Currently Under Investigation

Location	Sites Currently Under Investigation
Historical Village Area	Former Building 76 Tanks ** Former photography building – Building 183 ** Medical and Dental Clinic – Building 82 Buildings in mine wharf area – Buildings 204 / 205 Area
Inner Fort Area	Former photography lab – Building 217 The Moat Area 200 Landfill
North Gate Area	Lumber Storage Site Post Engineer Shops, Asphalt Plant, Oil House Former ordnance machine shop – Building 59 Former Directorate of Engineering and Housing (DEH) compound and fabrication and repair shop – Building 168 Motor pool and shop complex – Building 57 **
Parks and Recreation	Former Fire Training Pit ** Former Rifle Range ** Former East Pistol Range ** Former Skeet Range Former Target Range Dog Beach Landfill
Wherry Quarter	Former Auto Craft Shop Former Wastewater Treatment Plant Former Gas Station **
Source: U.S. Army 2008b ** Closed per VDEQ No Further Action Letter dated 31 March 2010	

Range Inventory and Military Munitions Response Program (MMRP). DoD established the MMRP Environmental Restoration, Army Program and Defense Environmental Restoration Program to address unexploded ordnance, discarded military munitions, and munitions constituents located on current and former military installations where suspected releases occurred prior to 30 September 2002. Operational military ranges, permitted munitions disposal facilities, or operating munitions storage ranges are not MMRP-eligible. The Phase 3 Army Range Inventory was completed at Fort Monroe in December 2003. The inventory identified 13 sites eligible for the MMRP, of which 11 are listed in Table 4.13-3.

Table 4.13-3 MMRP Inventory

Site Designation	Use History	Status/Cleanup
Battery Anderson Battery Ruggles	Completed 1899 Battery Anderson – 2 southern pits, 6 acres Battery Ruggles – 2 northern pits, 3 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Battery Barber Battery Bomford Battery Eustis	Completed 1897-1901 Battery Barber – 3 acres Battery Bomford – 19 acres Battery Eustis – 5 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Battery Church Battery Montgomery	Completed 1901-1904 Battery Church – 3 acres Battery Montgomery – 2 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Battery Derussy	Completed 1901 Battery Derussy – 5 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Battery Irwin Battery Parrott	Completed in 1902 Battery Irwin – 1 acre Battery Parrot – 3 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Building 139	Constructed 1909 0.06 acre MEC removed during 1996 renovation/construction.	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Building 205	Constructed 1910 0.02 acre MEC debris removed from water in 2003.	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Moat	Constructed in 1818 8-foot depth 19 acres MEC removed in 1978.	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Target Range	Used from 1907–1965 Rifle, pistol, and skeet 3 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Target Range TD	Water portion of range fan outside installation boundary. 2 acres	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.
Water Battery	Completed in 1866, removed 1901 1 acre No information on use	Remedial Investigation field work was complete in October 2009. As of the date of this report, an MMRP Risk Assessment and Feasibility Study of Alternatives is being prepared.

Source: U.S. Army 2006a (updated April 2010)

Due to the extended use of Fort Monroe, much of the installation has been developed or utilized at one time or another. Before and during the Civil War, it was known for the first Artillery School of Practice and contained one of the largest arsenals with a storage yard. By WWII, it served as headquarters for an impressive array of batteries containing coastal artillery guns capable of firing a projectile with a maximum range of 15,000 yards. As a result, buried shells and munitions are sometimes encountered on the installation's property during excavations. Routine excavations for construction have at times turned up MEC. Many of the items contain black powder and date to the nineteenth century, although some finds are more recent.

Army Toxic and Hazardous Materials Agency conducted soil, groundwater, surface water, and sediment sampling for munitions associated contamination in 1980. Open areas were surveyed with a magnetometer to search for buried metal objects, but subsurface conditions and the limited technology could not differentiate between miscellaneous metal objects and ordnance-related objects.

In 1995 an Ordnance and Explosive Waste Investigation identified many metallic anomalies across the fort (Parsons 1995). Very few were subsequently identified as munitions. In addition, the 2006 Historical Record Review indicates that there is the potential for MEC to remain at 4 Arsenal Area sites, 13 Fortress Area sites, and 23 Coastal Defense Area sites (Malcolm Pirnie 2006). This estimate was based on various sources of information, including an ordnance removal project performed by Navy explosive ordnance disposal in the moat in 1978.

The Army awarded a RI/FS in 2008 to determine the nature and extent of potential buried munitions at Fort Monroe as well as a course of action after closure. The geophysical and intrusive digging phase of this project were completed by late 2009. Approximately 2,300 metallic anomalies were identified as part of the geophysical investigation. These anomalies were intrusively investigated, and two MEC items were ultimately discovered. The remainder of the anomalies, included 7 pieces of scrap munitions debris and over 1,700 pounds of scrap metal trash. The final report is anticipated to be complete in late 2010.

When the report is completed, a decision will be made as to whether remediation of MEC is necessary. For the protection of human health, land use controls, including dig restrictions must remain in place site-wide until the investigation and, if necessary, remediation of MEC is completed. Dig restrictions and construction support may remain in perpetuity as deed restrictions. The Army will provide necessary land use restrictions and notice of MEC present at Fort Monroe in transfer and conveyance documents. The exact nature of these restrictions will depend on the findings of further investigative work in coordination with VDEQ.

4.13.1.5 Special Hazards

Asbestos. Records indicate that ACM are present at Fort Monroe. All buildings constructed prior to 1987 located on Fort Monroe were inspected for the presence of ACM (Versar 1987, USACE 2003). Additional ACM surveys were conducted by Versar in 2003 on 28

buildings (Versar 2004a) and in 2004 on 27 buildings (Versar 2004b). Additional ACM surveys were conducted as needed for renovation and demolition projects. Although significant ACM surveys, testing, and abatement has occurred at Fort Monroe, not all remaining identified or suspected ACM was required to be abated. Prior to transfer or conveyance, the Army will remove, enclose, or encapsulate any discovered friable ACM posing a risk to human health, or negotiate agreements with the transferee to abate. The Army will provide notice in the transfer and conveyance documents for those buildings that are known or suspected to contain ACM.

Lead and Lead-Based Paint (LBP) Hazards. Fort Monroe has managed all lead hazards in accordance with its Lead Hazard Management Plan (1999), including, but not limited to, informing occupants of the possible or known presence of LBP, testing paint before maintenance projects, incorporating lead abatement into renovation projects, and keeping a mulch cover over the ground along the dripline of residences. Almost every building on Fort Monroe built prior to 1978 contains or contained LBP at some time in its history. However, lead was abated through removal or enclosure in the majority of the quarters during renovations in the late 1990s and early 2000s, and many administrative buildings have been partially or completely abated as well. The DPW maintains a database of lead testing data collected for specific projects, as well as information on what has been abated on specific buildings. The data include analytical results of sampling paint chips, dust, soil, and drinking water. Some of the soil samples have exceeded the residential standards for lead. Army policy is to manage LBP in place unless it poses a hazard. Consistent with the Residential Lead-Based Paint Hazard Reduction Act of 1992 (Pub. L. 102-550), the Army will provide notice in transfer and conveyance documents that buildings containing LBP would be restricted from residential use unless the recipient of the property abates LBP hazards.

Polychlorinated Biphenyls (PCB). All installation-owned electrical transformers at Fort Monroe were removed as part of an underground utility upgrade. The last remaining pole-mounted transformer sampled was removed by DVP in 2002. PCBs may still be contained in light ballasts in the older type fixtures on the property. Older ballasts that are managed by the installation are treated as though they contain PCBs and disposed of in accordance with federal, state, and local requirements as regulated under the TSCA program (U.S. Army 2006a).

Radon. Fort Monroe conducted monitoring of indoor air for radon from 1989 through 1991. All results were less than 4.0 picocuries per liter (pCi/L) of air with the average level less than 0.2 pCi/L. Available records indicate that radon does not pose an environmental concern for the installation (U.S. Army 2006a).

Storage Tanks - Underground (UST) and Aboveground (AST).

Underground Storage Tanks (UST). There are currently five regulated USTs at Fort Monroe. Three of these have a capacity of 6,000 gallons each and are located at the Army and Air Force Exchange Service gas station. Two other tanks contain diesel fuel to power emergency generators at Buildings 92 and 203. Six other tanks, which store heating oil for

buildings and range in capacity from 550 to 10,000 gallons, are not regulated by VDEQ. The Fort Monroe historical database shows that 164 current and former petroleum USTs, ranging in capacity from 500 to 15,000 gallons, have been located on the post. The tanks were used for heating fuel, diesel, and gasoline (U.S. Army 2006a). A detailed list description, and status of all USTs at Fort Monroe (closed, removed, in use) is provided in Appendix H of the ECP (U.S. Army 2006a).

Aboveground Storage Tanks (AST). There are currently 33 active petroleum ASTs ranging from 250 to 30,000 gallons capacity, including six portable tanks that are integral parts of emergency power generators. Five of these tanks are regulated by VDEQ because of their size and contents. Most of the current tanks are used to store fuel for emergency generators. Historically, they were used to store heating fuel, diesel, gasoline, liquid propane, and used oil. The historical database shows 59 current and former ASTs. There are additional ASTs that contain products other than petroleum (U.S. Army 2006a). A detailed list, description, and status of all ASTs at Fort Monroe (closed, removed, in use) is provided in Appendix H of the ECP (U.S. Army 2006a).

Pesticides and Herbicides. Pesticide records were kept dating back to 1991, with one record for 1987. Spray tank mixing and rinse-down of spray rigs was performed on unprotected sandy soil outside Building 178. The pest control facility has relocated to Building 81, and Building 178 was deconstructed in 2002. Chlorinated pesticides and herbicides were used and stored at Building 178, but sampling conducted in 1990 showed that residues in the vicinity of the building did not pose a risk to human health or the environment (U.S. Army 2006a). The Pesticide Risk Management Study (September 1990) concluded that residues detected in Building 81 were not a hazard. Residues inside the former DEH yard in the immediate vicinity of a former pesticide storage shed were elevated. A bioremediation system was implemented in 1993 for the former DEH compound. No final sample results were available. The former DEH site is still under investigation as part of the IRP.

Medical and Biohazardous Waste. There are medical and dental facilities on Fort Monroe located in Building 82. The Craven Army Medical Clinic generates approximately 1,800 pounds of medical waste per year. The waste is picked up bi-weekly by a private contractor for incineration.

Radionuclides. No radiological materials were identified on the property during the site reconnaissance. Low-level, sealed source radiological materials would have been used in the medical and dental clinics for X-ray purposes. There is no evidence of any release of radiological materials at the installation.

Spills. Fort Monroe has a Spill Prevention Control and Countermeasures plan in place. Training for spill response is given to facility personnel on an annual basis. Used spill clean-up materials are packaged and transported off-site for treatment and/or disposal in accordance with federal, state and local regulations. No treatment takes place at Fort Monroe.

4.13.1.6 Ongoing Remedial Actions

The Army is characterizing the existing environmental conditions at Fort Monroe. Fort Monroe was divided into parcels that were evaluated and assigned a score of 1 through 7 based on standard ECP area types (see Table 4.13-1). Category 1 is assigned to an area where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). Categories 1 through 4 are considered suitable for transfer and reuse.

Under the Traditional Disposal Alternative, CERCLA 120(h) requires that, prior to transfer, necessary remedial actions be completed or in place and proven to be operating properly and successfully. Under the Early Transfer Disposal Alternative, CERCLA 120(h)(3)(C) allows property to be transferred before all necessary remedial actions have been completed (for Categories 5, 6, and 7). The CERCLA covenant deferral request for this alternative must be approved by the state governor. In the case of Fort Monroe, this applies only to the non-reverting property.

As shown in Table 4.13-2, site investigations have resulted in no further action decisions by VDEQ on several sites. Site investigations at remaining locations have not yet reached the remedial action phase.

4.13.2 Consequences

The reuse of the property must be consistent with the remedial constraints, land use restrictions, and the protection of human health and the environment. The new owner may agree to perform all environmental remediation and monitoring, waste management, and environmental compliance activities required. The Army will provide notification on the storage of hazardous substances in quantities greater than or equal to 1,000 kilograms or the hazardous substance's CERCLA reportable quantity (whichever is greater) for one year or more. If additional remedial actions are needed beyond the transfer date, the government is responsible for only those that are attributable to activities of the federal government.

4.13.2.1 Early Transfer Disposal Alternative

Direct. Minor long-term adverse effects might occur. Following disposal, redevelopment of Fort Monroe could lead to construction (up to 1,500 additional residential units, up to 100 acres of excavation over the 20 year development period), limited demolition, renovation, and expanded commercial and residential use (up to 1,500 additional residential units and 1.2 million SF). These activities could increase the potential for use, storage, transport, and generation of hazardous substances and hazardous wastes, as well as the potential for accidental release and minor spills. In any event, hazardous waste generation and disposal are carefully regulated under state (Virginia Hazardous Waste Management Regulations, and ACM and LBP regulations 9 VAC 20-80-640 and 9 VAC 20-60-261, respectively) and federal programs, thereby reducing the effect to the environment. Renovation and limited demolition of older structures may also generate wastes containing ACM and LBP. Demolition activities that include ACM and LBP must adhere to Virginia regulations 9 VAC 20-80-640 and 9 VAC 20-60-261, in addition to federal regulations.

No effects would be expected from early transfer disposal relative to ongoing remediation programs, as remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies regardless of whether the property is transferred or not. Necessary land use controls will be put in place to ensure protection of human health and the environment, and controls will be placed on parcels that are still under investigation and cleanup.

Indirect. Minor long-term adverse effects might occur. Over the long-term, depending on activities of future tenants, minor quantities of hazardous materials, such as cleaning products, fuels, and pesticides, would be required during the use phase of buildings and structures on the property. These materials and wastes would still be expected to have limited impact to the site due to the likely limited quantities and use of these chemicals. The management of the use of these materials would be subject to federal, state, and local regulation.

4.13.2.2 Traditional Disposal Alternative

Direct. Minor long-term adverse effects might occur following disposal as a result of redevelopment and demolition activities. No effects would be expected relative to ongoing remediation programs. This alternative is similar to the early transfer disposal alternative and would require the continuance of ongoing investigative and, if required, remedial and monitoring actions. However, because of the additional time necessary for transfer, some additional monitoring and closure will be completed. The long-term remedies must continue to be monitored and shown to be operating properly and successfully. Until that determination is made and agreed to by all parties, the property could not be transferred.

Indirect. Minor long-term adverse effects might occur. Effects would be similar to those presented under the early transfer alternative; however, realization of impacts would occur at a later date.

4.13.2.3 Caretaker Status Alternative

Direct. Minor beneficial effects would occur. Investigative and remedial efforts would continue to occur during caretaker status. Storage and use of hazardous materials would decline to a minimal level. The decreased storage and use of hazardous substances would result in long-term beneficial effects relative to status quo operating conditions.

Indirect. Minor adverse effects would be expected. ACMs, LBP, and PCB fixtures are still located in structures. Renovations that would have otherwise taken place may not be initiated for facilities, resulting in long-term adverse effects relative to status quo operating conditions.

4.13.2.4 No Action Alternative

No direct or indirect effects would be expected. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure and realignment, including implementation of ongoing remedial programs required under CERCLA and RCRA.

4.13.2.5 Intensity-Based Probable Use Scenario

***Lower Bracket, Direct*.** Minor short-term adverse and long-term minor beneficial effects would be expected. Limited construction, demolition, and renovation activities may increase the potential for short-term use, storage, transport, and generation of hazardous substances and hazardous wastes. Increased renovation and demolition of buildings containing ACM, LBP, or other hazardous substances may cause these substances to be generated as a result of redevelopment. Under all circumstances, hazardous waste generation and disposal are carefully regulated under state (e.g., 9 VAC 20-80-640, 9 VAC 20-60-261) and federal programs, thereby reducing effects to the environment. In addition, implementation of a spill prevention program would minimize potential effects. Remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies. Necessary land use restrictions will be put in place to ensure protection of human health and the environment as remediation efforts continue in accordance with regulatory agencies.

***Lower Bracket, Indirect*.** Minor beneficial effects would be expected. Over the long-term, site operations would be below current baseline conditions, thereby resulting in a net decrease in the use of hazardous materials, such as cleaning products, fuels, and pesticides.

***Middle Bracket, Direct*.** Long-term minor adverse effects would be expected. Construction (up to 1,300 additional residential unity, 1.0 million SF of commercial space, up to 85 acres of excavation), limited demolition, and renovation activities may increase the potential for use, storage, transport, and generation of hazardous substances and hazardous wastes relative to baseline conditions. Increased renovation and demolition of buildings containing ACM, LBP, or other hazardous substances may cause these substances to be generated as a result of redevelopment. In addition, implementation of a spill prevention program would minimize potential effects. Remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies. Necessary land use restrictions will be put in place to ensure protection of human health and the environment as remediation efforts continue in accordance with regulatory agencies.

***Middle Bracket, Indirect*.** Over the long-term, depending on activities of future tenants, minor quantities of hazardous materials, such as cleaning products, fuels, and pesticides, would be required during the use phase of buildings and structures on the property. These materials and wastes would still be expected to have limited impact to the site due to the likely limited quantities and use of these chemicals. The management of the use of these materials would be subject to federal, state, and local regulation.

***Upper Bracket, Direct*.** Long-term minor adverse effects would be expected. Effects would be similar to those discussed under the Middle Bracket scenario. Construction (up to 1,500 additional residential units, 1.2 million SF of commercial space, up to 100 acres of excavation), limited demolition, and renovation activities may increase the potential for use, storage, transport, and generation of hazardous substances and hazardous wastes relative to baseline conditions. Increased renovation and demolition of buildings containing

ACM, LBP, or other hazardous substances may cause these substances to be generated as a result of redevelopment. Demolition activities that include ACM and LBP must adhere to Virginia regulations 9 VAC 20-80-640, 9 VAC 20-60-261, and federal regulations, thereby limiting adverse effects. Remediation of hazardous substances would continue in accordance with approved plans in concurrence and consultation with appropriate regulatory agencies. Necessary land use restrictions will be put in place to ensure protection of human health and the environment as remediation efforts continue in accordance with regulatory agencies. These effects would be slightly greater than under the Middle Bracket scenario.

***Upper Bracket, Indirect*.** Over the long-term, depending on activities of future tenants, minor quantities of hazardous materials, such as cleaning products, fuels, and pesticides, would be required during the use phase of buildings and structures on the property. These materials and wastes would still be expected to have limited impact to the site due to the likely limited quantities and use of these chemicals. The management of the use of these materials would be subject to federal, state, and local regulation. These effects would be slightly greater than under the Middle Bracket scenario.

4.14 CUMULATIVE EFFECTS SUMMARY

4.14.1 Introduction

In this section, the cumulative effects of the proposed alternatives are identified. Cumulative impacts are considered to be those that result from the incremental effects of an action when added to past, present, and reasonably foreseeable future actions, regardless of the agencies or parties involved. Cumulative impacts can result from individually minor, but collectively significant, actions occurring over time. The following section summarizes potential cumulative impacts for each action and within each resource area, as appropriate. For most resources, the analysis area is the same as presented in the resource-specific consequences section. The geographic boundaries of the analysis vary, depending on the resource and potential effects. If different, the analysis area is specifically defined under each resource section. Cumulative impacts are considered for a 20-year period, which is the projected time-frame for implementing redevelopment at Fort Monroe.

4.14.2 Cumulative Actions

The disposal of Fort Monroe will result in the redevelopment of the property. The extent of redevelopment will range from lower than the baseline (present conditions) to a moderately higher intensity of reuse. The indirect effects of the disposal will therefore come from the addition of commercial properties, higher density residential development, mixed-use development, and event space that would increase the traffic flow in the area. The cumulative effects of the disposal and reuse may include growth-inducing effects as well as unrelated regional growth that may affect land use change, population density, or growth rates, and related effects on air, water, and other natural systems.

The area around Fort Monroe has seen significant residential and commercial development. Fort Monroe's ROI is the Virginia Beach-Norfolk-Newport News MSA. This MSA, more commonly known as the Hampton Roads Metropolitan area, includes the North Carolina County of Currituck and the Virginia Counties of Gloucester, Isle of Wight, James City, Mathews, Surry, and York. It also includes the independent Virginia cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. However, the communities nearest Fort Monroe (Phoebus and Buckroe) have been relatively stable for decades, in terms of residential and commercial composition. Although, the state is estimated to continue to grow more than 10 percent in the next 10 years, the City of Hampton is growing at a much reduced rate of approximately 2 percent every 10 years, or 0.2 percent each year (U.S. Census Bureau, City of Hampton 2009c). Furthermore, there are no plans by the City of Hampton that would significantly change the character or density of these communities. They have reached maximum capacity within current zoning restrictions.

In 2003, Phoebus and Buckroe were among six strategic areas near Fort Monroe identified by Hampton city staff as areas that would benefit from developing a master plan for future development of each area. These areas also included Kecoughtan, Downtown Hampton, North King Street, and Coliseum Central Business Improvement District (CCBID). Each master plan outlines an approach to street networks, open space,

waterfront access, land use, housing, and commercial development and includes a series of drawings and illustrations to conceptualize the end state. Regional projects in each of these communities are highlighted in Section 4.2.

The goal of the Phoebus Master Plan is to preserve the unique small-town character of this section of Hampton while emphasizing and building upon the distinct and unique characteristics of the community. Key elements include: new neighborhood gateways; development of a coordinated parking strategy to support new and existing uses along Mellen and Mallory Streets; a public waterfront with coordinated private development, additional community recreation and open space connections; new residential development in the heart of the community (around 170 units per year); development of a commercial node at the intersection of Mercury Boulevard and Mallory Street; phased development of properties along Mallory Street; and strategies for neighborhood revitalization in the north and south Phoebus areas (City of Hampton 2009b).

The Buckroe Master Plan involves a series of recommendations designed to strengthen the unique identity of this beachfront community. Included are suggestions for new housing tailored to meet market demands, new and improved recreational areas and open space, as well as housing that complements the historic beach architecture. Key elements of the Buckroe master plan include improvements to the entrances on Mallory Street, Buckroe Avenue, and Pembroke Avenue; establishing new open space with trails, paths, and restored wetlands; creating multifamily, mixed-income communities with architectural design based on Colonial and Victorian styles to reflect the coastal location of Buckroe; and enhancing commercial development by re-establishing Buckroe Avenue as the community main street. This would include new commercial space and an overall mix of retail that includes small restaurants and local retail (City of Hampton 2009b).

The above development projects, many of which are mixed-use projects planned for the area surrounding Fort Monroe, have been taken into consideration in the development of the Reuse Plan, which, in its implementation, will reflect market realities. The redevelopment of Fort Monroe consistent with the Reuse Plan is substantially larger than those proposed for Phoebus and Buckroe, but is not expected to compete or conflict with other plans or development projects proposed for the region, with the exception of potential conflicts created by transportation effects along major road networks in Phoebus. These redevelopment projects, along with the economic growth projected for the ROI, were considered collectively when evaluating cumulative effects as detailed in the sections below.

4.14.3 Alternatives Overview

4.14.3.1 Early Transfer Disposal

Under the early transfer alternative, cumulative adverse effects would be anticipated for land use, aesthetics and visual resources, air quality, noise, water resources, biological resources, socioeconomics, transportation, and utility systems. Other than the effects associated with the proposed action as discussed in previous sections, no additional

cumulative effects would be anticipated for geology and soils, cultural resources, socioeconomics, and hazardous and toxic substances.

***Land Use*.** Minor to moderate long-term cumulative adverse effects would be expected to occur primarily within the community of Phoebus along roads accessing Fort Monroe. Master plans developed for nearby communities discussed above and in Section 4.2 may spawn additional development, traffic, and noise concerns beyond the effects discussed in Section 4.2 for the Fort Monroe redevelopment along major roads serving Fort Monroe. The addition of more traffic associated with other business development initiatives and regional growth in nearby communities (e.g., baseline traffic is estimated to grow an additional 26 percent in 2031) will exacerbate those same land use conflicts. Redevelopment of the property may also result in a long-term regional rise of property values due to its proximity to commercial and recreational areas.

Aesthetics and Visual Resources. Short-term and long-term minor adverse cumulative effects would be expected for visual and aesthetic resources under early transfer disposal. For further details, see the discussion of potential cumulative aesthetics and visual resources impacts related to implementation of the reuse scenarios below.

***Air Quality*.** Short-term minor adverse cumulative effects would be expected under the early transfer alternative. Cumulative air quality impacts occur when multiple projects affect the same geographic areas at the same time or when sequential projects extend the duration of air quality impacts on a given area over a longer period of time. Ozone precursor emissions associated with engine exhaust from construction equipment and vehicles would contribute slightly to area-wide and regional air quality conditions. Long-term minor adverse cumulative effects would be expected as a result of increased activity at Fort Monroe, including operational emissions and increased traffic flow. Disposal and reuse of Fort Monroe, when added to the cumulative projects in the region, might also stimulate additional economic growth in the ROI over the long-term, which could generate additional emissions from traffic and industry operations within the area. These cumulative effects might create future mitigation issues for businesses that create emissions, given the status of the ROI as a maintenance area for air emissions, and given that any new sources will be regulated and permitted by the VDEQ.

Noise. Minor to significant long-term adverse cumulative effects would be expected for the early transfer disposal from noise impacts to residential areas located along public roads serving Fort Monroe due to past, current, and reasonably foreseeable conditions, as discussed in Section 4.14.3.5. Noise levels would increase from human activity in the local area, tourism, residential development, construction and other employment, and corresponding traffic. Increased traffic associated with Fort Monroe redevelopment would be the principal source of additional noise, with a minor contribution associated with other unrelated development projects and regional growth that is expected in nearby communities. Using the equations presented in Section 4.5, it is estimated that simulated increases in traffic volume associated with other projects and regional growth would contribute an additional 1 dB DNL to estimated noise levels associated with redevelopment at Fort Monroe; thereby exacerbating noise incompatibility concerns along

major roads in Phoebus. Overall, it is estimated that noise levels along major roads in Phoebus may experience an increase of slightly over 5 dB DNL above baseline conditions, which would result in a DNL of slightly above 70 dB under the Upper Bracket scenario at full-build out, which is considered significant.

***Geology and Soils*.** No cumulative effects are expected.

Water Resources. Minor short- and long-term cumulative adverse effects would be expected under the early transfer alternative. Effects would be similar to those discussed in Section 4.14.3.5.

Biological Resources. Short- and long-term minor adverse cumulative effects would be expected to occur as a result of early transfer disposal. Effects would be similar to those discussed in Section 4.14.3.5.

***Cultural Resources*.** No cumulative effects are expected.

Socioeconomics. Long-term minor beneficial effects would be expected. The early transfer of Fort Monroe would enable immediate initiation of redevelopment activities that, when added to other regional development projects, would result in minor increases in population (ranging from 4 to 7.5 percent growth in 2031 compared to baseline conditions in 2005), increased employment creation, increased local sales volume, possible economic diversification, and expansion of the tax base in the local and regional economies.

***Transportation*.** Long-term moderate to significant adverse cumulative effects would be expected near Fort Monroe as a result of the early transfer disposal alternative when added to regional long-term growth in traffic. Effects were previously presented in Section 4.11.2.5, as traffic projection included conservative baseline growth estimates.

***Utilities*.** Long-term minor cumulative adverse effects would be expected. Disposal of Fort Monroe and reuse, as well as development projects planned within the local area, will generate additional needs for utility services and capacity concerns, particularly for water and wastewater services. The combined annual growth in population over the 20-year period and associated service usage for utilities in the City of Hampton would be less than 0.2 percent per year. Therefore, regional utility service is expected to meet this small growth in annual demand. Utility improvements would be likely to occur in order to make the property ready for redevelopment and be sized to accommodate future redevelopment within the region.

***Hazardous and Toxic Substances*.** No changes in cumulative effects would be expected.

4.14.3.2 Traditional Disposal

Under the traditional disposal alternative, cumulative impacts would be very similar to those described above for the early transfer alternative, but they would occur further into the future.

4.14.3.3 Caretaker Status

Under caretaker status, minor cumulative beneficial effects would occur with respect to air quality, noise, geology and soils, biological resources, and certain elements of hazardous and toxic substances. Reduced facility operations would result in decreases in mission activities, resulting in fewer point and nonpoint emissions, reduced water usage, and reduced wastewater generation within the watershed and region. With respect to economic development, caretaker status would result in minor cumulative adverse effects within the ROI, as job loss and decreased expenditures associated with closure would have a minor effect on the overall economy and economic development. However, this may be partially offset from planned growth in the nearby communities as outlined in Section 4.2. This reduction in operations and use will also result in minor adverse cumulative effects to land use, aesthetics and visual resources, and hazardous and toxic substances. There would also be moderate adverse cumulative effects of the caretaker status on aesthetic and visual resources from lack of landscaping and maintenance, and on utility systems. Some utility systems are designed to be continually used over the life of the system, and suspending use of the system may do more harm than good.

4.14.3.4 No Action Alternative

The no action alternative would result in no change to cumulative effects. Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure. Thus, no change in effects would occur because of continuation of the Army's mission relative to conditions in November 2005 and to the continued development within the ROI.

4.14.3.5 Intensity-Based Probable Use Scenarios

Under the all intensity-based scenarios discussed in this EIS, cumulative adverse effects would generally become greater as the intensity of reuse becomes greater. In general, cumulative adverse effects would be anticipated for land use, aesthetics and visual resources, air quality, noise, water resources, biological resources, and transportation. No changes to cumulative effects would be anticipated for geology and soils, cultural resources, utilities, and hazardous and toxic substances. Cumulative effects that would take place under the Middle and Upper Bracket scenarios are minor to moderate with the exception of transportation and noise, where significant adverse effects would be anticipated. Cumulative impacts for the Lower Bracket scenario would be negligible for most resource areas, with the exception of water resources and transportation where minor adverse effects would occur.

***Land Use*.** Cumulative impacts of full implementation of the Reuse Plan on the Fort Monroe property have been accounted for in the analysis of the direct and indirect effects. The following is an explanation of cumulative effects outside of the Fort Monroe property.

Under the Middle and Upper Bracket scenarios, the Fort Monroe redevelopment would, when added to cumulative growth in the region, increase the intensity of land use patterns in the region. Minor adverse cumulative effects to open space and recreation areas would be expected. Minor to moderate adverse cumulative effects from increased traffic and related noise are expected from Fort Monroe redevelopment activities along major roads

in Phoebus. The addition of this traffic associated with other business development initiatives and regional growth in nearby communities could exacerbate those same land use conflicts. Furthermore, development of the higher intensity reuse scenarios would likely involve an increase of development and investment capital in the local area, which may spawn adjacent development (e.g., nearby hotels, restaurants, and residential areas).

This increase in regional development could create localized incompatible land use conditions; however, adherence to existing community master plans (see Section 4.2) will minimize such potential conflicts. The proposed redevelopment would also likely have the effect of better integrating the property at Fort Monroe into surrounding communities. The unique nature of the residential development represented by the Middle and Upper Bracket scenarios may also attract relocation to the local area.

Aesthetics and Visual Resources. Short-term minor adverse cumulative effects would be expected on visual and aesthetic resources as a result of the Middle and Upper Bracket scenarios. After completion of redevelopment, the built environment surrounding Fort Monroe might increase due to induced growth and the planned cumulative developments unrelated to reuse activities. Increased development and potential loss of open space in the local area will result in minor adverse cumulative effects to visual and aesthetic resources in the local area.

The Norfolk and Hampton areas have limited open public waterfront space due to long-term coastal development pressure and large military presence. For example, a study commissioned by the Fort Monroe National Park Foundation, found that the City of Hampton and Norfolk area had a lower percentage of parkland (by area) and public shoreline (by mile) as compared to San Francisco, New York, and Boston (The Trust for Public Land [TPL] 2008), suggesting that the Norfolk study area (i.e., the five city Hampton Roads area) is deficient in available park and open space. However, further analysis of the statistics presented in this study, along with census data, supports alternate conclusions. For example, the per capita acreage of parkland and public shoreline in the Norfolk study area (~1.6 million people) are actually much higher than the per capita rates for San Francisco (~2 million people in the three city area studied), New York (~8 million people), and Boston (~0.5 million people). This finding suggests that the citizens of the Norfolk study area may have more parkland and public shoreline per person than in the example metropolitan areas highlighted in the TPL report (2008). Furthermore, it is unclear whether all lands that are utilized as park areas in the Norfolk area were included as such in the TPL study (e.g., Newport News Park was not included in the study) (FMFADA 2009). The report also derives per capita parkland and shoreline statistics which indicate that the Norfolk study area is below average in available space, as compared to other unnamed U.S. cities of similar density (TPL 2008). However, TPL also reports that the average per capita park rates for intermediate-low to high density cities ranges from 6.1 to 15.6 acres per 1,000, which are lower than the per capita rate for the Norfolk study area of 19 acres per 1,000 (TPL 2009) (the City of Hampton was 14 acres per 1,000). Furthermore, the three major cities surrounding San Francisco Bay (i.e., San Francisco, San Jose, and Oakland) which were identified as being collectively similar to the Norfolk study area were

calculated to have a lower per capita rate of parkland acreage (12 acres per 1,000) and approximately one fifth of the public shoreline as compared to the Norfolk study area.

Thus, the conclusion of the TPL study that the Norfolk study area is deficient in available parks and public shoreline is not fully supported by the data. In any event, Army control of Fort Monroe has preserved much of the coastal area as open space, with its historic and natural vistas across the Chesapeake Bay and Mill Creek. The majority of the current open space will be preserved, the historic character will be enhanced, and, with transfer, these areas will be more open for broader use and enjoyment by the general public in the region.

Air Quality. Cumulative air quality impacts occur when multiple projects affect the same geographic areas at the same time or when sequential projects extend the duration of air quality impacts on a given area over a longer period of time. Trends in air quality within the Hampton area suggest that air quality conditions are improving, due to its maintenance status. Nonetheless, additional economic growth projected for the region suggests that additional point and mobile sources will be added to the area and may exacerbate air quality conditions. On the other hand, increases in fuel efficiency and reductions in vehicle emissions will continue to provide long-term benefits. Furthermore, total emissions under the Middle and Upper Bracket scenarios make up a negligible percentage of emissions at the county and regional level, and are below *de minimis* thresholds. As such, reuse would be expected to have only a minor cumulative adverse effect on air quality, even with the added growth in the region.

Noise. Minor long-term adverse to significant cumulative effects would be expected for the Middle and Upper Bracket scenarios when added to the cumulative projects, from noise impacts to residential and business areas located along public roads serving Fort Monroe, particularly along major access roads in Phoebus. As previously discussed, baseline noise levels in this highly urban residential setting are at or just below 65 dB, in part due to the contribution of military aircraft and ships that operate in the Norfolk region and local traffic. When proposed noise increases are added to past conditions, current proposed actions and unrelated projects in the region, and reasonably foreseeable future growth and projects, it is estimated that noise impacts in residential areas will range from minor to significant in 20 years, relative to current conditions. Noise levels would increase from human activity in the local area, tourism, residential development, construction and other employment, and corresponding traffic. Increased traffic associated with Fort Monroe redevelopment would be the principal source of additional noise, with a minor contribution associated with other unrelated development projects and regional growth that is expected in nearby communities.

It is estimated that on average Fort Monroe redevelopment will generate over 80 percent of the increased traffic (and associated noise) during the evening peak hours and weekend that will be experienced during the build-out period along major roads in Phoebus, relative to other unrelated development projects and regional growth. Using the equations presented in Section 4.5, it is estimated that simulated increases in traffic volume associated with other projects and regional growth would contribute an additional 1 dB to estimated noise levels associated with redevelopment at Fort Monroe (which are

estimated to exceed 65 dB), thereby increasing noise concerns. However, increases of less than 3 dB are difficult to detect; therefore the incremental contribution of other new projects and regional growth is considered minor. Even though it is estimated that noise levels along major roads in Phoebus may experience an increase of only slightly over 5 dB DNL above baseline conditions, this change would result in an increase to 70 dB DNL, which is considered a significant impact.

***Geology and Soils*.** No cumulative effects are expected.

Water Resources. Minor short-term and long-term cumulative adverse effects would be expected under all reuse scenarios. These effects would occur as a result of direct, indirect, and induced economic growth and cumulative development that would generate increased construction within the watershed, increases in impervious surface within the watershed, increased water usage from key regional water sources, and increased wastewater discharge. These effects would have the potential to affect areas beyond the installation property boundaries at the watershed level. However, the effects would be expected to be reduced because ESC and other BMPs would routinely be employed during construction, demolition, and renovation activities, and because the impacts would be spread over the area over many years.

Biological Resources. Short-term and long-term minor adverse cumulative impacts would be expected to occur as a result of Middle and Upper Bracket scenarios. Increased development activity and regional growth, including demolition and construction in the local area, could result in additional adverse effects to biological resources. Although most terrestrial biological resources in the area are not particularly sensitive and highly disturbed already, they do create a semi-natural area in some limited areas within the City of Hampton. The potential for additional loss in natural habitat (including the potential for additional loss in wetland habitat and increases in impervious surface) would result in minor adverse cumulative effects to terrestrial and aquatic biological resources. It should be noted, however, that any wetland losses would require strict mitigation requirements (including wetland creation) and consultation with USACE, Norfolk District.

***Cultural Resources*.** No cumulative effects are expected.

Socioeconomics. Long-term minor beneficial effects would be expected. The Middle and Upper Bracket scenarios, when added to other regional development projects, would result in minor increases in population (ranging from 4 percent to 7.5 percent growth in 2031 compared to baseline conditions in 2005), increased new job creation, increased local sales volume, possible economic diversification, and expansion of the tax base in the local and regional economies. Given the slow baseline population growth rate projected for the area of approximately 0.2 percent per year, estimated annual changes in baseline socioeconomic activity due to other projects and regional growth are expected to cause very minor changes to the effects discussed in Section 4.10.

***Transportation*.** Transportation modeling outlined in Section 4.11 and Appendix H factored in regional cumulative growth in traffic, thus the results reflect the effect of reuse when added to regional cumulative growth. The results of this analysis also indicate that

significant adverse effects may be avoided with reasonable upgrades to the transportation networks over the 20 year redevelopment horizon. Long-term moderate to significant adverse cumulative effects would be expected near Fort Monroe as a result of the Middle and Upper Bracket scenarios, when added to regional long-term growth in traffic. These effects may be temporary, as transportation infrastructure is expected to be upgraded in the future.

***Utilities*.** Long-term minor cumulative adverse effects would be expected as a result of the Middle and Upper Bracket scenarios. Disposal of Fort Monroe and reuse, as well as development projects planned within the local area, will generate additional needs for utility services and capacity concerns, particularly for water and wastewater services. The combined annual growth in population over the 20 year build-out period (Fort Monroe development, when added to baseline growth projections) and associated service usage utilities in the City of Hampton would be less than 0.5 percent per year under the Upper Bracket scenario. Therefore, regional utility service is expected to meet this small growth in annual demand for all scenarios considered in this EIS. Utility improvements would be likely to occur and be sized to accommodate future redevelopment within the region.

***Hazardous and Toxic Substances*.** No cumulative effects are expected.

4.15 MITIGATION AND MANAGEMENT MEASURES

The Army's methodology is to create encumbrances to protect specific resources only when required by a specific statute or as a result of final agreements with regulatory agencies. For example, CERCLA Section 120, requires deeds to include a right of the U.S. to re-enter the property to undertake required remedial action. In other cases, statutes may impose restrictions on all owners. In such cases, a specific encumbrance is not required. A deed restriction runs with the land forever or until removed in accordance with its own terms.

Federal, state, and local regulations and policies applying to entities that receive properties at Fort Monroe will govern to a large extent the appropriate use and conservation of the environment, including air quality, wetlands resources, water quality, cultural resources, and other resources. Beyond such regulations and policies, mitigation and management measures may be implemented by the Army or the FMA in order to successfully manage the disposal and redevelopment of Fort Monroe according to the principles of sound and sustainable planning as outlined below.

Specific deed notification and restrictions required of the Army and the FMA in keeping with the assumptions of this EIS, along with mitigation and management measures that will ensure successful management of environmental resources according to the principles of sound environmental planning, are outlined below for each alternative.

A PA for the Closure and Disposal of Fort Monroe has been legally executed by the signing of authorized representatives of the Army, the Virginia SHPO, the ACHP, the Commonwealth of Virginia, the FMFADA, and the NPS. Army obligations fully described in the PA (Appendix F of this EIS) are considered mitigations required under the NHPA. Specific mitigation measures the Army commits to perform for both disposal alternatives are outlined below.

- Incorporation in the deeds and continuing enforcement of historic preservation restrictions, covenants, and/or easements on non-reversionary land.

- If a site investigation or remediation will or may have an adverse effect on certain properties (defined in Appendix F), the Army will develop a plan, in consultation with the SHPO, to avoid, protect, or recover information or prepare appropriate documentation. The Army will also be required to determine whether or not such activities will have a potential affect on cultural landscapes that contribute to the NHL District, and prepare a landscape treatment plan if necessary in accordance with the terms outlined in the PA.

- Identify significant viewsheds from and toward the Fort Monroe NHL District within 18 months of the execution of the PA.

- Submit a Cultural Landscape Study within18 months of the execution of the PA that will document the evolution of the land form at Fort Monroe from its earliest known occupation to the present.

- Conduct property management to the standard of DoD BRRM (1 March 2006) until transfer out of Army ownership. Property management requirements will include: continued consultation on non-BRAC undertakings in accordance with 26 CFR Part 800; development of protections for deeds and lease agreements, as well as adherence to administrative requirements specified in the PA; and provide schedule updates regarding vacating buildings to the Commonwealth and FMFADA.

- Mothballed buildings and structures that have been or will remain vacant for 12 months or longer, or if there is no planned use for them, will be preserved in accordance with NPS guidance found in NPS Preservation Brief 31 and related requirements outlined in the PA.

- Revise the Fort Monroe NHL District nomination to more clearly define boundaries of the NHL and to more accurately identify those buildings, structures, objects, archaeological sites, historic viewsheds, and landscape features that contribute to the Fort Monroe NHL District.

- Complete draft NRHP nominations for those buildings at Fort Monroe identified as individually eligible and submit them to the SHPO for review and concurrence, and then submit the nominations to the NPS for listing.

- Consider, under the guidance of the CMH, the on-site loan of all or part of the collections pertinent to Fort Monroe's historic significance.

- Provide, upon request by the FMFADA, copies of specific archival materials (letters, photos, documents, etc.) and information on individual artifacts (accession records, files, notes, etc.) from the Casemate Museum's indexed collection.

- Conduct additional archaeological testing within the boundary of Fort Monroe to identify any remnant of the former Freedmen's Cemetery (current field investigations are ongoing and will be reported separately from the EIS process).

- Establish, within 18 months of the execution of the PA, procedures to make available to the FMFADA and Commonwealth appropriate documents related to historic and other properties on Fort Monroe, such as maintenance records, architectural plans, survey materials and similar documents, to facilitate the proper management of Fort Monroe.

- Provide notice to the FMFADA and the Commonwealth of the future locations of all collections removed from Fort Monroe. The FMFADA and the Commonwealth may request, from the Army, access to such collections in accordance with Army policies and regulations.

4.15.1 Early Transfer/Traditional Disposal Alternatives

Beyond the mitigation requirements specified in the PA, the Army will implement appropriate management measures to fulfill obligations pertaining to Army policy and regulations for the disposal of property, and may implement additional mitigation to avoid, reduce, or compensate for adverse effects that might occur as a result of early transfer or traditional disposal, as outlined below.

- Develop sample conveyance documents that would notify future owners of particular notification requirements concerning natural and cultural resources in accordance with Army regulations and guidance (see Appendices F and I). These documents would also identify past hazardous substance activities at each site, as required by CERCLA and CERFA, including restrictions on land use (e.g., groundwater use).

- Continue to work with the FMFADA to ensure that disposal transactions are consistent with the adopted Reuse Plan.

- Continue remediation actions as prioritized by the Army and completing all required remediation prior to traditional disposal.

- Until final disposal, maintain installation buildings, infrastructure, and natural resources to the extent provided by Army policy and regulations.

- Manage all environmental resources to ensure that the federal facility remains in compliance with state and federal laws and local regulations.

4.15.2 Caretaker Status Alternative

Beyond the mitigation requirements specified in the PA, the Army will implement appropriate management measures to fulfill obligations pertaining to Army policy and regulations relative to caretaker conditions, and may implement additional mitigation to avoid, reduce, or compensate for adverse effects that might occur as a result of early transfer or traditional disposal, as outlined below.

- Conduct installation security and maintenance operations to the extent provided by federal policies and regulations.

- Continue to identify clean or remediated portions of the installation excess properties and prioritize restoration and cleanup activities.

- Recycle solid waste and debris where practicable.

- Continue remediation actions as prioritized by the Army.

- Maintain necessary natural and cultural resources management measures, including continued close coordination with other agencies.

- Actively support the leasing of property over the interim period between closure and redevelopment, where environmental restoration efforts permit, to provide for job creation, habitation and maintenance of structures, and rapid reuse of the installation.

4.15.3 No Action Alternative

Under the no action alternative, the Army would continue operations at Fort Monroe at levels similar to those occurring prior to the 2005 BRAC Commission's recommendations for closure. This continuation of operations would include the continuation of the Army's obligations as stewards of environmental and cultural resources, as required by federal laws, policies, and E.O.s. Thus, no changes to existing effects would occur relative to continuation of the Army's mission relative to conditions in November 2005. Implementation of this alternative is not possible, however, because the BRAC closure recommendations have the force of law.

4.15.4 Reuse Scenarios

Under the intensity-based reuse scenarios, non-Army entities would assume reuse planning and execution of redevelopment actions. Measures to reduce or avoid impacts associated with intensity-based reuse scenarios, including specific mitigation measures, except for those related to federally protected interests, remediation, or other Army concerns, are not the responsibility of the Army but are the responsibility of those who are redeveloping the property. As previously discussed, the Army would develop conveyance documents and implement other measures to reduce adverse effects from reuse, including implementing mitigation measures specified in the PA for the protection of cultural resources. Specific mitigation measures that may be implemented by non-Army entities to reduce adverse effects to the transportation network from property reuse are outlined in Section 4.11 and Appendix H. Potential mitigation measures that may be implemented by non-Army entities to reduce adverse effects from noise are outlined in Section 4.5. Additional potential mitigation measures that may be implemented by non-Army entities for reducing other adverse effects were previously discussed in Sections 4.2 through 4.13, as appropriate. An overview of the potential mitigation measures that may be implemented by non-Army entities are outlined below, along with an assessment of the likelihood of implementation (presented in brackets below).

- Utilize Green Building, Low Impact Design, and stormwater BMPs for reducing adverse impacts from increased impervious surface, stormwater runoff, improving water quality discharge, reducing wastes, and minimizing energy consumption from redevelopment and construction activities. Specific mitigation includes: utilization of permeable surfaces for parking areas and walkways, green roofs, conservation and restoration of vegetative buffers, utilization of rain gardens and rain barrels, diverting runoff from paved areas to vegetative areas, construction and maintenance of bioretention units and swales, utilizing directional drilling for stream crossings, avoiding the use of machinery and construction vehicles within riparian areas, avoiding trenching activities that drain wetlands, conserving top soil for reseeding, closely monitoring erosion and stormwater impacts from construction, utilizing geotextiles to reduce erosion risk, and revegetating disturbed areas (see

also Appendix A, VDEQ letter dated 6 November 2009 for further details) [*Implementation:* Certain mitigation may be required for implementation as part of the permitting process for the protection of surface water as part of stormwater and point discharge permits (VPDES), development of required stormwater pollution prevention plans, ECS plans, surface water encroachment permits administered by the VMRC, and other regulatory requirements. Beyond adherence to regulatory and permitting requirements, implementation of additional mitigation measures is uncertain.].

- Establish a "no discharge zone" for Mill Creek and at the mouth of the James River between the Old Point Comfort (DFMWR, Outdoor Recreation 2008) Marina and the HRBT [*Implementation:* Potential for implementation is uncertain given the requirement for other state and Federal agencies to participate and approve such a designation.].

- Develop a wide riparian buffer along the shoreline of Mill Creek to protect surface water quality from stormwater contaminants and monitor outfalls [*Implementation:* Continued management of riparian buffers is required under the CBPA Act which includes establishment of 100 foot buffer zones as part of the designated RPAs and adherence to general performance criteria outlined in 9 VAC 10-20-120 *et seq*. Also, the reuse plan conserves northern shorelines along Mill Creek for conservation and non-consumptive recreational purposes.].

- Conduct a wetlands delineation study in the area of the northern connector footprint to assess potential wetland impacts and mitigation requirements in coordination with USACE, Norfolk District and VWPP [*Implementation:* Mitigation actions are required, in accordance with Section 404 and Virginia Code §62.1-44.15:5 through a joint permit process, see also Appendix A, VDEQ letter dated 6 November 2009 for further details. Through the joint permitting process specific mitigation practices will be outlined and developed for avoiding and minimizing adverse impacts to wetlands. Compensation through the purchase of credits from mitigation banks or creation, enhancement or preservation of wetlands and stream bank habitat will be required for unavoidable adverse impacts for wetlands over $1/10^{th}$ acre or stream banks of more than 300 linear feet.

- Utilize a working bridge design, instead of a causeway, for a northern entrance to partially mitigate adverse impacts associated with construction [*Implementation:* Future implementation of a working bridge, as opposed to a causeway, is uncertain.].

- Develop a natural resources management plan based on, and in the style of, Fort Monroe's current INRMP, which could include: addressing the management of invasive species (e.g., controlling *Phragmites*); conservation and protection of live oaks; restoration of native species (particularly in buffer zones and in the northern area); developing oyster reefs; creating birding and wildlife observation areas and low impact trails; reducing and monitoring direct stormwater discharges to Mill

Creek and the Chesapeake Bay; and conservation and restoration of the northern area and marshes (see also Appendix A, VDEQ letter dated 6 November 2009 for further details) [*Implementation:* Development of a formal management plan is uncertain, but partial implementation of conservation measures is likely given current plans to conserve these areas, as specified in the reuse plan.].

- Develop an Environmental Management System (EMS) for addressing comprehensive environmental management issues, pollution prevention, water conservation, and energy conservation measures through the redevelopment process (specific recommendations for developing an EMS are further detailed in VDEQ's letter dated 6 November 2009) [*Implementation:* Development of a formal EMS is uncertain.].

- Conduct noise monitoring, analysis, and study along major road networks to confirm and evaluate noise impacts to residential areas, and implement noise abatement techniques for new construction, if necessary [*Implementation:* Potential implementation of noise studies and design standards, if deemed necessary, is very likely, as the FMA has committed to studying the utility and benefit for such measures in their 26 October 2009 DEIS comment letter which is included in Appendix A.].

- Potential mitigation for reducing air emissions include: giving preference through the bidding process to "Green/Clean" Contractors; limiting construction on high ozone days; implementing anti-idling restrictions for both on-road and non-road vehicles and equipment; watering unvegetated and disturbed areas; watering unpaved roads multiple times daily during construction activities to reduce dust emissions; requiring reduced speeds on unpaved areas; and using Low Sulfur Diesel, alternate fuels, or fuel additives [*Implementation:* Beyond permitting requirements, implementation of additional mitigation is uncertain.].

- Utilizing detailed viewshed and light/glare analysis to assess and minimize changes in aesthetic character prior to individual construction projects [*Implementation:* At least partial implementation is likely given viewshed study requirements specified in the PA.].

- Evaluate and preserve viewsheds to and from the Chesapeake Bay, Mill Creek, and the stone fort [*Implementation:* At least partial implementation is very likely given the mitigation requirements for a viewshed analysis specified in the PA, and the current plans to conserve green space along Mill Creek in the northern portions of the property.].

- Conserve and create open space along waterfront open lands and green linkages between the upper and lower fort to preserve viewsheds and landscapes through conservation of existing greenspace and creation of open space through demolition of unused structures [*Implementation:* Partial implementation is likely given current plans to conserve most of the existing greenspace and linkages through implementation of the current reuse plan. However, creation of expansive

greenspace and open space along waterfronts and other areas from demolition of unused structures, such as in the Wherry Quarter, is unlikely given the potential for future redevelopment in this area.].

- Upgrading of the wastewater systems, including manholes, to reduce or eliminate groundwater and stormwater infiltration [*Implementation:* Implementation is likely given current plans to upgrade these systems as specified in the reuse plan.].

- Continue active management of live oaks and sensitive coastal habitat, and integrating their conservation into future development projects [*Implementation:* Implementation is likely given current plans to conserve live oak trees, preservation of historic district buildings in the lower fort (where most of the trees reside), and preservation of the majority of the coastal habitat as specified in the reuse plan.].

- Conduct a study to develop mitigation and implementation strategies to address potential flood hazards related to sea level rise and hurricane effects, as well as ensure compliance with flood insurance requirements [*Implementation:* Implementation is very likely due to flooding concerns, insurance requirements, and reuse plan priorities.].

- Conduct a study to develop evacuation strategies and plans for residential and recreational areas in the event of severe weather and flooding events [*Implementation:* implementation is very likely due to flooding concerns, insurance requirements, and existing regional planning efforts.].

- Implement pollution prevention measures, including reuse and recycling programs, and waste reduction measures to reduce solid wastes generated from redevelopment [*Implementation:* Implementation is uncertain.].

- Consistent with the NHPA and PA, continue to maintain and protect cultural resources of Fort Monroe (as further discussed in Section 4.15 and Appendix F) [*Implementation:* Mitigation is required, in accordance with the terms of the PA and NHPA.].

- Utilize adaptive management, proactive planning, and targeted transportation upgrades (suggested methods are outlined in Section 4.11 and Appendix H) to address long-term transportation network problems [*Implementation:* Transportation mitigation is very likely to be required in coordination with VDOT and local municipalities.].

- Conduct further transportation planning studies in coordination with VDOT, the City of Hampton, FMFADA, and other stakeholders as appropriate to ensure that the most effective and viable transportation upgrades are planned and implemented (see Section 4.11.2.5 for a list of specific mitigation projects for relieving traffic congestion), including identification of funding sources and implementation strategies in order to reduce traffic congestion [*Implementation:* Transportation planning is ongoing and new transportation projects are likely to be required in

coordination with VDOT and local municipalities, pending availability of funding and redevelopment schedules.].

- Provide transit-oriented developments, transit options, bike paths, shuttles, and ride-sharing between commuters to minimize greenhouse gas emissions and traffic congestion [*Implementation:* Transportation planning is ongoing and such projects may be developed, but their implementation is uncertain pending the outcome of future coordination with VDOT and local municipalities and availability of funding.].

- Conduct additional studies and exercise careful planning to minimize system capacity stresses, to ensure sufficient utility service is provided throughout redevelopment phases [*Implementation:* Implementation is highly likely, as such planning is ongoing and is planned to continue throughout the redevelopment process.].

4.16 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource (e.g., energy or minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species). The no action alternative and the disposal alternatives would not result in any irreversible or irretrievable commitment of resources. Development will physically eliminate or diminish the character of already highly disturbed natural resources on up to 25 acres of open green space (consisting mainly of mowed lawns and open fields) and limited river bottom habitat for the construction of up to 5 docks (see Section 4.8.2 for further discussion of natural resource impacts). If the northern entrance were to be constructed in the future, then up to 1 acre of tidal wetlands habitat may also be disturbed. The disposal of property, although an irreversible action, does not represent an irretrievable commitment of land resources. To the contrary, this action makes resources available for future reuses. Disposal and reuse also represents the irretrievable commitment of human resources and materials to the action. Both will require the use of fossil fuels, electrical energy, and other energy resources during both the construction and operation of facilities. These resources would be irretrievably committed to the action.

4.17 SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term uses of biophysical components of the environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than five years. Long-term uses of the environment include those impacts occurring over a period of more than five years, including permanent resource loss. Permanent short-term and long-term resource losses include: loss of less than 1 acre of tidal wetlands from construction of a northern connector, loss of up to 25 acres of open space as a result of redevelopment, construction disturbance of up to 75 acres of previously developed land, and loss of certain old growth trees.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. For example, loss of other important coastal or forest habitat are examples of actions that affect long-term productivity. In the case of Fort Monroe land disposal and redevelopment, there are only minor changes to short-term and long-term resource usage, as outlined above. Loss of highly disturbed open green space, limited natural habitat, increased impervious surfaces, and loss of some old growth trees will have some adverse effects on long-term biological productivity of Fort Monroe. Under all the reuse scenarios, future short-term disturbances (e.g., due to construction and demolition) would have adverse effects on air quality, storm water runoff, noise, traffic circulation and roadways, energy consumption, and aesthetics, as previously discussed. Disposal of Fort Monroe would facilitate long-term economic productivity by allowing future economically beneficial reuse of the property. The no action alternative would hinder long-term economic productivity by restricting future development.

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Phoebus Branch Library
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Hampton, VA 23663

Willow Oaks Branch Library
227 Fox Hill Road,
Hampton, VA 23669

George Wythe Law Library
101 Kings Way, 2nd Floor
Hampton, VA 23669

Norfolk Main Library
235 East Plume Street
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Pretlow Anchor Branch Library
111 Ocean View Avenue
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9.0 ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
ACM	Asbestos Containing Materials
ADT	Average Daily Traffic
AFB	Air Force Base
AQCR	Air Quality Control Regions
Army	Department of the Army
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
Base Closure Act	Defense Base Closure and Realignment Act of 1990
BEA	U.S. Bureau of Economic Analysis
BLS	U.S. Bureau of Labor Statistics
BMP	Best Management Practices
BP	Before Present
BRAC	Base Closure and Realignment
BRAC Commission	Base Closure and Realignment Comimission
BRRM	Base Redevelopment and Realignment Manual
ca.	Approximately
CAA	Clean Air Act
CBPA	Chesapeake Bay Preservation Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CMH	U.S. Army Center of Military History
CO	Carbon Monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	Decibel
DEH	Directorate of Engineering and Housing
DEIS	Draft Environmental Impact Statement
DFMWR	Directorate of Family and Morale, Welfare, and Recreation
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DOI	U.S. Department of the Interior
DPW	Directorate of Public Works
DVP	Dominion Virginia Power
E.O.	Executive Order
EA	Environmental Assessment
ECP	Environmental Condition of Property
EDC	Economic Development Conveyance
EIFS	Economic Impact Forecast System

EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
ETA	Early Transfer Authority
FAA	Federal Aviation Administration
FADA	Federal Area Development Authority
FAR	Floor Area Ratio
FE	Federally Endangered
FHWA	Federal Highway Administration
FMA	Fort Monroe Authority
FMFADA	Fort Monroe Federal Area Development Authority
FPASA	Federal Property and Administrative Services Act
FT	Federally-listed Threatened
FY	Fiscal Year
g/m^3	Grams/Cubic Meter
GCD	General Conformity Determination
HABS/HAER	Historic American Building Survey/Historic American Engineering Record
HAP	Hazardous Air Pollutants
HARAM	Historic Architecture Repair and Maintenance Plan
HIR	High Intensity Reuse
HRBT	Hampton Roads Bridge-Tunnel
HRSD	Hampton Roads Sanitation District
HRT	Hampton Roads Transit
HUD	U.S. Department of Housing and Urban Development
I	Interstate
I&I	Inflow and Infiltration
IAP	Installation Action Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
KV	Kilovolt
LBP	Lead-Based Paint
LEQ (LEQ)	Equivalent Sound Level
LF	Linear Feet
LIR	Low Intensity Reuse
LOS	Level of Service
LQG	Large Quanity Generator
LRA	Local Redevelopment Authority
MACT	Maximum Achievable Control Technology
MBTA	Migratory Bird Treaty Act
MEC	Munition and Explosives of Concern
MHIR	Medium-High Intensity Reuse
MIR	Medium Intensity Reuse
MLIR	Medium-Low Intensity Reuse
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement

mph	Miles Per Hour
MSA	Metropolitan Statistical Area
NAA	Nonattainment Areas
NAAQS	National Ambient Air Quality Standard
NAGPRA	Native American American Graves Protection and Repatriation Act
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NNWW	Newport News Waterworks
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOI	Notice of Intent
Nox	Nitrogen Oxides
NPS	National Park Service
NRHP	National Register of Historic Places
O_3	Ozone
PA	Programmatic Agreement
PCB	Polychlorinated Biphenyls
pCi/L air	picocuries per liter
$PM_{2.5}$	Particulate matter < 2.5 microns
PM_{10}	Particulate matter ≤10 microns
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
Pub. L.	Public Law
PVC	polyvinyl chloride
PX	Post Exchange
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
ROI	Region of Influence
RPA	Resource Protection Areas
RTV	Rational Threshold Value
SAA	Satellite Accumulation Area
SC	Special Concern
SE	State Endangered
SF	Square Feet
SHPO	State Historic Preservation Officer
SI	Site Inspection
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxide

SSC	State Special Concern
ST	State Threatened
SWM	Stormwater Management Plan
TPL	Trust for Public Land
tpy	Tons Per Year
TRADOC	U.S. Army Training and Doctrine Command
TSCA	Toxic Substances Control Act
U.S.	United States
U.S.C.	U.S. Code
USAEHA	U.S. Army Environmental Hygiene Agency
ug/m^3	micrograms per cubic meter
URBEMIS	Urban Emissions
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Society
UST	Underground Storage Tanks
VCI	Virginia Council on Indians
VCP	Virginia Coastal Resources Management Program
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Depart of Game and Inland Fisheries
VDH	Virginia Department of Health
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VMRC	Virginia Marine Resources Commission
VNG	Virginia Natural Gas
VOC	Volatile Organic Compounds
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
VWPP	Virginia Water Protection Permit
WWI	World War I
WWII	World War II
WWTP	Wastewater Treatment Plant