DRAFT

ENVIRONMENTAL ASSESSMENT

RECONFIGURATION OF THE WALLOPS FLIGHT FACILITY MAIN ENTRANCE

Prepared for

National Aeronautics and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, VA 23337

March 2011

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA 23337

Lead Agency:	National Aeronautics and Space Administration
Proposed Action:	Wallops Flight Facility Main Entrance Reconfiguration
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ABSTRACT

This Environmental Assessment (EA) addresses the proposed reconfiguration of the main entrance to the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center's (GSFC) Wallops Flight Facility (WFF), located in Accomack County on the Eastern Shore of Virginia. Under the Proposed Action, NASA would reconfigure the main entrance to the Main Base to alleviate safety concerns created by the current layout. The proposal includes construction of a badge office and visitor parking area, security personnel parking area, truck inspection area, guard house and canopy, a traffic roundabout, and Shipping and Receiving Facility.

This EA analyzes the potential environmental consequences of reconfiguring the main entrance to the Main Base under the No Action alternative (i.e., *status quo*) and two Action Alternatives. This assessment evaluates topography and drainage; land use; surface water; stormwater; air quality; climate change; noise; hazardous materials and hazardous waste; vegetation; terrestrial wildlife and migratory birds; health and safety; transportation; and cultural resources.

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Appendix A - Federal Consistency Determination

ACAM	Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
AFCEE	Air Force Center for Environmental Excellence
APE	Area of Potential Effects
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	Methane
CMA	Coastal Management Area
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
CRA	Cultural Resources Assessment
CWA	Clean Water Act
CZM	Coastal Zone Management
dB	decibel
dBA	decibel weighted to the A-scale
DCR	Department of Conservation and Recreation
DHR ID#	Department of Historic Resources Identification Number
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJIP	Environmental Justice Implementation Plan
EMS	Environmental Management System
EO	Executive Order
EPA	Environmental Protection Agency
ERD	Environmental Resources Document
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
ft^2	square feet
GHG	Greenhouse Gas
GOV	Government Owned Vehicle
GSFC	Goddard Space Flight Center
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
ICP	Integrated Contigency Plan

L_{eq}	Equivalent Sound Level
$L_{eq}(h)$	Hourly value of L_{eq}
LOS	Level of Service
m^2	square meters
MARS	Mid-Atlantic Regional Spaceport
MBTA	Migratory Bird Treaty Act
MD	Maryland
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NH_3	Ammonia
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NO_X	Nitrous Oxides
NPDES	National Pollutant Discharge Elimination System
NPR	NASA Procedural Requirement
NRHP	National Registry of Historic Places
O_3	Ozone
OSHA	Occupational Safety and Health Administration
Pb	Lead
PM_{10}	Particulate Matter less than 10 microns in diameter
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
POV	Personally Owned Vehicle
ppm	parts per million
PTE	Potential to Emit
RAC	Risk Assessment Code
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
SCS	Soil Conservation Service
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan

U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VA	Virginia
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VHB	Vanasse, Hangen, and Brustlin, Inc.
VMRC	Virginia Marine Resources Commission
VOC	Volatile Organic Compound
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WFF	Wallops Flight Facility
WINWR	Wallops Island National Wildlife Refuge
WRP	Wallops Research Park
WSDOT	Washington State Department of Transportation

1 Mission, Purpose and Need, Background Information

The National Aeronautics and Space Administration (NASA) has prepared this Environmental Assessment (EA) to define, evaluate, and assess the potential environmental impacts of improvements to the main entrance to the Wallops Flight Facility (WFF) Main Base. In recent years there has been a marked increase in the amount of vehicular traffic around the main entrance to WFF. The resultant increased congestion has created unsafe conditions for pedestrians and vehicles in this area. WFF proposes to reconfigure the main entrance to increase personnel safety and decrease congestion.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA), as amended (Title 42 of the United States Code (U.S.C.) 4321–4347), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500–1508), NASA's regulations for implementing NEPA (14 CFR Subpart 1216.3), and the *NASA Procedural Requirement (NPR) for Implementing NEPA and Executive Order (EO) 12114* (NPR 8580.1). NEPA requires the preparation of an EA for Federal actions that do not qualify for a Categorical Exclusion and may not require an Environmental Impact Statement (EIS).

In 2005, NASA prepared a Site-wide Environmental Assessment (Site-wide EA), which provides a framework to evaluate typical recurring and reasonably foreseeable future actions undertaken by NASA and its partners at WFF.[1] The Proposed Action for the Site-wide EA was to continue existing WFF operations, expand operations, and improve facilities. Early in its planning stages, the proposed WFF Main Entrance Reconfiguration Project was compared to the Site-wide EA and found to be outside the actions addressed by that document. Therefore, NASA is preparing this EA to analyze the potential environmental effects from the proposal. If this EA determines that the environmental effects of the Proposed Action are not significant, a Finding of No Significant Impact (FONSI) will be issued. Otherwise, a Notice of Intent to prepare an EIS will be published.

This EA will be reviewed for adequacy if major changes to the Proposed Action are under consideration or substantial changes to the environmental conditions occur. As such, the document may be supplemented in the future to assess new proposals or to address changes in existing conditions, impacts, and mitigation measures.

[1] The Site-wide EA can be accessed at (http://sites.wff.nasa.gov/code250/docs/Final Site-Wide EA.pdf).

1.1 Wallops Flight Facility

1.1.1 Mission

During its early history, the mission of the NASA Goddard Space Flight Center's (GSFC's) WFF was primarily to serve as a test site for aerospace technology experiments. Over the last several decades, the WFF mission has evolved toward a focus of supporting scientific research through carrier systems (i.e., airplanes, balloons, rockets, and uninhabited aerial systems) and mission services.

Although NASA is the land owner at WFF, WFF supports multiple NASA tenants and partners, including the U.S. Navy, U.S. Coast Guard, Marine Science Consortium, Mid-Atlantic Regional Spaceport (MARS), and the National Oceanic and Atmospheric Administration (NOAA). Each tenant partially relies on NASA for institutional and programmatic services, but also has its own missions. WFF is a national resource with the facilities, personnel, core competencies, and low cost of operations to provide world-class, end-to-end services for small- to medium-sized missions. It is a fully capable launch range for rockets and balloons, and is also a research airport. In addition, Wallops personnel provide mobile range capabilities, range instrumentation engineering, range safety, flight hardware engineering, and mission operations support (NASA, 2010b).

1.1.2 Environmental Management System

NASA is committed to carrying out its research and projects at WFF in an environmentally sustainable manner. The Wallops Environmental Office (Code 250) ensures that the facility obtains the appropriate environmental permits, prepares documentation for compliance with NEPA and other environmental regulations and EOs, conducts employee and supervisor training, and implements the facility's Environmental Management System (EMS). WFF's EMS is a coherent, integrated approach to environmental management. WFF manages environmental risks through the application of the WFF EMS, which covers such topics as pollution prevention, energy and water management, maintenance of natural (green) infrastructure, and sustainable building practices (NASA, 2010b).

1.1.3 Site Location

WFF is located in the northeastern portion of Accomack County, Virginia, on the Delmarva Peninsula, and is comprised of the Main Base, Wallops Mainland, and Wallops Island (Figure 1-1). The Main Base is located off Virginia Route 175, approximately 3.2 kilometers (2 miles) east of U.S. Route 13 and is comprised of approximately 720 hectares (1,800 acres). It is bordered on the east by extensive marshland and creeks which lead into Chincoteague Bay and Chincoteague Inlet; on the north and west by Little Mosquito Creek, an estuarine area; and on the south and southeast by State Routes 175 and 798, respectively.

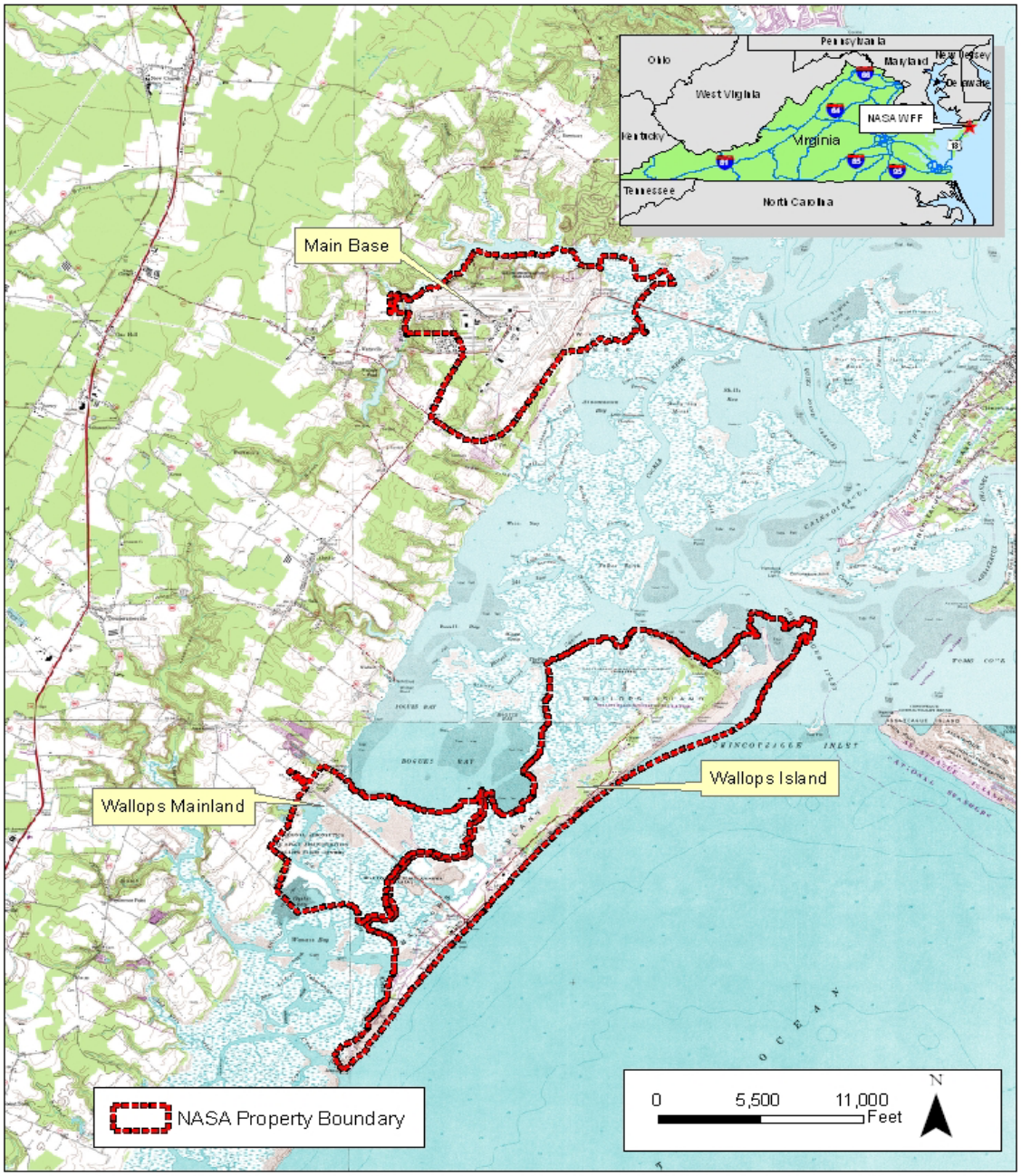

Figure 1-1: WFF landmasses

1.2 Background

1.2.1 Wallops Flight Facility Main Base Main Entrance

The main entrance into WFF consists of a single inbound traffic lane and a single outbound traffic lane, a guard house (Building N-126), a vehicle inspection lane, a badge office (Building N-127), two truck inspection lanes, and employee and badge office parking lots (Figure 1-2). The guard house is 41 square meters (m^2) (446 square feet [ft^2]) and the badge office is 247 m^2 (2,662 ft^2). The badge office parking lot has 16 regular spaces and 2 handicapped spaces and the security personnel parking lot has 14 spaces and no handicapped spaces. The entire main entrance footprint encompasses 0.6 hectares (1.5 acres).

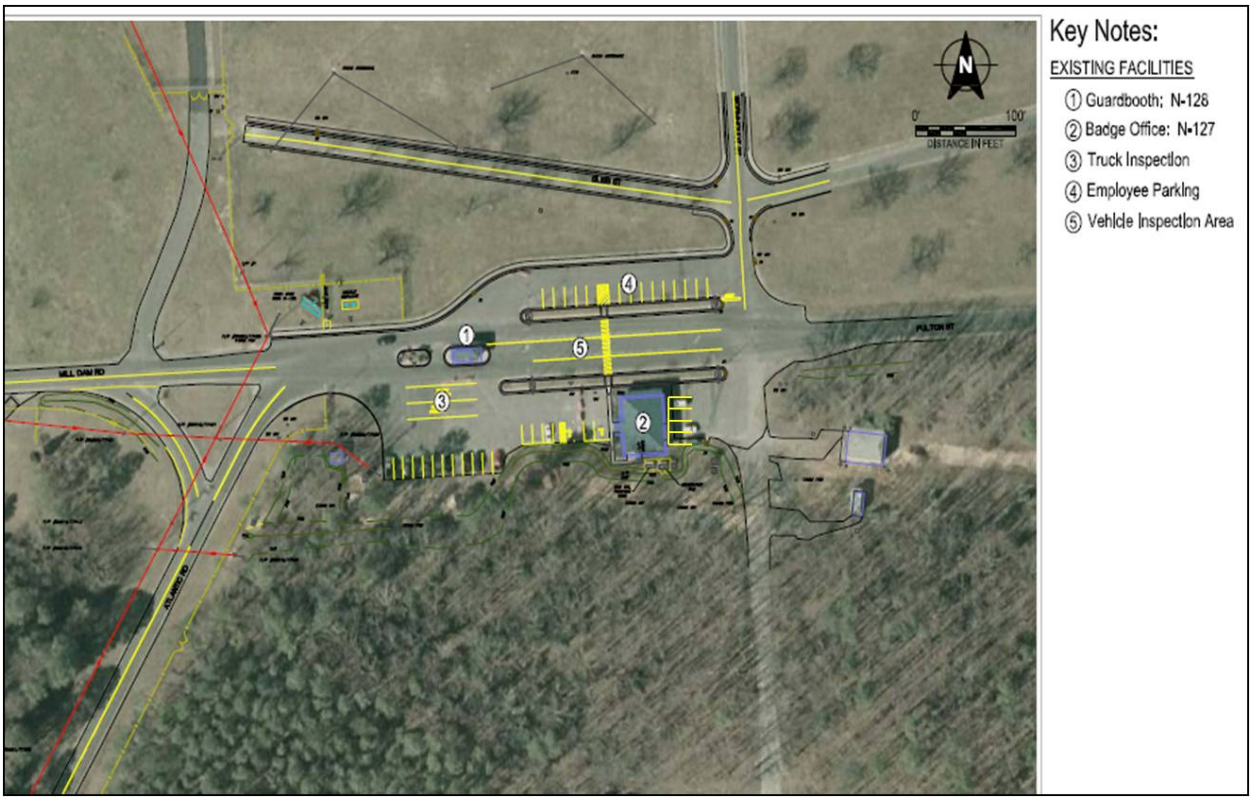

Figure 1-2: WFF main entrance existing conditions

1.3 Purpose and Need for the Proposed Action

1.3.1 Purpose

The purpose of the Proposed Action is to separate vehicles, trucks, and people to increase personnel safety and decrease congestion at the main entrance to WFF.

1.3.2 Need

The Proposed Action is needed because there are multiple substantial safety, security, and logistical risks associated with the continued use of the main entrance in its current configuration. Below is a discussion of the risks that would be mitigated by implementing the Proposed Action.

1.3.2.1 Safety Concerns: Risk Assessment Code Score

During its facility planning process, NASA assigns a Risk Assessment Code (RAC) score to each project as a means of prioritizing those that would remedy identified safety concerns. The RAC is a numerical expression of risk determined by an evaluation of both the potential severity of a condition and the probability of its occurrence. The following RAC Matrix considers the severity class and probability estimate of a situation to determine the final score.

SEVERITY CLASS	PROBABILITY ESTIMATE A	B	C	D	E
I	1	1	2	3	4
II	1	2	3	4	5
III	2	3	4	5	6
IV	3	4	5	6	7

Figure 1-3: RAC scoring matrix

Severity classifications are defined as follows:

- Class I – Catastrophic – A condition that may cause death or permanently disabling injury. Facility or systems destruction on the ground, or loss of crew, major systems, or vehicle during the mission.
- Class II – Critical – A condition that may cause severe injury or occupational illness, or major property damage to facilities systems or flight hardware.

- Class III – Moderate – A condition that may cause minor injury or occupational illness, or minor property damage to facilities, systems, or equipment.
- Class IV – Negligible – A condition that could require first aid treatment, though would not adversely affect personal safety or health, but is a violation of specific criteria.

Probability is the likelihood that an identified hazard will result in a mishap, based on an assessment of such factors as location, exposure in terms of cycles or hours of operation, and affected population. The probability estimates used for this RAC matrix are defined as follows:

- A – Likely to occur immediately
- B – Probably will occur in time
- C – May occur in time
- D – Unlikely to occur
- E – Improbable to occur

The RAC score can range from 1 to 7 with 1 representing immediate danger and 7 representing improbable. The reconfiguration of the main entrance to WFF scored a 3 using the RAC matrix, with a Class II severity classification (critical) and a probability estimate of C (may occur in time).

The safety issues identified that supported a RAC score of 3 were as follows:

- Security personnel must cross several lanes of active traffic to access the employee parking area;
- Truck inspection lanes are located within the badge office parking lot which is also used by visitors requiring temporary badges or employees dealing with badging issues; and
- Numerous transportation hazards have manifested due to a substantial increase in vehicular and delivery truck traffic.

The current main entrance is the chokepoint for goods and services passing in and out of WFF. With the continuing increase in activities, the potential exists that someone will get severely injured at this location due to the adverse mix of multiple security functions and increased traffic flow. Accordingly, NASA determined that a RAC Score of 3 (IIC) justified the need for reconfiguration of the main entrance to WFF.

1.3.2.2 Badging & Inspection Requirements

NASA requires that all employees and visitors wear security badges at all times per NPR 1600.1, *NASA Security Program Procedural Requirements*. Every truck that enters the facility must

undergo a thorough inspection process and all personally owned vehicles (POVs) are subject to random inspections (NPR 1600.1 and 14 CFR part 1204, subpart 10). Visitors with an escort badge must have their POV inspected each time they enter the facility. Currently, all inspections are conducted immediately adjacent to the main entrance, which presents a safety risk to WFF security personnel and those persons having their vehicles inspected, while also compounding the effects of slowing ingress and egress in an already congested area.

1.3.2.3 Increased Use of Main Entrance and Badge Office

In recent years there has been a marked increase in the amount of vehicular traffic around the main entrance to WFF as well as an increased utilization of the badge office for the processing of temporary badge requests (Figures 1-4 and 1-5). During peak hours the badge office can become overcrowded, forcing visitors to wait in a line that extends out of the badge office into the parking lot. The number of delivery trucks and required truck inspections has also followed this trend. The resultant increased congestion has created unsafe conditions at the main entrance to WFF. Visitors are forced to double and even triple park to accommodate their vehicles during badge pick-up (Figure 1-6). In the referenced photograph, truck inspections are being conducted, pedestrians are weaving around cars, and vehicles are having difficulty maneuvering through the congested lot.

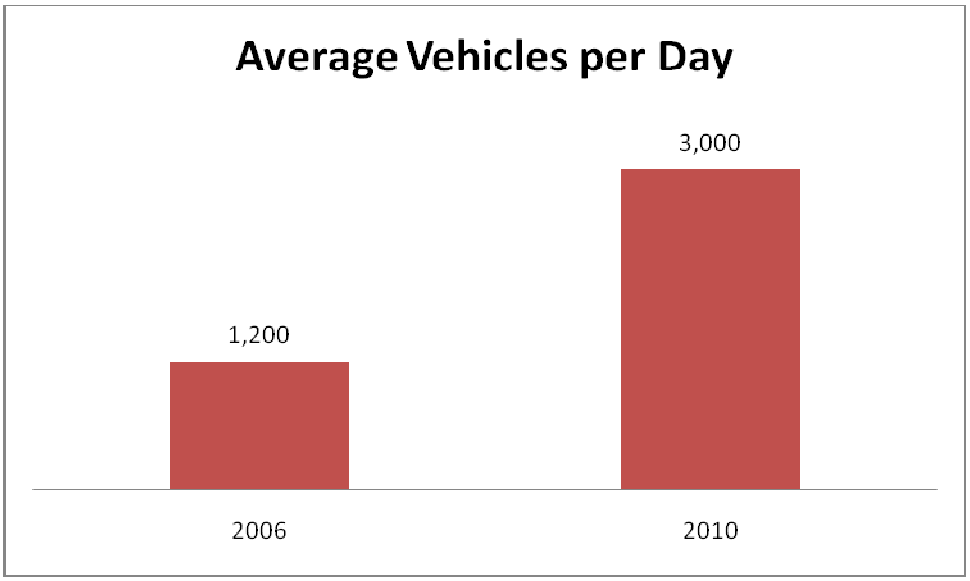

Figure 1-4: 150 percent increase in vehicular traffic at WFF main entrance

Figure 1-5: Nearly 140 percent increase in temporary badge requests at WFF

Figure 1-6: Badge office parking lot

1.3.2.4 Multiple Operations

The layout of the existing complex is unsafe because it lacks the space needed for multiple operations. There are two truck inspection lanes within the confines of the same parking lot that

is used by all visitors and employees to obtain badges. On many days, several trucks are stacked up waiting for inspection, making the remainder of the lot either unusable or difficult to navigate for those utilizing the badge office (Figure 1-7).

Figure 1-7: Trucks overflowing the inspection lanes

1.3.2.5 Parking Lots

Security personnel stationed at the guard house or badge office are required to park in a small parking lot just northeast of the guard house. Employees must cross several lanes of traffic at the highly congested main entrance to WFF several times a day, creating a safety hazard. Additionally, with only 14 spaces and no handicapped spaces, the current parking lot cannot accommodate all employee POVs and government owned vehicles (GOVs) used during work hours. Security personnel are often forced to double park in an even smaller lot directly behind the badge office (Figure 1-8).

Figure 1-8: Double parking behind existing badge office (N-127)

The parking lot in front of the badge office has 16 regular spaces and 2 handicapped spaces. The recent increase in visitors combined with expected growth into the foreseeable future leaves the parking lot in front of the badge office unable to handle the demand.

To further complicate the current conditions, visitors needing to exit the badge office parking lot and travel to Wallops Island must make a maneuver across two traffic lanes and a turn lane with obscured sightlines due to the location of the truck inspection lanes and the existing guard house.

1.3.2.6 Inclement Weather Conditions and Delayed Openings

The current badge office is 247 m^2 (2,662 ft^2). The number of visitors requiring temporary badges has increased to the point where the badge office is often past maximum capacity. During peak hours the line for temporary badges can extend out of the door of the badge office into the parking lot, leaving visitors exposed to inclement weather conditions. This situation will likely only worsen over time.

WFF employees and visitors are subject to random vehicle inspections. While their POV is being inspected by security, they must stand outside, regardless of weather. Inspection can occur any time of day or night and there is no lighting for conducting nighttime inspections.

There is a single inbound lane and single outbound lane leading to and from the main entrance to WFF. Two roads, Atlantic Road and Mill Dam Road, merge into one inbound lane via a "Y" intersection at the main entrance to WFF. When WFF experiences a delayed opening (e.g., due

to inclement weather conditions) the traffic (i.e., employees, visitors, trucks) on both Atlantic and Mill Dam Roads can become significantly backed up. Delayed openings increase congestion at the main entrance to WFF because employees who normally filter in over a few hours are now all entering at once; all visitors are utilizing the badge office in the same time frame; and the queued trucks all require inspection. This influx of vehicular and pedestrian traffic can create a safety hazard when the inbound traffic lane and badge office parking lot become too full to accommodate the entering cars and trucks.

1.3.2.7 Shipping and Receiving

WFF shipping (Building D-049) and receiving (Building F-019) buildings are currently located well within the interior of the Main Base (Figure 1-9). All trucks carrying supplies to WFF must first be inspected at the main entrance before being allowed to proceed to shipping and/or receiving. Relocating the shipping and receiving facilities to a location outside of the WFF fence would mitigate such potential security risks as allowing large trucks access to the interior of the Main Base while also reducing inspection-related congestion at the main entrance.

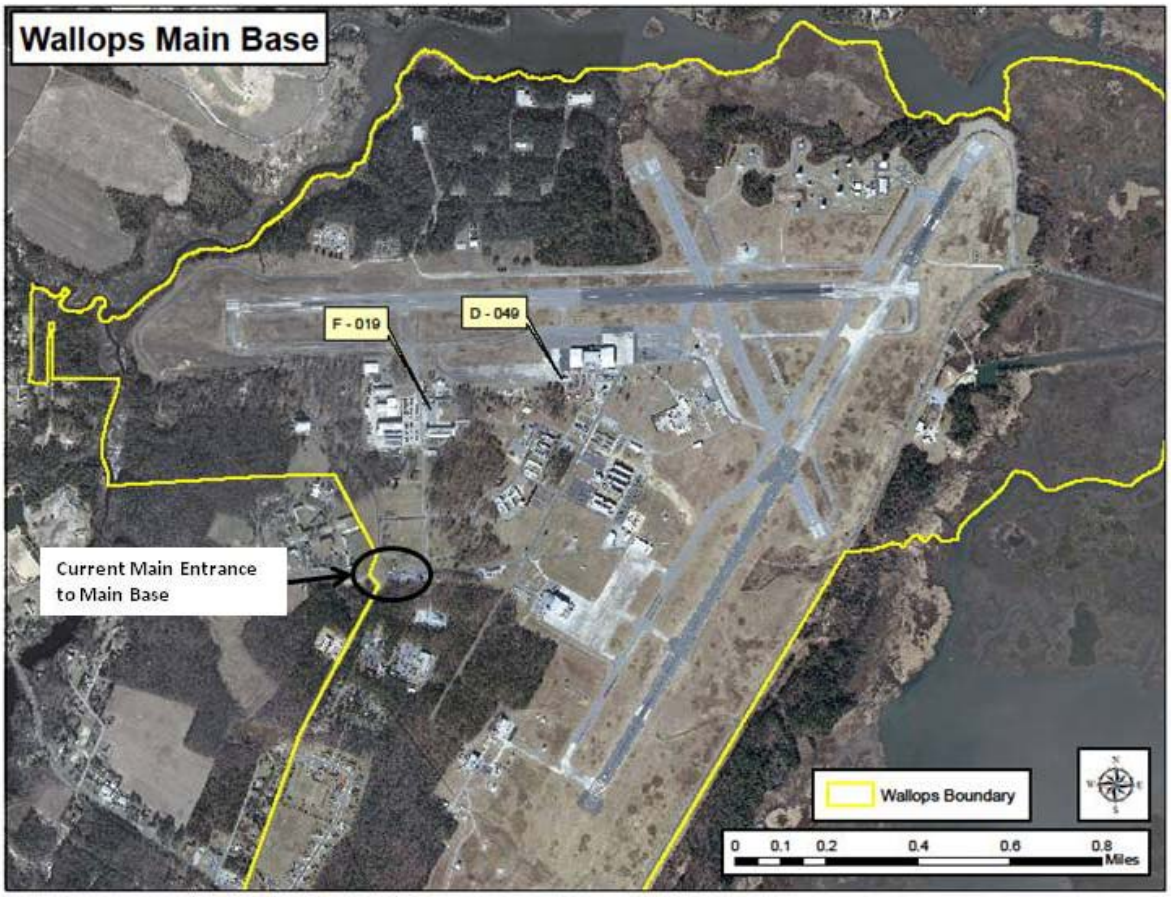

Figure 1-9: Location of WFF Shipping (D-049) and Receiving (F-019) buildings well within the interior of the property boundary

2 Proposed Action and Alternatives

2.1 Introduction

This section provides a detailed discussion of the alternatives under consideration for the reconfiguration of the main entrance to WFF. The No Action Alternative and two Action Alternatives are evaluated in this EA.

2.2 No Action Alternative

Under the No Action Alternative the main entrance to WFF would not be reconfigured and the existing (and expected increase in) issues of personnel safety and traffic congestion would remain. Figure 1-2 depicts the current main entrance configuration which would not change under the No Action Alternative.

2.3 Alternatives Screening Process

NASA initially performed a high-level concept study for the reconfiguration of the Main Entrance to the Main Base (TranSystems, 2010). Nine different redesign concepts were created. Figure 2-1 is an example of one of those nine designs. The numerous redesign concepts had only slight variations among them, with the main difference being the location of the truck inspection area. Minor differences included location and size of the parking lots, guard house location, and intersection design. Design concepts 1 through 5 were considered undesirable due to the need for hiring additional staff to oversee a separate truck inspection area; concepts 6, 7, and 9 did not adequately separate trucks from cars. Additionally, many of the redesign concepts did not sufficiently alleviate congestion at the main entrance due to a complex reconfiguration of incoming and outgoing traffic lanes. Together, the WFF Facilities Management Branch and Protected Services Division determined that redesign option 8 (Figure 2-2) was the best general configuration to meet all the needs of the project as it was the only option that moved the badge office from its current location. Redesign option 8 was then used as the starting concept for what ultimately became the Action Alternatives that are evaluated in detail in this EA.

2.4 Proposed Action/Preferred Alternative

The Proposed Action, NASA's preferred alternative, would involve either a two-phased or four-phased construction process, described in detail below. The number of phases would be directly related to available funding, however, the two-phased process would be preferred as all safety concerns would be addressed in the first phase. The four-phased option would not address all safety concerns (i.e., separating trucks from other vehicles) until final buildout.

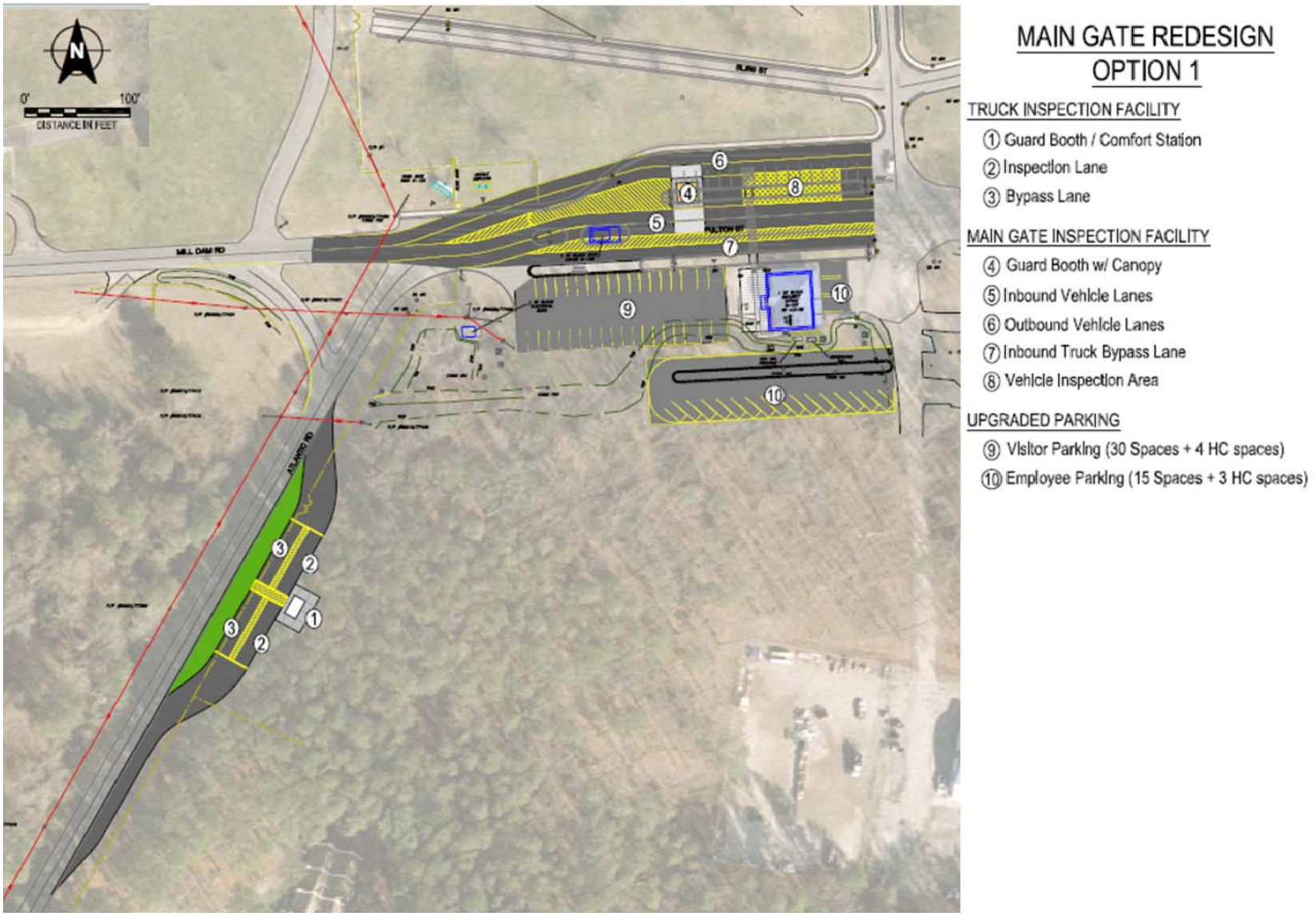

Figure 2-1: Example of 1 of the 9 redesign options considered during the initial concept study

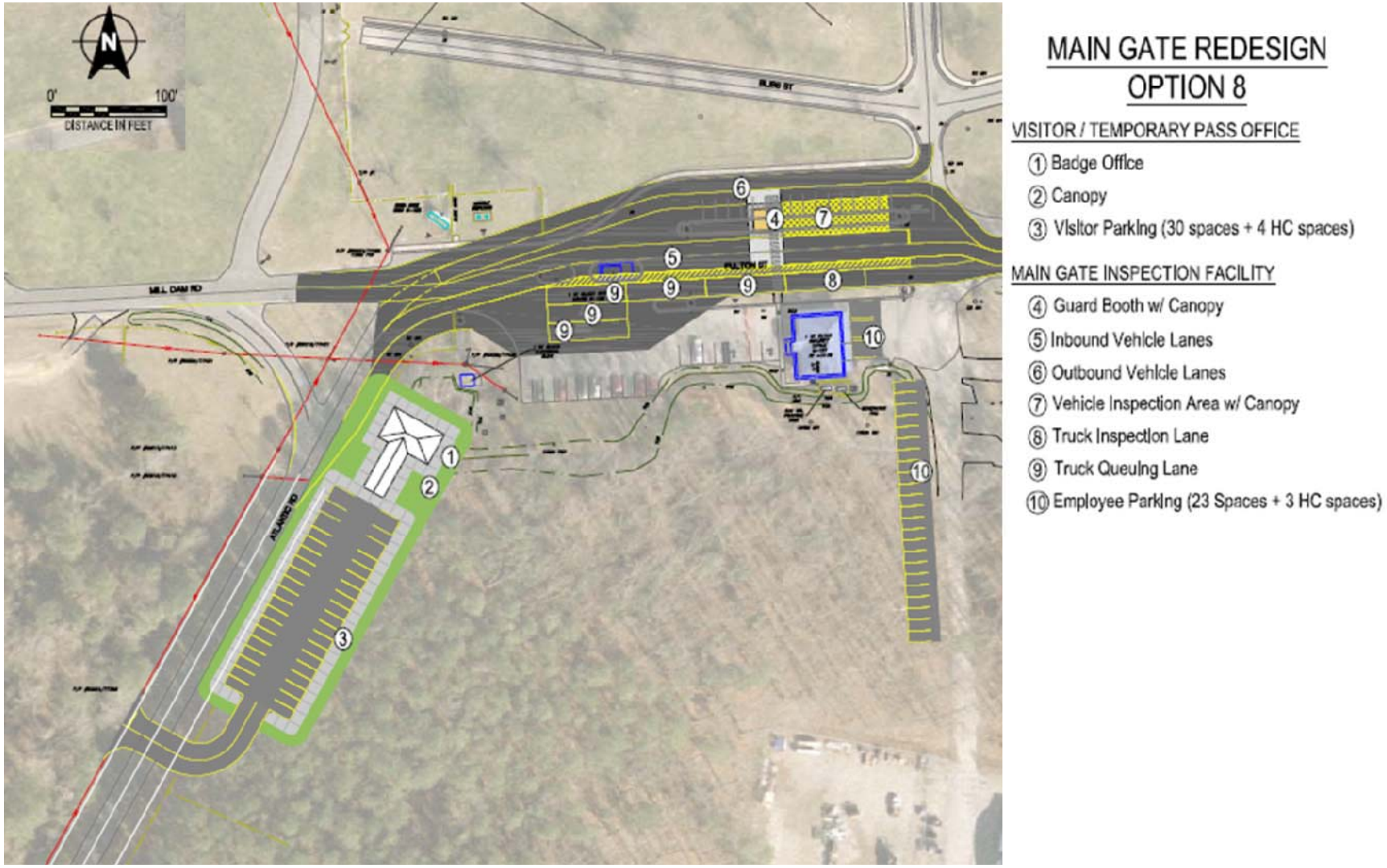

Figure 2-2: Redesign option 8, used as the initial concept for development of the Action Alternatives analyzed in this EA

2.4.1 Preferred Alternative, Two-Phased Approach

2.4.1.1 Phase I

The first phase of the project would involve construction of a new badge office with an extended canopy and paving a larger badge office parking lot and truck inspection lot in a currently forested area just south of the current location on Atlantic Road (Figure 2-3). Left and right-hand turn lanes would be constructed near the entrance to the badge office's parking lot on Atlantic Road. Phase I would also include additional security personnel parking south of the current badge office.

Figure 2-3: Preferred Alternative two-phased approach, phase I

Badge Office and Parking Lot

Employees at the current badge office perform multiple functions including temporary and permanent badge issuance, fingerprinting, and personal identity verification. The badge office also houses supervisory employees. During peak hours the badge office can become overcrowded, forcing visitors to wait in a line that extends out of the badge office into the parking lot.

The new badge office would only have one function: the issuance of temporary badges. The remaining functions would still be carried out in the old badge office. Streamlining temporary

badge issuance would increase efficiency; however, if there was an instance where visitors were forced to wait in a line that extended into the parking lot, the entrance would be covered by a canopy, providing protection from inclement weather.

The current badge office parking lot has 16 regular spaces and 2 handicapped spaces, which is not sufficient for the number of visitors using the parking lot on a daily basis. Its current location creates obscured sightlines for visitors needing to exit this parking lot and travel to Wallops Island and forces them to make an unsafe maneuver across 2 traffic lanes and a turn lane.

Additionally, visitors who receive escort badges may leave their car in the badge office parking lot for the duration of their visit, resulting in even fewer unoccupied spaces available for other visitors.

The new badge office parking lot would have up to 52 regular spaces and 4 handicapped spaces to better accommodate visitors. Its location on Atlantic Road would eliminate the need for visitors to perform the unsafe maneuver of crossing 2 traffic lanes and a turn lane with obscured sightlines if traveling to Wallops Island. For those entering the badge office parking lot from Atlantic Road, the addition of left and right hand turn lanes would also provide a safe means of entering the parking lot and truck inspection area.

Truck Inspection Lanes

There are currently two truck inspection lanes located within the confines of the already overcrowded badge office parking lot. Additional trucks cannot safely maneuver within the parking lot due to space limitations and are forced to block the parking lot entrance for other vehicles when the inspection lanes are occupied (Figure 1-7).

The new truck inspection lanes would be part of a separate lot adjacent to the new badge office parking lot (Figure 2-3). This design accommodates more trucks, provides ample room for maneuvering, and provides a way of keeping the trucks separated from other vehicles. An additional security post would be added to cover truck inspections at the new location.

Security personnel Parking

The current security personnel parking lot is located just northeast of the guard house. It has 14 regular spaces and no handicapped spaces. There are not enough parking spaces for security personnel POVs or GOVs (used during work hours), resulting, on most days, in a double parking situation behind the current badge office (Figure 1-8). Additionally, the security personnel have to cross both inbound and outbound traffic lanes several times per day in order to get to the badge office, creating a safety hazard.

The new security parking lot would have up to 30 spaces and 4 handicapped spaces to better accommodate both POVs and GOVs of the security personnel. A new sidewalk would provide a

safe walkway to the new badge office so security personnel would no longer have to cross traffic lanes several times per day. Security would be maintained by placing a locked gate or turnstile at the fence line north of the new badge office.

2.4.1.2 Phase II/Final Buildout

The final buildout of the Preferred Alternative under the two-phased approach would likely be several years later, dependent upon available funding, and would include a new guard house and canopy, reconfiguration of the intersection with Atlantic and Mill Dam Roads, movement of the truck inspection lanes to an area adjacent to the new guard house, and construction of a new Shipping and Receiving Facility adjacent to the badge office (Figure 2-4).

Figure 2-4: Preferred Alternative two-phased approach, phase II/final buildout

Guard House

The current guard house area provides no inclement weather protection or nighttime lighting to employees or visitors who have their vehicles inspected.

The current guard house would be demolished and the new guard house would have a large canopy to provide inclement weather protection to employees and visitors as well as the security

personnel conducting the inspections. Nighttime lighting would also be added to make inspections conducted after dark safer.

Intersection Reconfiguration

There is currently one inbound traffic lane and one outbound traffic lane at the main entrance to WFF. The inbound single lane merges traffic from Mill Dam and Atlantic Roads via a "Y" intersection before reaching the main entrance. The main road into the Main Base is Mill Dam, which empties east bound traffic from Route 175. Vehicles on Atlantic Road must yield to Mill Dam Road traffic. The single outbound lane supports all traffic exiting the Main Base.

The final buildout of the two-phased approach would replace the 'Y' intersection with a roundabout. Roundabouts, used in place of stop signs and traffic signals, are a type of circular intersection that can significantly improve traffic flow and safety (Figure 2-5). Roundabouts force drivers to slow down and travel in the same direction. Where roundabouts have been installed, motor vehicle crashes have declined by about 40 percent, and those involving injuries have been reduced by about 80 percent. Because roundabouts improve the efficiency of traffic flow, they also reduce vehicle emissions and fuel consumption (Insurance Institute for Highway Safety, 2010).

The addition of the roundabout would coincide with increasing the single inbound and outbound lanes to dual lanes, eliminating the need for traffic to merge from the incoming Mill Dam and Atlantic Roads, which would improve safety and increase vehicle throughput.

Figure 2-5: Typical roundabout

Truck Inspection Lane Reconfiguration

The current main entrance has two truck inspection lanes located within the badge office parking lot. There are no lanes available to queue trucks that are waiting to be inspected which can lead to traffic congestion when trucks are forced to queue in the available badge office parking lot spaces.

Phase I of the Preferred Alternative two-phased approach as discussed above would create a truck inspection lot adjacent to the new badge office parking lot. Upon final buildout of the two-phased approach of the Preferred Alternative, this truck inspection lot would become a part of the proposed Shipping and Receiving Facility and truck inspections may be conducted at the main entrance of WFF. If truck inspections are moved back up to the guard house area at the entrance to the Main Base, trucks would still be significantly separated from cars because the majority of delivery trucks would go to the new Shipping and Receiving Facility. Only trucks carrying unique cargo (e.g., scientific payloads) would travel onto the Main Base to make their delivery. Trucks carrying unique cargo to Wallops Island would be inspected by the officers at the gate located on Wallops Mainland and would not be required to undergo inspection at the Main Base entrance.

The final buildout of the two-phased approach would create 5 truck queuing lanes and 1 truck inspection lane to better accommodate the trucks entering WFF.

Shipping and Receiving Facility

The current shipping and receiving buildings are located inside the Main Base (Buildings D-049 and F-019) (Figure 1-9) allowing trucks to travel well within the fence line of the Main Base for unloading at Building F-019.

The new Shipping and Receiving Facility would be approximately 2,800 m^2 (30,000 ft^2) and would be one consolidated facility located near the perimeter of the WFF boundary (Figure 2-4). Trucks would enter the unloading area from Atlantic Road, back up to the building and unload their cargo. Once inside the building the cargo would be inspected before being loaded onto NASA owned trucks for delivery throughout WFF. This would greatly reduce the number of truck inspections and increase security by preventing a large number of trucks from gaining access to the interior of the Main Base. Trucks would also be loaded with outgoing shipments at this location.

2.4.2 Preferred Alternative, Four-Phased Approach

Another option for the Preferred Alternative would be to complete the project in four phases. Phase I would be identical to the Preferred Alternative two-phased approach phase I, except that there would not be a truck inspection lot (Figure 2-6). The remaining phases through the final buildout, once completed, would exactly mimic the Preferred Alternative two-phased approach at final buildout. Below is a detailed discussion of how the phasing would occur.

Figure 2-6: Preferred Alternative four-phased approach, phase I

2.4.2.1 Phase I

The first phase would entail building a new badge office with extended canopy and paving a larger badge office parking lot in a currently forested area just south of the current location on Atlantic Road (Figure 2-6). Additionally, left and right-hand turn lanes would be added near the entrance to the badge office's parking lot on Atlantic Road. Finally, a larger security personnel parking lot would be constructed with a sidewalk and gate connecting it to the new badge office (Figure 2-6).

The design and functionality of the new badge office, visitor parking, turn lanes, and security parking areas would remain the same as those previously described in the Preferred Alternative two-phased approach.

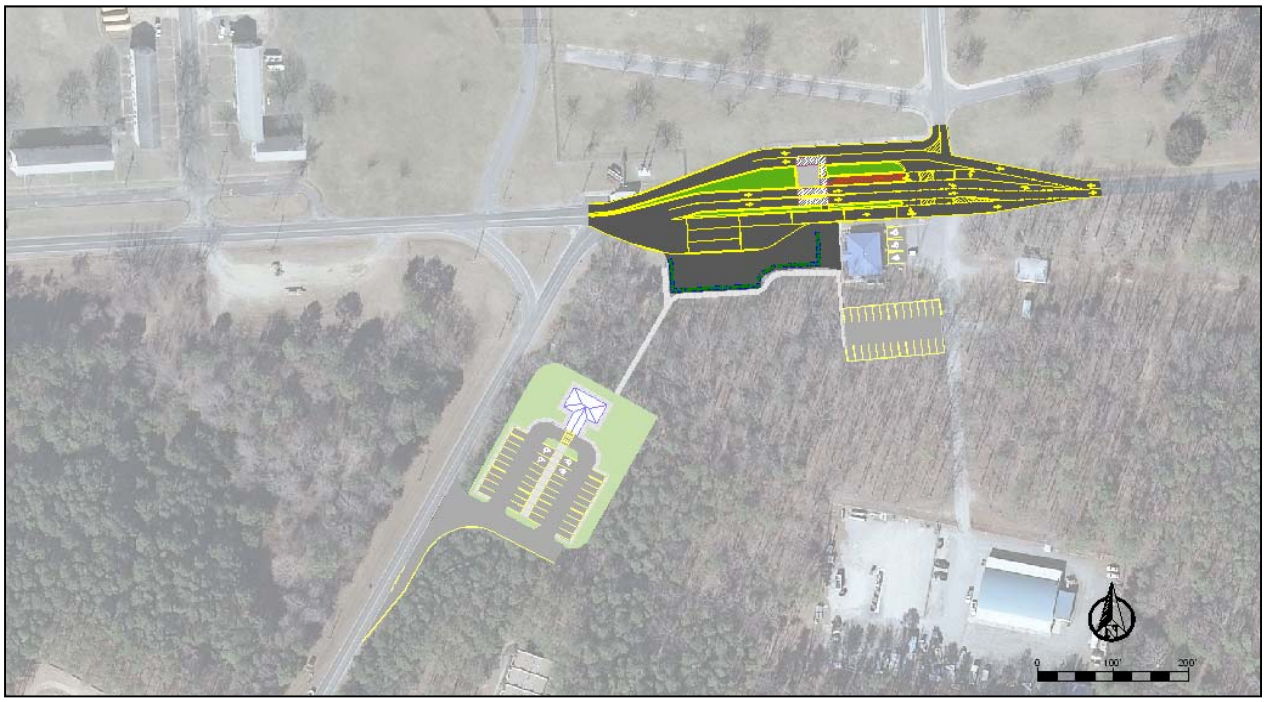

Figure 2-7: Preferred Alternative, four-phased approach, phase II

2.4.2.2 Phase II

The second phase would involve the demolition of the existing guard house, construction of a new guard house with canopy, and increasing the number of truck queuing lanes and truck inspection lanes (Figure 2-7). The design and functionality of the guard house and truck queuing and inspection lanes would remain the same as those previously described in the Preferred Alternative, two-phased approach.

Additionally, the existing inbound and outbound single lanes would be expanded into dual lanes. There is currently one inbound traffic lane and one outbound traffic lane at the main entrance to

WFF. The inbound single lane merges traffic from Mill Dam and Atlantic Roads before reaching the main entrance. The single outbound lane supports all traffic exiting the Main Base.

Making the single inbound traffic lane a dual lane would eliminate the need for traffic to merge from the incoming Mill Dam and Atlantic Roads while improving safety and increasing vehicle throughput. Increasing the single outbound lane to two lanes would also decreases the amount of time required to exit the Main Base which would be beneficial in case of an emergency that would require mass exodus.

The proposed roundabout addition in the Preferred Alternative, four-phased approach, phase III would work synergistically with the dual inbound and outbound lanes.

Figure 2-8: Preferred Alternative, four-phased approach, phase III

2.4.2.3 Phase III

The third phase of the four-phased option would add a roundabout at the current merging point of Atlantic and Mill Dam roads (Figure 2-8). The design and functionality of the roundabout would remain the same as previously described in the Preferred Alternative, two-phased approach.

Figure 2-9: Preferred Alternative, four-phased approach, phase IV/final buildout

2.4.2.4 Phase IV/Final Buildout

The final phase would involve the construction of a new Shipping and Receiving Facility adjacent to the new badge office on Atlantic Road (Figure 2-9).

The design and functionality of the Shipping and Receiving Facility would remain the same as previously described in the Preferred Alternative, two-phased approach.

2.5 Alternative One

Alternative One is also composed of four phases. The major difference between Alternative One and either of the Preferred Alternative options is the location of the new badge office and parking lot, which would be located approximately 0.9 kilometers (0.6 miles) south on Atlantic Road, west of the existing U.S. Coast Guard family housing, near the intersection of Route 175 and Atlantic Road (Figures 2-10 and 2-11). This location is under consideration because of its higher public visibility from Route 175 and its greater geographic distance from the main entrance. Phase I would be similar to the first phase of the Preferred Alternative, two-phased approach, with a few minor differences, including additional parking spaces and truck queuing and inspection lanes located behind the badge office in a wrap-around configuration (Figure 2-12). The new employee parking lot would be paved in the same location as in either of the Preferred Alternative options (Figure 2-13).

Figure 2-10: Alternative One badge office site, facing east

Figure 2-11: Area directly across from Alternative One badge office site showing proximity to residential homes and the intersection of Route 175 and Atlantic Road

2.5.1 Phase I

The first phase of Alternative One would involve the construction of a new badge office, with an extended canopy on each side, and larger badge office parking lot in an open field in the southwest corner of the NASA property adjacent to Atlantic Road (Figure 2-12).

Additionally, left and right-hand turn lanes would be added near the entrance to the badge office's parking lot on Atlantic Road. Truck queuing and inspection lanes would be paved adjacent to and behind the badge office parking lot. A larger security personnel parking lot would also be constructed adjacent to the old badge office.

Figure 2-12: Alternative One, phase I-proposed badge office and truck inspection area

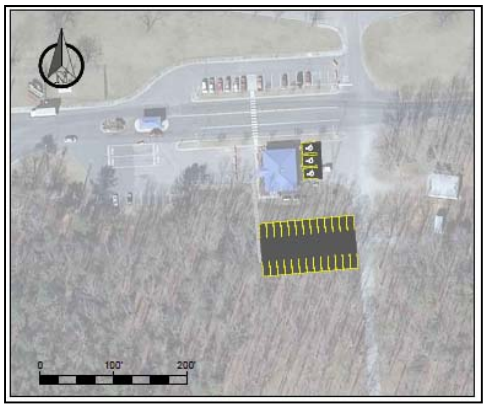

Figure 2-13: Alternative One, phase I- proposed employee parking lot

The design and functionality of the new badge office, badge office parking, turn lanes, and security parking areas would remain the same as those described under the Preferred Alternative two-phased approach, however, due to distance there would be no sidewalk and gated entrance connecting the new security personnel parking lot with the new badge office (Figure 2-14). Employees working at the old badge office (N-127) would park in the new employee parking lot and those employed at the new badge office's parking lot which would have 2 additional regular parking spaces in comparison to the Preferred Alternative options.

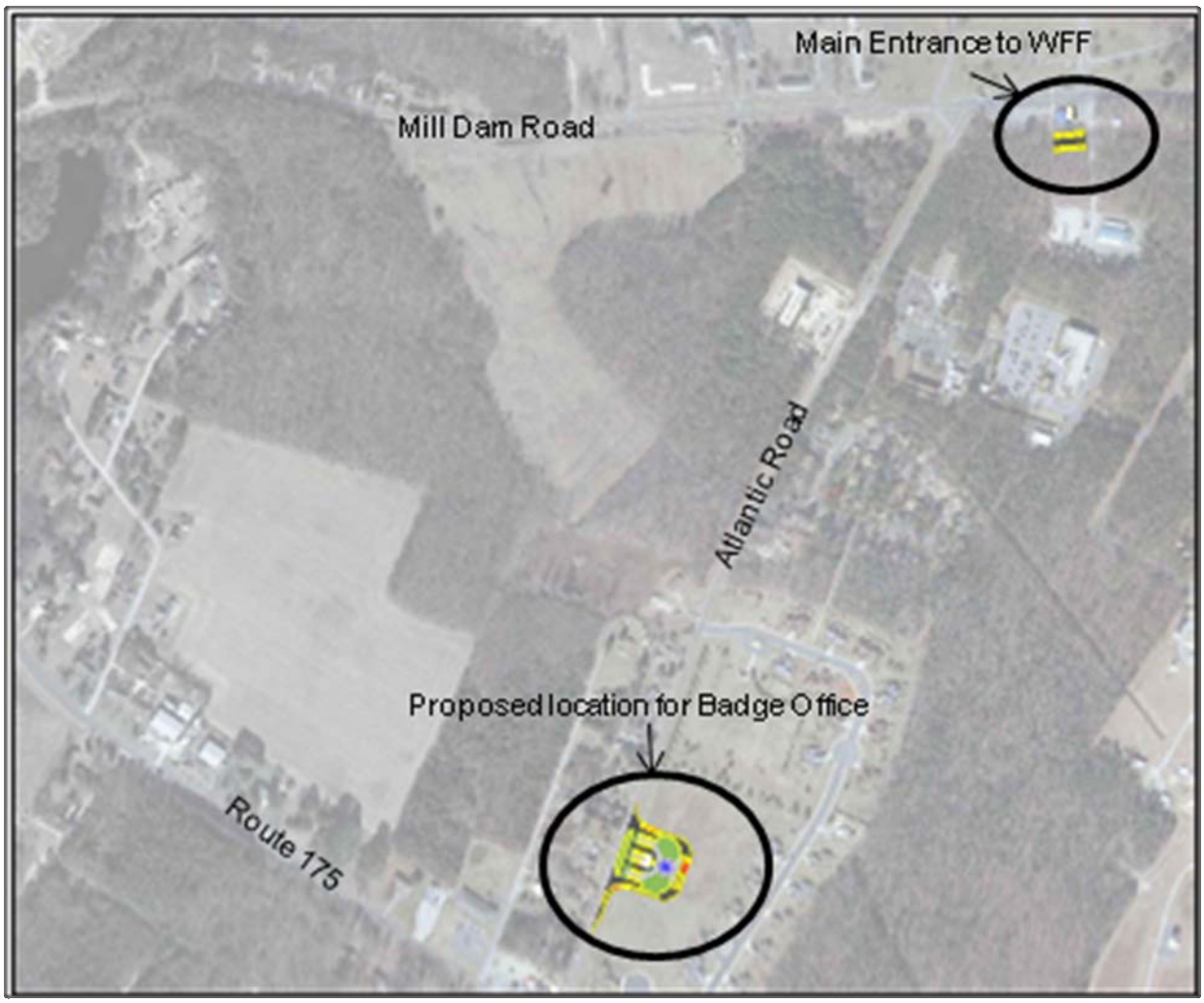

Figure 2-12: Alternative One badge office in reference to WFF main entrance

2.5.2 Phase II

The second phase of Alternative One would entail the demolition of the current guard house, construction of a new guard house with canopy, an increase in the number of truck queuing lanes and truck inspection lanes, and would expand the existing inbound and outbound single lanes into dual lanes (Figure 2-15).

The design and functionality of these project components would exactly mimic phase II of the Preferred Alternative, four-phased approach.

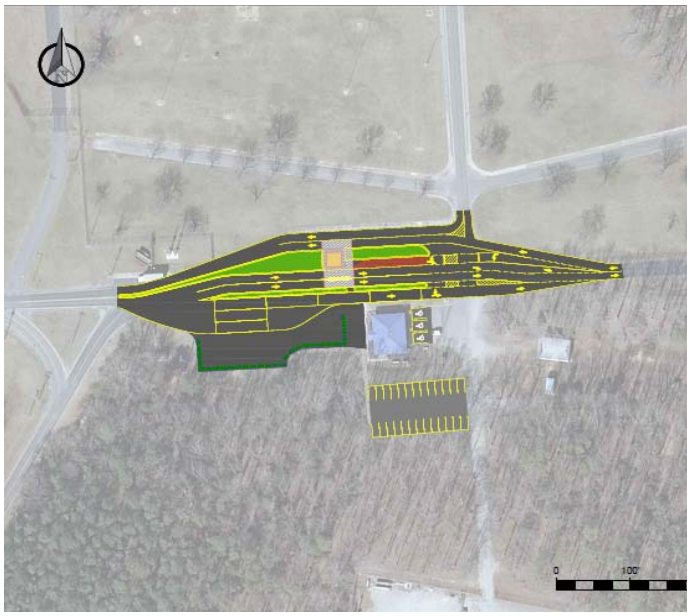

Figure 2-13: Alternative One, phase II

2.5.3 Phase III

The third phase of Alternative One would add a roundabout at the current merging point of Atlantic and Mill Dam roads (Figure 2-16).

The design and functionality of the roundabout would remain the same as described under the Preferred Alternative, two-phased approach.

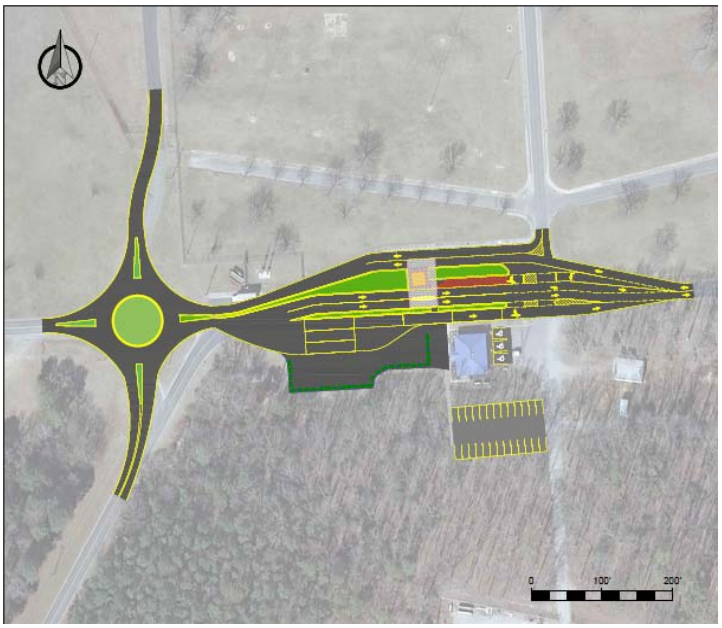

Figure 2-14: Alternative One, phase III

2.5.4 Phase IV/Final Buildout

The final phase of Alternative One would involve the construction of a new Shipping and Receiving Facility just south of the current main entrance to WFF on Atlantic Road (Figure 2-17). In this configuration, the Shipping and Receiving Facility would not be adjacent to the new badge office.

The design and functionality of the Shipping and Receiving Facility would remain the same as previously described in the Preferred Alternative, two-phased approach.

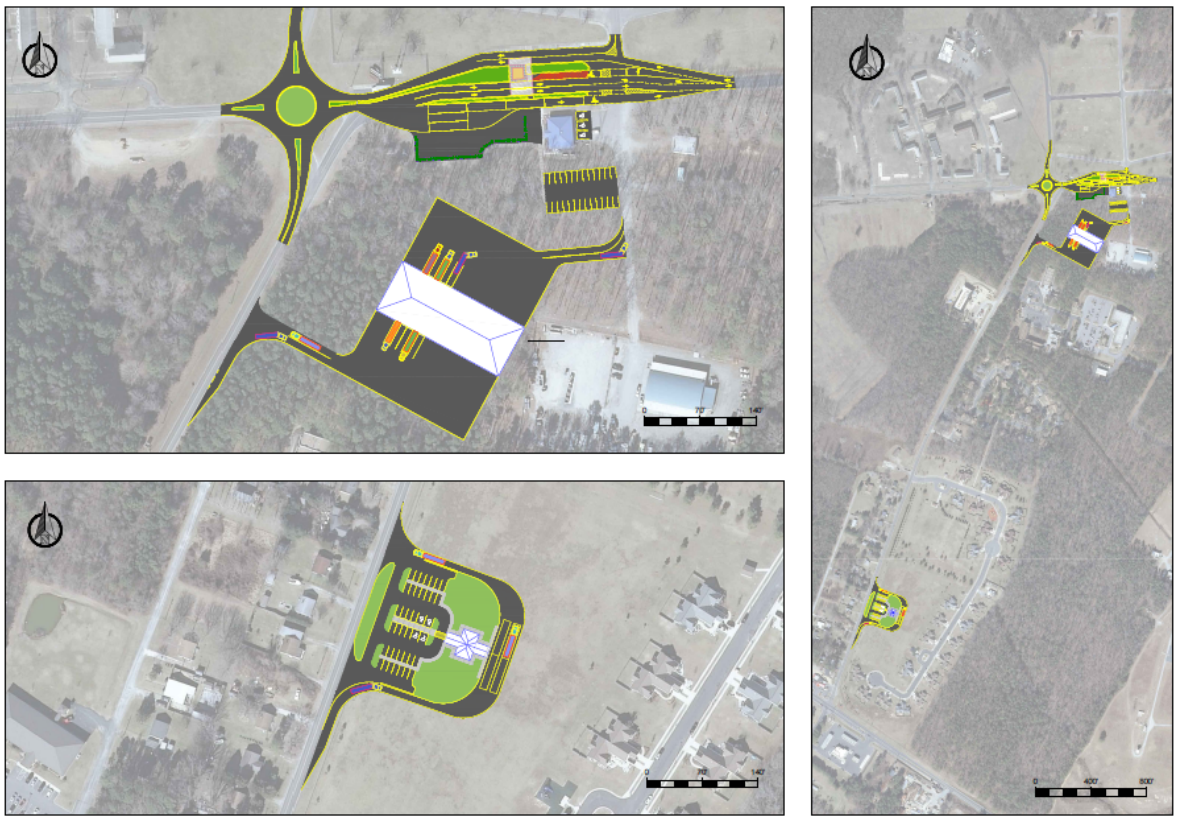

Figure 2-15: Alternative One, phase IV/final buildout

2.6 Comparison Summary for Each Action Alternative

The major differences in construction between the Action Alternatives are the amount of impervious surface added, trees removed, and estimated time for construction for each phase. The table below compares each of these aspects individually and presents combined totals for each Action Alternative parameter.

Table 2-1: Comparison summary for Action Alternatives

Preferred Alternative (two-phased)	Impervious Surface Added	Trees Removed	Time[1] (months)
Phase I	0.76 hectares (1.88 acres)	0.83 hectares (2.06 acres)	6
Phase II	0.57 hectares (1.42 acres)	0.57 hectares (1.42 acres)	12
Combined Total	1.33 hectares (3.3 acres)	1.40 hectares (3.48 acres)	**18**
Preferred Alternative (four-phased)	Impervious Surface Added	Trees Removed	Time (months)
Phase I	0.42 hectares (1.05 acres)	0.50 hectares (1.23 acres)	6
Phase II	none	none	6
Phase III	Negligible over existing	none	4
Phase IV	0.88 hectares (2.18 acres)	0.88 hectares (2.18 acres)	12
Combined Total	1.30 hectares (3.23 acres)	1.38 hectares (3.41 acres)	**28**
Alternative One	Impervious Surface Added	Trees Removed	Time (months)
Phase I	0.64 hectares (1.57 acres)	0.09 hectares (0.22 acres)	9
Phase II	none	none	6
Phase III	Negligible over existing	none	6
Phase IV	0.96 hectares (2.38 acres)	0.96 hectares (2.38 acres)	12
Combined Total	1.54 hectares (3.95 acres)	1.05 hectares (2.60 acres)	**33**

[1]Estimated time required (in months) to complete each phase

3 Description of the Affected Environment and Environmental Consequences

NEPA requires focused analysis of the areas and resources potentially affected by an action or alternative. The results of the analysis should be presented in a comparative fashion that allows decision makers and the public to differentiate among the alternatives.

CEQ regulations for implementing NEPA (40 CFR Parts 1500-1508) also require the discussion of impacts in proportion to their significance, with only enough discussion of non-significant issues to show why more study is not warranted. The analysis in this EA considers the current conditions of the affected environment and compares those to conditions that might occur should WFF implement either of the Alternatives.

Affected Environment

The affected environment for this EA includes the area at and adjacent to the current main entrance to the WFF Main Base, and serves as the baseline against which the Alternatives are evaluated.

Only environmental resources that may be impacted by the Alternatives are analyzed in detail. A complete description of all other WFF resource areas is available in the Site-wide EA or the 2008 WFF Environmental Resources Document (ERD).[2]

Resources Carried Forward for Detailed Analysis

Table 3-1 presents the results of the process of identifying resources to be analyzed in this EA. This assessment evaluates potential impacts to land use; geology and soils; coastal zone; stormwater; air quality; climate change; noise; hazardous materials and hazardous waste; vegetation; terrestrial wildlife and migratory birds; health and safety; cultural resources; transportation; and environmental justice.

Resources Considered but Eliminated from Detailed Analysis

Numerous resources (topography; groundwater; wetlands; floodplains, surface water; threatened and endangered species, marine mammals and fish; population; and employment and income) were assessed but warrant no further examination in this EA. NASA's rationale for eliminating resource areas from detailed study are presented in Table 3-1.

[2] 2008 WFF ERD is available upon request.

Table 3-1 Resources considered in the WFF Main Entrance Reconfiguration EA

Resource		Analyzed in Detail in this EA?	If *Yes*, EA Section If *No*, Rationale for Elimination
Physical Environment	Land Resources		
	Land Use	Yes	Section 3.1.1
	Soils	Yes	Section 3.1.2
	Topography	No	Topography would not change
	Water Resources		
	Coastal Zone	Yes	Section 3.2.1
	Stormwater	Yes	Section 3.2.2
	Groundwater	No	No additional groundwater usage
	Wetlands	No	No wetlands present in project area
	Floodplains	No	Project site elevation above floodplain
	Surface Water	No	No surface water present near project area
	Air Quality	Yes	Section 3.3
	Climate Change	Yes	Section 3.4
	Noise	Yes	Section 3.5
	Hazardous Materials and Hazardous Waste	Yes	Section 3.6
Biological Environment	Vegetation	Yes	Section 3.7
	Terrestrial Wildlife and Migratory Birds	Yes	Section 3.8
	Threatened and Endangered Species	No	No threatened or endangered species present near project area
	Marine Mammals and Fish	No	No in-water work proposed
Social and Economic Environment	Health and Safety	Yes	Section 3.9
	Transportation	Yes	Section 3.10
	Cultural Resources	Yes	Section 3.11
	Environmental Justice	Yes	Section 3.12
	Population	No	Minimal (≤ 2) new permanent employees hired to support proposed action
	Employment and Income	No	Minor short-term beneficial impacts during construction only

3.1 Land Resources

3.1.1 Land Use

3.1.1.1 Affected Environment

WFF is located in the northeastern portion of Accomack County, Virginia, on the Delmarva Peninsula. WFF is comprised of the Main Base, Mainland, and Wallops Island.

The Main Base encompasses 720 hectares (1,800 acres), which house offices, laboratories, maintenance and service facilities, a NASA-owned airport, air traffic control facilities, hangars, runways, and aircraft maintenance and ground support buildings. In addition, there are water and sewage treatment plants, rocket motor storage magazines, U.S. Navy administration and housing, as well as Coast Guard housing and other miscellaneous structures.

Rural residential land borders the Main Base to the southwest and small towns and businesses are scattered throughout this area. Horntown is located 4 kilometers (2.5 miles) north of the Main Base; Wattsville is located 1.6 kilometers (1 mile) to the west of the Main Base; and Atlantic is located 4.4 kilometers (2.75 miles) to the southwest of the Main Base. Each of these towns has a population of less than 500 people (NASA, 2008a). Area businesses include fuel stations, retail stores, markets, and restaurants.

The residential sites along Atlantic Road are located approximately 600 meters (1970 feet) from the Preferred Alternative site; U.S. Navy housing is located approximately 320 meters (1050 feet) north of the site. Alternative One is sited much closer to both residential and Coast Guard housing, approximately 91 meters (300 feet).

3.1.1.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no changes or impacts to land use.

Preferred Alternative, two-phased approach

Approximately 120 hectares (300 acres) of the Main Base are currently populated by buildings, roads, runways, and other infrastructure and 150 hectares (380 acres) are forested, leaving approximately 520 hectares (1,280 acres), or 66 percent of the Main Base as open areas.

The construction of the new facilities and paved areas in a forested area on the Main Base would result in up to 1.40 hectares (3.48 acres) of land unavailable for future uses as well as a change to current land use in the project area. The 1.40 hectares (3.48 acres) of land under the Preferred Alternative two-phased approach would occupy is about 0.27 percent of the currently

unoccupied land. Improvements under the Preferred Alternative, two-phased approach would result in negligible long-term impacts on land use in those specific areas.

The land uses planned for the Main Entrance Reconfiguration are consistent with NASA's master plan. The proposed land use change is also consistent with the industrial zoning of the adjacent Wallops Research Park (WRP, directly across Atlantic Road) and therefore would not impact use of the WRP.

Preferred Alternative, four-phased approach

Impacts on land use would be similar to the two-phased approach. The construction of facilities and paved areas in a forested area on the Main Base would result in up to 1.07 hectares (3.41 acres) of land unavailable for future uses as well as a change to current land use in the project area. The 1.07 hectares (3.41 acres) of land the Preferred Alternative four-phased approach would occupy is about 0.21 percent of the currently unoccupied land. Improvements under the Preferred Alternative, four-phased approach would result in negligible long-term impacts on land use in those specific areas.

Alternative One

The construction of the facilities and paved areas on undeveloped land within the Main Base boundary would result in up to 1.54 hectares (3.95 acres) of land unavailable for future uses as well as a change to current land use in the project area. The 1.54 hectares (3.95 acres) of land under Alternative One would occupy is about 0.24 percent of the currently unoccupied land. The placement of the badge office and parking lot in an open field next to Navy and Coast Guard housing would reduce the amount of space available for residents' recreational purposes. Additionally, the location of the badge office under Alternative One would be approximately 90 meters (300 feet) away from civilian housing. Given the proximity of the badge office to the residences, impacts under Alternative One would be classified as moderate and long term.

3.1.2 Soils

3.1.2.1 Affected Environment

The Coastal Plain soils of the Eastern Shore are generally very level, and many soil types are considered to be prime farmland by the U.S. Department of Agriculture (USDA). The dominant agricultural soils in the region are high in sand content, which results in a highly leached condition, an acidic pH, and a low natural fertility. Some of the areas surrounding WFF, as well as parts of the Main Base, contain soil types that are classified as prime or unique farmland by the Natural Resources Conservation Service (USDA, 1994). Because the project site is within an area designated for urban and industrial uses, the Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) does not apply.

A Custom Soil Resource Report was generated for the project area through the use of an interactive USDA website and soils database for Accomack County, Virginia (USDA, 2011). Soils at the Preferred Alternative and Alternative One sites are both Bojac fine sandy loam, with 0 to 2 percent slopes; a nearly level, very deep, and well-drained soil.

3.1.2.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no changes or impacts to soils.

All Action Alternatives

The USDA Soil Survey assigns the project sites' soil type ratings of "low" and "medium" for hazard of water and wind erosion, respectively. Accordingly, soils could be transported off-site during construction by wind or precipitation during storm events. However, as the soils within the sites are gently sloped and as NASA would implement strict erosion and sediment controls, it is expected that any losses would be minor.

3.2 Water Resources

3.2.1 Coastal Zone

3.2.1.1 Affected Environment

The Virginia Department of Environmental Quality (VDEQ) is the lead agency for the Virginia Coastal Zone Management (CZM) Program, which is authorized by NOAA to administer the Coastal Zone Management Act of 1972. Any Federal agency development in Virginia's Coastal Management Area (CMA) must be consistent with the enforceable policies of the CZM Program. Although Federal lands are excluded from Virginia's CMA, any activity on Federal land that has reasonably foreseeable coastal effects must be consistent with the CZM Program. Enforceable policies of the CZM Program that must be considered when making a Federal Consistency Determination include:

- **Fisheries Management.** Administered by Virginia Marine Resource Commission (VMRC), this program stresses the conservation and enhancement of shellfish and finfish resources and the promotion of commercial and recreational fisheries.
- **Subaqueous Lands Management.** Administered by VMRC, this program establishes conditions for granting permits to use State-owned bottomlands.
- **Wetlands Management.** Administered by the VMRC and VDEQ, the wetlands management program preserves and protects tidal wetlands.

- **Dunes Management.** Administered by VMRC, the purpose of this program is to prevent the destruction or alteration of primary dunes.
- **Non-Point Source Pollution Control.** Administered by the Virginia Department of Conservation and Recreation (DCR), the Virginia Erosion and Sediment Control Law is intended to minimize non-point source pollution entering Virginia's waterways.
- **Point Source Pollution Control.** Administered by VDEQ, the Virginia Pollutant Discharge Elimination System (VPDES) permit program regulates point source discharges to Virginia's waterways.
- **Shoreline Sanitation.** Administered by the Virginia Department of Health, this program regulates the installation of septic tanks to protect public health and the environment.
- **Air Pollution Control.** Administered by VDEQ, this program implements the Federal Clean Air Act (CAA) through a legally enforceable State Implementation Plan.
- **Coastal Lands Management.** Administered by the Chesapeake Bay Local Assistance Department, the Chesapeake Bay Preservation Act guides land development in coastal areas to protect the Chesapeake Bay and its tributaries.

Because WFF is within Virginia's CMA, its activities are subject to the Federal Consistency requirement.

3.2.1.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, implementation of the Main Entrance Reconfiguration project would not occur; therefore, no impacts on the coastal zone would occur.

All Action Alternatives

All activities under the Preferred Alternative (either phasing option) and Alternative One occur within Virginia's CMA as designated by Virginia's CZM Program. NASA has determined that the actions planned for the Main Entrance Reconfiguration project are consistent with enforceable policies of the CZM Program. Based on the information and analysis in this EA and the Federal Consistency Determination (Appendix A), NASA determined that the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the CZM Program.

3.2.2 Stormwater

3.2.2.1 Affected Environment

WFF is located in the Eastern Lower Delmarva and the Chincoteague watersheds. The entire Main Base is part of the Chincoteague Bay watershed. The Chincoteague Bay watershed has a relatively small population, with an average density of less than 105 people per square kilometer (40 per square mile), little topographic relief, and a high water table (NASA, 2008a).

Surface waters in the vicinity of WFF are saline to brackish and are influenced by the tides. Outgoing tidal flow is generally north and east to Chincoteague Inlet and out to the Atlantic Ocean; incoming tides flow in the reverse direction. No wild or scenic rivers are located on or adjacent to the Main Base; therefore, the Wild and Scenic Rivers Act (16 U.S.C. 1271–1287) does not apply to this project (NASA, 2008a).

Little Mosquito Creek forms the northwest and northern boundary of the Main Base. The western side of the Main Base is bounded by a tributary to Little Mosquito Creek named Wattsville Branch. Little Mosquito Creek flows east through Mosquito Creek to Simoneaston Bay, then to Chincoteague Bay and out to the Atlantic Ocean. Little Simoneaston Creek and a section of the Virginia Inside Passage (a federally maintained navigational channel frequently used by commercial and recreational boaters) that traverses Simoneaston Bay, is located east of the Main Base.

The majority of WFF Main Base is positioned on a high terrace landform (7.62 to 12.19 meters [25 to 40 feet] above mean sea level [amsl]) with the northern and eastern portions located on low terraces (0 to 7.62 meters [0 to 25 feet] amsl) and tidal marsh. The current location of the main entrance as well as the proposed locations for both the Preferred Alternative and Alternative One are positioned between 10 to 13 meters amsl (35 and 41 feet). Stormwater flows off the Main Base by both natural drainage patterns and stormwater swales and drains which intercept and divert flow. Stormwater inlets are located throughout the developed portion of the Main Base and the majority of stormwater discharges through numerous outfalls into the surrounding waterways, and eventually the Atlantic Ocean. The natural drainage pattern on the western and southwestern portions of the Main Base, where the main entrance is located, is toward a branch of Little Simoneaston Creek.

The Clean Water Act (CWA) (33 U.S.C. §1251 *et seq.*), as amended in 1977, established the basic framework for regulating discharges of pollutants into the waters of the United States.

The CWA National Pollutant Discharge Elimination System (NPDES) (33 U.S.C. 1342) requires permits for stormwater discharges associated with industrial activities. Virginia DEQ is authorized to carry out NPDES permitting under the VPDES (9 VAC 25-151). NASA maintains a site-wide Stormwater Pollution Prevention Plan (SWPPP) to ensure that its operations have minimal impact on stormwater quality (NASA, 2010a).

The Virginia Stormwater Management Program (VSMP) regulations in Chapter 3-20 of Title 4 of the Virginia Administrative Code (VAC) (4 VAC 3-20), administered by DCR, require that construction and land development activities incorporate measures to protect aquatic resources from the effects of increased volume, frequency, and peak rate of stormwater runoff and from increased non-point source pollution carried by stormwater runoff. The VSMP also requires that land-disturbing activities of 0.4 hectare (1 acre) or greater develop a SWPPP and acquire a permit from the Virginia DCR prior to construction. Construction and demolition activities at WFF are subject to VSMP permitting. NASA and its tenants develop site-specific SWPPPs and acquire the necessary permits as part of early project planning (NASA, 2010a).

3.2.2.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no impacts to stormwater conveyance.

Preferred Alternative, two-phased approach

Under the Preferred Alternative, two-phased approach, construction activities could result in temporary impacts to stormwater conveyance due to disruptions and changes to the natural drainage. NASA would obtain VSMP construction site stormwater permits and implement site-specific SWPPPs to minimize impacts to stormwater conveyance and stormwater quality during construction. The SWPPP would identify all stormwater discharges at the facility, actual and potential sources of stormwater contamination, and would require the implementation of both structural and non-structural Best Management Practices (BMPs) to reduce the impact of stormwater runoff on the receiving stream to the maximum extent practicable, and to meet water quality standards.

Trees affect stormwater runoff through three primary processes: interception, transpiration, and infiltration. Interception is the collection of precipitation on the structure of the tree and the subsequent evaporation of moisture, which would otherwise become runoff. Transpiration is the transfer of water from the soil through the tree and its eventual release in a gaseous form through microscopic pores in the leaves and stems. Infiltration is the movement of surface water through the soil. Tree roots, combined with organic material that typically builds on the soil at the base of trees, promote the infiltration of runoff through shallow subsurface zones, helping to reduce both the rate and volume of stormwater runoff. The permanent removal of 1.40 hectares (3.48 acres) trees (and conversion to impervious surface) would increase the volume of water discharging from the site.

No long-term adverse impacts to stormwater conveyance are anticipated because NASA would incorporate permanent stormwater control measures into design plans. Measures could include integrating grass swales around newly paved parking lots, which would slow the flow of

stormwater and promote runoff infiltration into the surrounding soils. All control measures to reduce stormwater-carried nonpoint source pollution would be designed and constructed in accordance with VSMP laws and regulations. Additionally, stormwater would flow through approximately 2.5 kilometers (1.5 miles) of vegetated swale to reach the receiving water, an unnamed branch of Little Simoneaston Creek (Figure 3-1). With the exception of severe storm events, all stormwater from the site would infiltrate into the swale before reaching the receiving water.

Preferred Alternative, four-phased approach

Impacts to stormwater conveyance would be similar to those described under the Preferred Alternative two-phased approach. With more phases than the two-phased approach, construction impacts to stormwater could be less due to having less exposed soil at the same time. It is expected that each phase's smaller disturbed area would be re-vegetated prior to the next being disturbed, which would reduce the potential for contaminated stormwater runoff. Long term, the difference in amount of added impervious surface (and resultant increase in stormwater runoff) is negligible between the two- or four-phased Preferred Alternative at final buildout.

Alternative One

Impacts to stormwater conveyance under Alternative One would be slightly more than those under the Preferred Alternative two-phased approach due to the addition of approximately 1.54 hectares (3.95 acres) of impervious surface; 0.21 hectares (0.52 acres) more than the Preferred Alternative, two-phased approach. Additionally, stormwater would flow through approximately 2 kilometers (1.25 miles) of vegetated swale to reach the receiving water, an unnamed branch of Little Simoneaston Creek. With the exception of severe storm events, all stormwater from the site would infiltrate into the swale before reaching the receiving water.

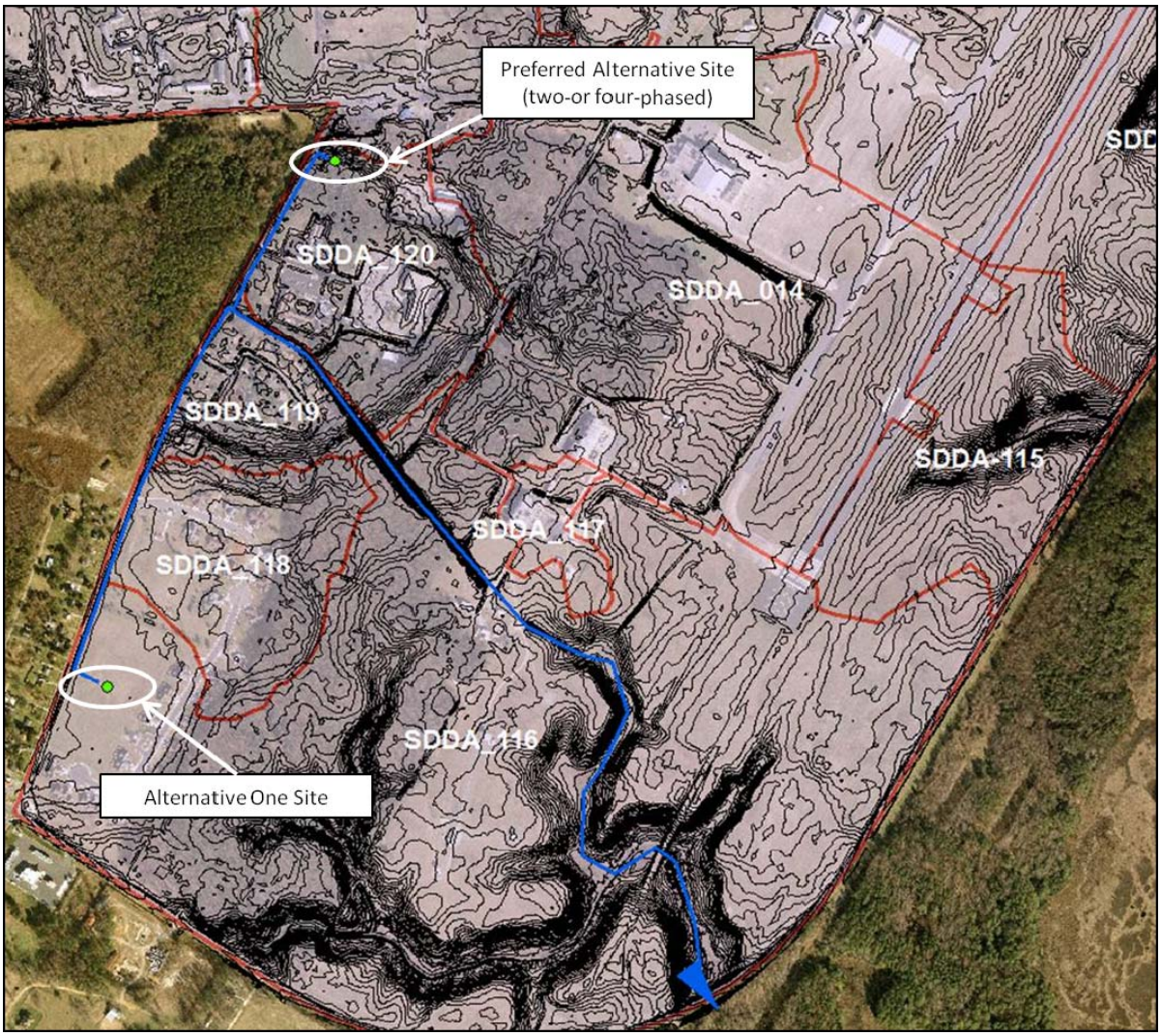

Figure 3-1: Elevation contour map depicting stormwater drainage flow from the Action Alternative sites

3.3 Air Quality

3.3.1 Affected Environment

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the Federal and State ambient air quality standards. The CAA, and its subsequent amendments, established the National Ambient Air Quality Standards (NAAQS) for seven "criteria" pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 (PM_{10}) and 2.5 ($PM_{2.5}$) microns in diameter, and lead (Pb). These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

States have the authority to adopt stricter standards; however the Commonwealth of Virginia has accepted the Federal standards and has incorporated them by reference in 9 VAC 5-30 (NASA, 2010b).

Areas that exceed a Federal air quality standard are designated as non-attainment areas. Wallops Main Base is located in Accomack County, an attainment area (an area considered to have air quality that is as good as or better than the NAAQS) for all seven listed criteria air pollutants; therefore, a General Conformity Review (under Section 176(c) of the CAA) does not apply to Federal actions implemented at WFF.

A synthetic minor source is an air pollution source that has the potential to emit (PTE) air pollutants in quantities at or above the major source threshold levels, but has voluntarily accepted federally enforceable limitations to keep the emissions below these levels. Wallops Main Base is considered a synthetic minor source and has its own facility-wide state operating air permit (Permit Number 40217, amended February 5, 2009) for stationary sources (any building, structure, facility or installation which emits or may emit any listed criteria air pollutant from one, non-moving point [i.e., smoke stack or geographic area]). Major source threshold levels, in an attainment area, are reached if a facility's combined sources have a PTE greater than or equal to:

- 90.7 metric tonnes (100 tons) per year of the criteria pollutants, or
- ≥ 9.1 metric tonnes (10 tons) per year of a single Hazardous Air Pollutant (HAP), or
- 23 metric tonnes (25 tons) per year of combined HAPs.

Table 3-2 provides the actual emissions of criteria pollutants for calendar year 2009 at WFF based on the 2009 Annual Update Forms (NASA, 2010a).

Table 3-2 WFF criteria pollutant emissions for CY 2009

2009 WFF Emission Statement	Main Base Tonnes/yr
VOC	0.54 (0.59)
NOx	16.60 (18.30)
SO_2	23.70 (26.13)
PM_{10}	2.30 (2.54)
Pb	0.49 (0.54)
CO (Optional)	1.73 (1.91)
$PM_{2.5}$ (Optional)	N/A
NH_3 (Optional)	N/A

VOC = Volatile Organic Compounds
NOx = Nitrogen Oxides
NH_3 = Ammonia

3.3.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no impacts to air quality.

Preferred Alternative, two-phased approach

The proposed locations for main entrance reconfiguration would be in an attainment area for all criteria pollutants; therefore, NASA is not required to perform a general conformity review for the Preferred Alternative.

Construction activities would generate fugitive dust from clearing, trenching, backfilling, grading, and traffic on paved and unpaved areas, as well as combustion emissions from construction equipment. The internal combustion engines powering most of the construction equipment and vehicles would burn diesel fuel and the remaining vehicles would burn gasoline. Equipment that would be used for the construction activities is anticipated to include earthmoving equipment, pickup trucks, and compressors. To minimize impacts during construction, site-specific dust suppression methods would be implemented to minimize windblown and vehicular-borne fugitive dust generated from the construction site areas (e.g., daily watering of disturbed surfaces and soil stockpiles, covering stockpiles, implementing track-out controls). Vehicles and equipment used for construction would be maintained in good working order. Effective June 2010, non-road diesel engines are required by law to utilize ultra low-sulfur diesel, which must meet a 15 parts per million (ppm) sulfur maximum. Additionally, idling of construction equipment would be prohibited when feasible. Construction-related impacts are expected to be short-term and limited to the duration and area of the construction activities.

The criteria pollutant emissions, except VOCs, from the construction phase were estimated using the modeling tool developed for the U.S. Air Force, called Air Conformity Applicability Model (ACAM), version 4.3.3 (Air Force Center for Environmental Excellence, 2005). VOC emissions were calculated based upon limitations set for in 9 VAC 5-40-5510D (Emission Standards for Asphalt Paving Operations [Rule 4-39]) which states that "…annual average of volatile organic compound content for all emulsified asphalts used does not exceed 6% of volatile organic compounds by volume." The emissions summary is shown in Table 3-3.

Table 3-3: Criteria pollutant emissions, Preferred Alternative, two-phased approach (tonnes/tons)

Year	CO	NO_x	SO_2	VOC	PM_{10}	$PM_{2.5}$
2011	0	0	0	0.1 / 0.1	3.0 / 3.3	0
2012	< 0.1 / < 0.1	0	0.3 / 0.3[1]	0	0	0
Total	< 0.1 / < 0.1	0	0.3 / 0.3	0.1 / 0.1	3.0 / 3.3	0

[1]SO_2 emissions may be measurable in the two-phased approach because construction would take place in a compressed time frame. The remaining alternatives may have SO_2 emissions but as these actions occur over a longer time period, the resultant emissions would be below 0.1 tonnes (0.1 tons).

Preferred Alternative, four-phased approach

Similar to the Preferred Alternative two-phased approach, reviews for general conformity would not be necessary. The same BMPs described under the Preferred Alternative two-phased approach to reduce construction emissions would reduce air quality impacts from the construction, grading, paving, and tree removal activities for the four-phased approach. Criteria pollutant emissions summaries estimated using ACAM 4.3.3 and the method described above for VOCs are listed in Table 3-4. Construction-related impacts are expected to be short-term and limited to the duration and area of the construction activities.

Table 3-4: Criteria pollutant emissions, Preferred Alternative, four-phased approach (tonnes/tons)

Year	CO	NO_X	SO2	VOC	PM_{10}	$PM_{2.5}$
2011	0	0	0	0.1 / 0.1	0.7 / 0.8	0
2012	0	0	0	0	3.0 / 3.3	0
2013	< 0.1 / < 0.1	0	0	0.3 / 0.3	0	0
Total	< 0.1 / < 0.1	0	0	0.4 / 0.4	3.7 / 4.1	0

Alternative One

Similar to the Preferred Alternative two-phased approach, reviews for general conformity would not be necessary. The same BMPs described under the Preferred Alternative two-phased approach to reduce construction emissions would reduce air quality impacts from the construction, grading, paving, and tree removal activities for Alternative One. Criteria pollutant emissions summaries estimated using ACAM 4.3.3 and the method described above for VOCs are listed in Table 3-5. Construction-related impacts are expected to be short-term and limited to the duration and area of the construction activities.

Table 3-5 Criteria pollutant emissions, Alternative One (tonnes/tons)

Year	CO	NO_X	SO2	VOC	PM_{10}	$PM_{2.5}$
2011	0	0	0	0.2 / 0.2	1.5 / 1.6	0
2012	0	0	0	0	3.0 / 3.3	0
2013	< 0.1 / < 0.1	0	0	0.3 / 0.3	0	0
Total	< 0.1 / < 0.1	0	0	0.4 / 0.5	4.5 / 5.0	0

3.4 Climate Change

3.4.1 Affected Environment

Historically, greenhouse gases (GHGs) have not been regulated pollutants under the CAA. On December 7, 2009, the EPA Administrator signed a final action finding that six GHGs constitute a threat to public health and welfare and that the combined emissions from motor vehicles cause and contribute to the climate change problem. On April 1, 2010, EPA and the Department of Transportation's National Highway Safety Administration issued the first national rule limiting GHG emissions from cars and light trucks. The requirements of the GHG light duty vehicle rule took effect on January 2, 2011. EPA's Mandatory Reporting of Greenhouse Gases Rule also became effective on January 2, 2011, requiring large stationary sources in the U.S. to report GHG emission data. In general, the Rule, codified in 40 CFR Part 98, requires that facilities that emit 25,000 tonnes (27,500 tons) or more per year of GHGs are required to submit annual reports to EPA.

EPA and the National Highway Traffic Safety Administration announced their joint Proposed Rule for *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles* on November 30, 2010 in 75 FR 74152 and have announced a Notice of Intent for *Setting Future Greenhouse Gas and Fuel Economy Standards for Passenger Cars and Light Trucks*, in October 2010. NASA will comply with all provisions of these Rules as they become finalized.

On December 21, 2007, Virginia's prior governor, Timothy Kaine, issued Executive Order 59, creating the Governor's Commission on Climate Change and setting a target of reducing statewide GHG emissions to 30% below business as usual (2000 levels) by 2025. On January 2, 2011, Virginia passed its Final Rule on reporting of GHG emissions from stationary sources (9 VAC 85 *et seq.*). The regulation mandates controls on stationary sources of air pollutants but does not address mobile (e.g., construction equipment) sources. In this regulation, Virginia defines "significant" as 68,000 tonnes (75,000 tons) per year CO_2e emission.

There is additional Federal climate change-related legislation such as EO 13514, *Federal Leadership in Environmental, Energy and Economic Performance*. Signed October 2009, the

EO calls on the Federal Government to lead by example towards building a clean energy economy, including by measuring, reporting, and reducing greenhouse gas emissions from direct and indirect activities. It requires Federal agencies to "establish and report to the CEQ Chair and Office of Management and Budget Director a comprehensive inventory of absolute greenhouse gas emissions, including scope 1, scope 2, and specified scope 3 emissions." CEQ is responsible for issuing Federal guidance for this task.

GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and several hydro- and chlorofluorocarbons. Each GHG is assigned a global warming potential (GWP), which is the ability to trap heat, and is standardized to CO_2, which has a GWP value of 1. For example, N_2O has a GWP of 310, meaning it has a global warming effect 310 times greater than CO_2 on an equal-mass basis. For simplification, total GHG emissions are often expressed as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying each GHG emission by its GWP and adding the results to produce a combined rate to represent all GHGs emitted by an activity.

GHG emissions were calculated for both WFF Mainland/Wallops Island and the Main Base to estimate NASA's contribution in calendar year 2008. These emissions resulting from mobile (government-owned vehicles and rocket launches) and stationary source operations at WFF in 2008 will be referred to as the "baseline" condition for the analysis in this EA.

Table 3-6 lists the GHG emissions for WFF based on the 2008 Annual Update Forms. Emission factors from the EPA's AP-42 and Environment Canada's National Inventory Report Annex 13 were used in conjunction with the WFF fuel consumption rates to calculate annual GHG emissions for boilers/heating equipment and emergency generators.

Table 3-6: Calendar year 2008 greenhouse gas emissions at WFF main base by pollutant (tonnes/tons)[1]

Pollutant	WFF Main Base
CO_2	7,978 / 8,794
CH_4	<1
N_2O	<1
CO_2e	7,993 / 8,811

[1]Source: NASA, 2010a

Trees capture CO_2 by taking it into their cells through photosynthesis. They then store the carbon in their bodies; a tree is comprised of about 50 percent carbon. Some carbon gets released back into the atmosphere through respiration, but the net effect is tremendous carbon storage (Johnson, 2009).

Permanent woodland conversion contributes to releases of carbon stored in vegetation and soils to the atmosphere. Emissions depend on both the rate of deforestation and changes in carbon stock per hectare (acre) after deforestation, with changes in carbon stocks varying with land use, region, ecosystem, and use of the removed forest biomass. For example, burning results in immediate releases of forest carbon, whereas unburned organic matter releases carbon more slowly during the decay process. Loss of carbon may take place over 100 years or more for some wood products (Sohngen and Beach, 2006). Brent Sohngen and Robert H. Beach estimate that 120 tonnes of carbon are released per hectare of deforestation (50 tons/acre).

3.4.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the Main Entrance to the Main Base would not occur; therefore, emissions would remain at present levels as described in Table 3-7 (calendar year 2008 summary table for WFF emissions).

Preferred Alternative, two-phased approach

Upon final buildout of the Preferred Alternative two-phased approach, 1.40 hectares (3.48 acres) of trees would be removed. Trees consume CO_2, a major contributor to the greenhouse effect; leaves also absorb other air pollutants—such as ozone, carbon monoxide, and sulfur dioxide—and give off oxygen. By removing these trees, approximately 168 tonnes (185 tons) of carbon would be released into the atmosphere (Sohngen and Beach, 2006).

The addition of asphalt and use of diesel-fuel-consuming construction equipment would also contribute to GHG emissions. Construction equipment burns diesel fuel at a typical rate of 15 liters (4 gallons) per hour. The EPA's Office of Transportation and Air Quality has calculated that every 3.8 liters (1 gallon) of diesel fuel burned emits 10 kg (22 pounds) of CO_2e. [3] Table 3-7 compares the CO_2e emissions for construction equipment from initial construction through final buildout among the Action Alternatives.

According to Alexander Brown, Canadian Regional Engineer of the Asphalt Institute (Brown, 2009), the carbon footprint of a pavement needs to take into account the initial construction, maintenance, and construction equipment use. Brown calculated the CO_2e conversion factor for hot mix asphalt (HMA) as 0.0103; meaning that for a given volume of HMA 0.0130 times that volume of CO_2e will be emitted. Table 3-8 compares the GHG emissions from paving of the parking areas among each phase of the Action Alternatives.

[3] EPA's Emission Facts can be accessed at http://www.epa.gov/otaq/climate/420f05001.htm

Brown also stated that the carbon footprint from paving must consider the 50-year life cycle emissions from maintenance of the paved surface (e.g., sealing and paving cracks, coating). Table 3-9 is based upon a 90 mm (3.5 inch) thick layer of HMA (over a gravel sub-base) and compares the life cycle maintenance emissions among the alternatives. Note that these emissions would be spread over the 50-year life cycle.

Preferred Alternative, four-phased approach

Upon final buildout of the Preferred Alternative four-phased approach, 1.38 hectares (3.41 acres) of trees would be removed, similar to the Preferred Alternative two-phased approach, and would release approximately 165 tonnes (180 tons) of carbon resulting in a negligible adverse impact. The use of diesel-fuel-consuming construction equipment and addition of asphalt would be expected to make impacts similar to the Preferred Alternative two-phased approach (see Tables 3-7 through 3-9).

Alternative One

Final Buildout of Alternative One would remove the least amount of trees, 1.05 hectares (2.60 acres); however, the removal of trees would release approximately 126 tonnes (140 tons) of carbon resulting in minor adverse impact. The use of diesel-fuel-consuming construction equipment would be expected to make impacts similar to the Preferred Alternative two-phased approach. The addition of 0.24 hectares (0.59 acres) more asphalt (compared to the Preferred Alternative two-phased approach) would be expected to have slightly greater impacts to climate change, but would still be a negligible adverse impact (see Tables 3-7 through 3-9).

Summary Comparison Tables

In summary, it is anticipated that GHG emissions from all Action Alternatives would be transient and have a negligible adverse impact on global warming.

Table 3-7: GHG emissions from construction equipment through final buildout

Alternative	Tonnes CO_2e	Tons CO_2e
Preferred Alternative, two-phased	70.33	63.94
Preferred Alternative, four-phased	109.40	99.46
Alternative One	128.94	117.22

Table 3-8: GHG emissions for asphalt paving

Alternative	Asphalt Paving	
	Tonnes CO_2e	**Tons CO_2e**
Preferred Alternative, two-phased		
Phase I	16.94	18.63
Phase II	12.80	14.08
TOTAL	29.74	32.71
Preferred Alternative, four-phased		
Phase I	9.46	10.41
Phase II	0	0
Phase III	0	0
Final Buildout	29.11	32.02
TOTAL	38.57	42.43
Alternative One		
Phase I	14.15	15.56
Phase II	0	0
Phase III	0	0
Final Buildout	21.45	23.56
TOTAL	21.45	23.59

Table 3-9: 50-year life cycle GHG emissions from maintenance of paved surfaces

Alternative	Tonnes CO_2e	Tons CO_2e
Preferred Alternative, two-phased	127.79	140.57
Preferred Alternative, four-phased	125.08	137.58
Alternative One	152.96	168.25

3.5 Noise

3.5.1 Affected Environment

The EPA's Noise Control Act of 1972 (42 U.S.C. 4901 to 4918) as amended by the Quiet Communities Act of 1978, states that the policy of the United States is to promote an environment for all Americans free from noise that jeopardizes their health or welfare.

Noise is defined as any loud or undesirable sound. Sound is quantified in units called decibels (dB). For traffic noise, an adjustment, or weighting, of the high and low-pitched sounds is made to approximate the way that an average person hears sounds. The adjusted sounds are called "A-weighted levels" (dBA). The A-weighted decibel scale begins at zero. This represents the faintest sound that can be heard by humans with very good hearing. The loudness of sounds (that is, how loud they seem to humans) varies from person to person, so there is no precise definition of loudness. However, based on many tests of large numbers of people, a sound level

of 70 dBA is twice as loud to the listener as a level of 60 dBA (Washington State Department of Transportation [WSDOT], 2010). Table 3-10 provides some typical noise levels for familiar noise sources.

Table 3-10: Typical noise levels of familiar noise sources and public responses

Thresholds/Noise Sources	Sound Level (dBA)	Subjective Evaluation[a]	Possible Effects on Humans[a]
Human threshold of pain	140	Deafening	Continuous exposure to levels above 70 dBA can cause hearing loss in the majority of the population
Siren at 100 feet Loud rock band	130		
Jet takeoff at 200 feet Auto horn at 3 feet	120		
Chain saw Noisy snowmobile	110		
Lawn mower at 3 feet Noisy motorcycle at 50 feet	100	Very Loud	
Heavy truck at 50 feet	90		
Pneumatic drill at 50 feet Busy urban street, daytime	80	Loud	
Normal automobile at 50 mph Vacuum cleaner at 3 feet	70		Speech interference
Air conditioning unit at 20 feet Conversation at 3 feet	60	Moderate	
Quiet residential area Light auto traffic at 100 feet	50		Sleep interference
Library / Quiet home	40	Faint	
Soft whisper at 15 feet	30		
Slight rustling of leaves	20	Very Faint	
Broadcasting studio	10		
Threshold of Human Hearing	0		

[a]Both the subjective evaluations and the physiological responses are continuums without true threshold boundaries. Consequently, there are overlaps among categories of response that depend on the sensitivity of the noise receivers.
Source: EPA, 1974 (NASA, 2010b).

Traffic Noise

Traffic noise depends on three things; the volume of traffic, the speed of traffic, and the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires.

The loudness of traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline) that causes heavy laboring of vehicle engines will also increase traffic noise levels. In addition, there are other more complicated factors that affect the loudness of traffic noise. For example, as a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles. Traffic noise is not usually a serious problem for people who live more than 150 meters (500 feet) from heavily traveled freeways or more than 30 to 60 meters (100 to 200 feet) from lightly traveled roads (WSDOT, 2010).

Noise impacts

To protect the citizens in the Commonwealth and provide for consistency in the application of noise abatement measures, the Virginia Department of Transportation (VDOT) adopted a Noise Abatement Policy based upon Federal Highway Administration (FHWA) regulations. The Commonwealth noise abatement policy is adopted under Section 33.1-12 of the Code of Virginia.

According to the FHWA, noise impacts occur when the projected highway noise levels:

- Approach (reach one decibel less than) or exceed the Noise Abatement Criteria (NAC) contained in 23 CFR 772 (see Table 3-9), or
- Exceed existing noise levels by a substantial amount (10 dB or more)

Noise impacts beyond 300 meters (1,000 feet) from the roadway are not considered in determining the need for noise abatement.

Since sounds in the outdoor environment are usually not continuous, a common sound level measurement unit, the Equivalent Sound Level (L_{eq}), is used to measure average environmental noise levels to which people are exposed over a given time period. More specifically, the L_{eq} is a single value of sound level for any desired duration, which includes all of the time-varying sound energy within the measurement period. For example, an L_{eq} of 58 dBA indicates that the amount of sound energy recorded during a specified time period (e.g. one hour), including the highs and lows, is equivalent to the energy in a continuous sound of 58 dB for the studied time period (e.g., 1 hour) (EPA, 1974).

Table 3-11: FHWA NAC for determining potential noise impacts from a project

Activity Category	$L_{eq}(h)$[1]	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D		Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

[1] L_{eq} (h)-The hourly value of Leq (Source 23 CFR Part 772)

A baseline noise analysis was performed in 1992 for WFF during both peak and off-peak traffic periods. The 1-hour L_{eq} was used to describe monitored baseline noise levels in the area surrounding WFF. Noise sources included vehicular traffic, aircraft activities, and natural environmental sounds. Near the Main Base, sensitive receptors include homes, a campground/marina, and portions of the Wallops Island National Wildlife Refuge. Homes and buildings within the NASA boundaries are not considered to be sensitive receptors, but were included in the analysis for comparative purposes (NASA, 2005).

The FHWA's NAC (Table 3-9) was used as a standard to analyze the WFF baseline noise analysis results against. Since the conditions around the Main Base fall under "Activity Category B" the exterior (or outside) L_{eq} should not exceed 67 dBA.

Noise ranges were determined for Navy and U.S. Coast Guard housing on the Main Base and areas north of the Main Base such as Dublin Farms and Trail's End Campground and Marina. Homes along intersections and roadways adjacent to the Main Base generally experience noise levels of 56 to 61 dBA during peak traffic periods, and 54 to 58 dBA during off-peak traffic periods. Noise levels at homes in relatively quiet areas (away from the roadways) range from 49 dBA to 58 dBA, depending on the range of background noises.

Higher noise levels were found at the busy intersection of State Routes 175, 679, and 798. Routes 679 (Atlantic Road) and 798 (Mill Dam Road) merge at the main entrance of WFF. At this site, noise levels range from 64 to 67 dBA during both peak and off-peak periods (NASA, 2005).

Occupational Noise

The U.S. Occupational Safety and Health Administration (OSHA) regulates noise impacts to workers. OSHA regulations on noise standards ensure that workers are not exposed to noise levels higher than 115 dBA. Exposure to 115 dBA is limited to 15 minutes or less during an 8-hour work shift. Exposure to impulsive or impact noise (loud, short duration sounds) is not to exceed 140 dB peak sound pressure level (NASA, 2010a).

3.5.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, therefore noise levels would remain the same.

Preferred Alternative, either phasing option

Both phasing options would present similar effects. Construction activities (tree clearing, grading, paving, etc.) for reconfiguring the Main Base entrance have the potential to generate temporary increases in noise levels. NASA would comply with local noise ordinances and State and Federal standards and guidelines for potential impacts on humans caused by construction activities. No significant noise-producing activities would be routinely conducted before 7:30 a.m. or after 4:30 p.m., typical hours of construction. Any activities outside of typical work hours that could create disruptive noise levels would be coordinated directly with the persons affected by the planned activity.

The Federal Highway Administrative (FHWA) has developed an analysis tool, the Roadway Construction Noise Model (RCNM), which acts as a basic screening tool that can be used for the prediction of construction noise during the various stages of project development and construction (FHWA, 2010). Parameters were entered into the RCNM for the Preferred Alternative two-phased approach and the results indicate that the closest sensitive receptor (Navy family housing at 320 meters [1050 feet]) would not experience an increase in noise levels above the NAC level of 67 dBA; therefore impacts from construction noise would be minor and temporary.

In the long term, the loading and unloading of trucks at the combined Shipping and Receiving Facility would increase background noise levels during normal business hours, however levels are not expected to exceed those produced during construction, and accordingly would not be

expected to perceptibly alter levels currently experienced at the closest sensitive receptor, the Navy family Housing.

Workers near activities producing unsafe noise levels, according to OSHA regulations, would be required to wear hearing protection equipment. Therefore, impacts on the occupational health of construction workers as a result of construction noise are not expected.

Alternative One

Alternative One is located much closer to sensitive receptors (residential homes at 90 meters [300 feet]) than the Preferred Alternative. The FHWA's RCNM indicated that residents would experience an increase in noise levels above baseline that would exceed the NAC level by up to 7 dB, if all equipment were operating simultaneously. The impacts from construction noise would be greater under Alternative One in comparison to the Preferred Alternative (two- or four-phased approach) but would be moderate and short-term. A Traffic Study performed for the Wallops Research Park in 2007 (Vanasse, Hangen, and Brustlin Inc. [VHB], 2007) indicated that approximately 60 percent of traffic in the vicinity of the WFF Main Base main entrance travels via Mill Dam Road, whereas the remaining 40 percent travels via Atlantic Road. Assuming that visitors to WFF follow that same general split, locating the badge office on Atlantic Road as proposed under this Alternative would result in a certain increase in traffic and accompanying noise levels directly in front of residences both on and off NASA property; a long term adverse effect.

Due to the similar nature of the Action Alternatives, the types of impacts and mitigation measures for occupational noise would be the same as those described for reconfiguration of the main entrance to the Main Base under the Preferred Alternative, two-phased approach.

3.6 Hazardous Materials and Hazardous Waste

3.6.1 Affected Environment

Hazardous Materials Management

The WFF Integrated Contingency Plan (ICP), developed to meet the requirements of 40 CFR 112 (Oil Pollution Prevention and Response), 40 CFR 265 Subparts C and D (Hazardous Waste Contingency Plan), and 9 VAC 25-91-10 (Oil Discharge Contingency Plan), serves as the facility's primary guidance document for the prevention and management of oil, hazardous material, and hazardous waste releases.

Hazardous Waste Management

The regulations that govern hazardous waste management are the Resource Conservation and Recovery Act (RCRA, 42 U.S.C. 6901 et seq.) and Virginia's Hazardous Waste Management Regulations (9 VAC 20-60). All hazardous wastes are classified as solid wastes. A solid waste is

any material that is disposed, incinerated, treated, or recycled except those exempted under 40 CFR 261.4. NASA uses licensed hazardous waste transporters to transport hazardous waste off site to licensed treatment, storage, and disposal facilities.

3.6.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no effects from hazardous materials and generation of hazardous waste.

All Action Alternatives

Impacts from all Action Alternatives would be expected to be equivalent. Construction activities would include the use of hazardous materials and may generate hazardous waste (i.e., solvents, hydraulic fluid, oil, and antifreeze) from the construction equipment. With implementation of safety measures and proper procedures for the handling, storage, and disposal of hazardous materials and wastes during construction activities, no adverse impacts are anticipated during construction. In addition, NASA would require a site-specific SWPPP to be developed prior to the start of construction activities that would adhere to WFF's ICP and contain BMPs related to spill prevention and clean-up procedures for hazardous materials and waste.

3.7 Vegetation

3.7.1 Affected Environment

The vegetative zones from east to west on the Main Base are marsh, thicket, landscaped and mown areas, and upland forest. Inland communities such as fresh and brackish marsh, xeric and mesic shrub, patches of open ground, areas completely covered by pine and pine-deciduous mixed woodlands are often separated from one another by a sharp topographic change. Small rich remnants of upland forests and swamps occur on the Main Base, as well as tidal marshes. Dominant species in the upland forest include loblolly pine, various oaks (*Quercus sp.*), hickory (*Carya sp.),* tulip-poplar (*Liriodendron tulipifera*), dogwood (*Cornus florida*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and sassafras (*Sassafras albidum*). Black willow (*Salix nigra*) and red maple are dominant species in the swamps. Fields, pine forests, lawns, buildings, and pavement are present throughout the Main Base.

A vegetation survey (August 2010) was conducted on the forested area that would be the location of the new badge office for the Preferred Alternative, two- or four-phased approach, to provide information on plant species and their approximate inventory by percentage. According to the survey, loblolly pine is the most abundant tree type in the forested area. The majority of the trees in the area are mature and have been there for as long as 80 years, with signs of successional growth visible only at the fringes (Figure 3-2). A few oaks along the

fence line (Figure 3-3) have been estimated to be between 200 and 300 years old (Ailes, Navy, personal comm.).

Table 3-12: Vegetation survey results

Tree	Scientific name	Percentage (%)
American Holly	*Ilex opaca*	12.7
Black Oak	*Quercus velutina*	10.8
Dogwood	*Cornus florida*	3.9
Loblolly pine	*Pinus taeda*	30.4
Northern Red Oak	*Quercus rubra*	3.3
Pignut Hickory	*Carya glabra*	10.5
Sassafras	*Sassafra albidum*	3.9
Southern Red Oak	*Quercus falcata*	2.1
Sweet Gum	*Liquidambar styrafolia*	3.6
Tulip Tree	*Liriodendron tulipfera*	13.2
White Oak	*Quercus alba*	5.4

Figure 3-2: Vegetation at Preferred Alternative site, facing south

Figure 3-3: Hardwoods near the perimeter of the Preferred Alternative site

3.7.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no impact to vegetation.

Preferred Alternative, two-phased approach

Long-term adverse impacts to vegetation would be anticipated due to the permanent conversion of forest to developed land. The Preferred Alternative two-phased approach would result in the loss of approximately 1.4 hectares (3.48 acres) of trees. All land clearing activities would be performed in accordance with applicable laws and regulations and would utilize appropriate BMPs.

The Preferred Alternative site has some of its older trees located on the fringes of the site near the fence line. Orange tape would be tied around any hardwoods that could be spared and the contractor would be made aware to avoid the marked trees during tree removal. The contractor would be instructed to only clear the path necessary for the project's footprint and no more.

Since the majority of the area cleared would be paved, little revegetation would be possible. Aesthetics would be maintained through planting native landscaping and grasses on any remaining bare soil. Vegetation growth would be monitored until well established.

Preferred Alternative, four-phased approach

Impacts to vegetation under the Preferred Alternative, four-phased approach would be similar to those under the Preferred Alternative two-phased approach due to the removal of approximately 1.38 hectares (3.41 acres) of trees, a difference of only 0.02 hectares (0.07 acres).

Alternative One

Impacts to vegetation under Alternative One would be similar however slightly less than those under the Preferred Alternative two-phased approach due to the removal of approximately 1.05 hectares (2.60 acres) of trees; 0.35 hectares (0.86 acres) less than the Preferred Alternative, two-phased approach.

3.8 Terrestrial Wildlife and Migratory Birds

3.8.1 Affected Environment

Terrestrial fauna comprise the upland biotic communities on the Main Base. Large mammals including whitetail deer (*Odocoileus virginianus*) and red fox (*Vulpes fulva*) are known to inhabit the areas at WFF. Medium and small mammals in the area include raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), grey squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), meadow vole (*Microtus pensylvanicus*), and cotton tail rabbit (*Sylvilagus floridanus*) (NASA, 2005).

The Migratory Bird Treaty Act (MBTA) was enacted to ensure the protection of shared migratory bird resources. The MBTA prohibits the take and possession of any migratory bird, their eggs, or nests, except as authorized by a valid permit or license. A migratory bird is any

species that lives, reproduces, or migrates within or across international borders at some point during its annual life cycle.

On July 10, 1975, the U. S. Fish and Wildlife Service (USFWS) and NASA developed the Wallops Island National Wildlife Refuge (WINWR), comprising approximately 151 ha (373 acres) of salt marsh, grassland, brush habitat, and woodlands. WINWR is located approximately 1.5 kilometers (0.9 miles) east of the Preferred Alternative site and 1.3 kilometers (0.8 miles) east of Alternative One, and contains habitat for a variety of migratory birds (snow geese, black ducks, snowy egrets, black-crowned night herons, dunlin, dowichers, shorebirds, northern harriers, osprey, and great horned owls). Some of the migratory bird species that find refuge in these areas (wood warblers, vireos, kinglets, thrushes, wrens, creepers, nuthatches, woodpeckers and cuckoos) may utilize the forest at the Preferred Alternative site (NASA, 2008b).

3.8.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, there would be no impact to terrestrial wildlife.

Preferred Alternative, two-phased approach

Short-term adverse impacts to wildlife and migratory birds may be anticipated during construction activities due to temporary noise disturbances, especially during spring and fall migrations; however most of the area surrounding the proposed project site is developed and is currently affected by human-related noise including the Main Base airfield. Current noise disruption caused by WFF operations are of low frequency and short duration and already exist.

The permanent removal of approximately 1.40 hectares (3.48 acres) of trees would adversely affect wood-dwelling species. The terrestrial wildlife and/or migratory birds mentioned above would likely be permanently displaced from the area. Less mobile animals (such as invertebrates, amphibians, reptiles, and small mammals) within the construction footprint could be crushed or buried during clearing, grubbing and grading activities. Larger or more mobile animals and birds within or close to the construction footprint would likely migrate to the remaining forested area nearby, or to another suitable habitat in close proximity.

Under the Preferred Alternative two-phased approach, long-term adverse impacts to terrestrial wildlife or migratory birds would be anticipated due to the loss of forested land to developed land. However, given the amount of suitable habit nearby, impacts would not be substantial.

Preferred Alternative, four-phased approach

Impacts to terrestrial wildlife under the Preferred Alternative four-phased approach would be similar to those under the Preferred Alternative two-phased approach due to the removal of nearly the same amount of trees (slightly less at approximately 1.38 hectares [3.41 acres]).

Alternative One

Impacts to terrestrial wildlife under Alternative One would be similar but slightly less than those under the Preferred Alternative two-phased approach due to the removal of approximately 1.05 hectares (2.60 acres) of trees; 0.35 hectares (0.86 acres) less than the Preferred Alternative two-phased approach.

3.9 Health and Safety

3.9.1 Affected Environment

Current Conditions

This section addresses safety concerns created by the current configuration of the main entrance to the Main Base. As traffic (both vehicular and pedestrian) increases, the safety situation will continue to worsen.

The current configuration of the Main Base entrance (Figure 1-2) has security personnel parking their POVs and GOVs in a lot just northeast of the guard house. From this lot, security personnel must cross both inbound and outbound traffic lanes several times per day to access the badge office.

With 16 regular spaces and 2 handicapped spaces, the parking lot for the badge office can become dangerously congested. There are also two truck inspection lanes within the confines of this same parking area. The combination of trucks, vehicles, and people in one small space conducting multiple operations has deteriorated into a safety hazard with the recent increase in visitors.

All visitors to WFF must go through the Badge office, however not all visitors utilizing the badge office parking lot are continuing onto the Main Base. Currently a large volume of construction is taking place on Wallops Island, approximately 11.3 kilometers (7 miles) southeast. Visitors needing to exit the badge office parking lot and travel to Wallops Island must make a maneuver across two traffic lanes and a turn lane with obscured sightlines due to the location of the truck inspection lanes and the existing guard house.

Safety Response Capabilities

WFF maintains 24-hour fire protection on the Main Base and on Wallops Island. Response personnel are trained in hazardous materials emergency response, crash rescue, and fire suppression.

3.9.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur, resulting in an adverse impact to health and safety of WFF personnel and visitors. If the current configuration remains the same, the safety issues inherent with the current configuration would not be addressed. Cars would not be separated from trucks and employees would continue to cross active traffic lanes to get to work. Additionally, visitors needing to exit the badge office parking lot and travel to Wallops Island would continue to make a maneuver across two traffic lanes and a turn lane with obscured sightlines due to the location of the truck inspection lanes and the existing guard house. The number of visitors to WFF would continue to increase and the ability of the current configuration of the main entrance to the Main Base to be able to handle and process additional personnel, vehicles and trucks would continue to decrease.

Preferred Alternative, two-phased approach

Under the Preferred Alternative two-phased approach the goals set to address the Safety concerns would be met during phase 1 of construction. Vehicles would be separated from trucks, employees would no longer have to cross active traffic lanes, and exiting the new badge office parking lot would no longer be a dangerous maneuver.

Construction activities at the proposed site could result in short-term impacts to human health and safety and the increased usage of local fire, police, and medical services. Construction safety procedures and appropriate training would be implemented at the construction site to ensure that events that have the potential to adversely impact human health and safety are minimized.

Preferred Alternative, four-phased approach

Under the Preferred Alternative four-phased approach the goals set to address the Safety concerns would be met only after final buildout. Whereas the Preferred Alternative two-phased approach would immediately address all three safety concerns the Preferred Alternative four-phased approach would have trucks remaining at the current front gate (therefore vehicles and trucks have not been separated) until at least Fiscal Year 2015, when the Shipping and Receiving Facility may be completed.

Construction activities at the proposed site could result in short-term impacts to human health and safety and the increased usage of local fire, police, and medical services. Construction safety procedures and appropriate training would be implemented at the construction site to ensure that events that have the potential to adversely impact human health and safety are minimized.

Alternative One

Under Alternative One, all of the goals set to address the Safety concerns would be met in the first phase of construction. Vehicles would be separated from trucks, employees would no longer have to cross active traffic lanes and exiting the new badge office parking lot would no longer be a dangerous maneuver.

3.10 Transportation

3.10.1 Affected Environment

Primary access to WFF is provided by Route 175, a two-lane secondary road. Atlantic Road (Route 798) has a two-lane cross section that runs north-south and culminates at the Y intersection with Mill Dam Road directly west of the main entrance to the Main Base.

Mill Dam Road is the main ingress/egress route to the WFF Main Base, while Atlantic Road carries the balance. Traffic entering the Main Base merges from Mill Dam Road and Atlantic Road into a single lane directly before the badge office parking lot and guard house area.

Hard surface roads provide access to most buildings at WFF and are maintained by NASA and its tenants. Most organizations at WFF own and maintain a variety of vehicles ranging from sedans and vans to trucks. There is no public transportation on the facility. Many WFF employees carpool to and from the facility.

A traffic impact assessment of the WRP area was conducted during August 2007 to obtain information on existing traffic operations and volumes (VHB, 2007). The area studied lies directly in front of the main entrance to WFF. The study concluded that peak traffic hours on Mill Dam and Atlantic Roads are between 7:15 to 8:15 a.m. and 4:00 to 5:00 p.m., Monday through Friday. Pedestrian and bicycle traffic in the area was noted as minimal.

The study used the Synchro 6® program to model the delay and Level of Service (LOS) information off all intersections around the WFF Main Base. The LOS range is a qualitative measure of capacity and operating conditions and is directly related to vehicle delay. LOS is given a letter designation from "A" to "F", with LOS A representing very short delays and LOS F representing very long delays. A LOS D for turning movements and overall intersections is a typical threshold for acceptable operations. The study determined that the intersection of Atlantic and Mill Dam Roads (directly before the main entrance) currently operates at an overall LOS B or better during each peak period. All other study area intersections (Route 175 with Atlantic Road

and Route 175 with Mill Dam Road) currently operate at an overall LOS C or better during each peak period.

According to the traffic impact analysis, traffic volumes have grown by 3 percent each year since 2001(VHB, 2007). However, more recently, WFF has experienced a marked increase in vehicular traffic. The number of temporary badges issued in 2010 has increased over 140 percent since 2006, which correlates to a considerable increase in the accompanying number of vehicles.

3.10.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur, resulting in an adverse impact to transportation at WFF. Traffic congestion at the main entrance would increase and the Y-intersection would continue to contribute to traffic delays and an increasing risk of vehicular accidents.

Preferred Alternative, either phasing option

Impacts from initiation through final build out for both phased approaches would be generally the same. Temporary impacts to traffic flow would occur during construction activities due to an increase in the volume of construction-related traffic on roads in the immediate vicinity of the proposed project site. Traffic lanes may be temporarily closed or rerouted during construction and paving, and construction equipment and staging could interfere with pedestrian and vehicle flow. NASA would coordinate all transportation activities that would have the potential to affect public roads, including closures, traffic control, safety issues, etc. with Accomack County and the VDOT Accomack Residency Office. To mitigate potential delays, NASA would:

- Provide adequate advance notification of upcoming activities for all areas that would be affected by construction-related traffic, temporary closures, or re-routing;
- Coordinate any traffic lane or pedestrian corridor closures with all appropriate officials;
- Place construction equipment and vehicle staging so as to minimize hindrances to traffic and pedestrian flow; and
- Minimize the use of construction vehicles in residential areas.

NASA consulted with VDOT to discuss the reconfiguration of the main entrance to the Main Base. The VDOT resident engineer approved of the overall design strategy and confirmed that moving the badge office would reduce traffic conflicts, but would not alone eliminate morning traffic queues. The engineer suggested adding a second inbound lane and replacing the current Y intersection with a roundabout.

Relocation of the badge office and the new Shipping and Receiving Facility onto Atlantic Road would redistribute existing traffic. Since there would be no new traffic generation associated with the proposed project a full Traffic Impact Analysis would not be required by VDOT (Weidenhammer, VDOT, personal comm.). However, the development of a comprehensive signing plan was suggested to direct traffic to the appropriate destinations from various entry points to the gate area.

New traffic patterns and appropriate signage on Route 175, Atlantic Road, and Mill Dam Road would be established after construction is complete. The addition of right and left hand turn lanes on Atlantic road at the entrance of the new badge office would facilitate traffic entering the facility in a safe manner.

Any improvements within the VDOT right of way, including turn lanes or entrance connections, would require plan review and approval, and ultimately the issuance of a Land Use Permit to perform construction activities within the right of way.

Alternative One

Alternative One from initiation through final build out would result in similar impacts to transportation as those under the Preferred Alternative phased approaches. However, Alternative One would locate the badge office in an open field directly across from a number of residential homes and close to a major intersection.

It is expected that impacts to Atlantic Road from the relocation of the badge office and the new Shipping and Receiving Facility would be greater than under the Preferred Alternative options. NASA would coordinate all transportation activities that would have the potential to affect public roads, including closures, traffic control, safety issues, etc. with Accomack County and the VDOT Accomack Residency Office. To mitigate potential delays, NASA would:

- Provide adequate advance notification of upcoming activities for all areas that would be affected by construction-related traffic, temporary closures, or re-routing;
- Coordinate any traffic lane or pedestrian corridor closures with all appropriate officials;
- Place construction equipment and vehicle staging so as to not hinder traffic and pedestrian flow; and
- Minimize the use of construction vehicles in residential areas.

Any improvements within the VDOT right of way, including turn lanes or entrance connections, would require plan review and approval, and ultimately the issuance of a Land Use Permit to perform construction activities within the right of way.

3.11 Cultural Resources

3.11.1 Affected Environment

The National Historic Preservation Act (NHPA) of 1966, (P.L. 89-665; 16 U.S.C. 470 et seq.) as amended, outlines Federal policy to protect historic properties and promote historic preservation in cooperation with other nations, Tribal governments, States, and local governments. The NHPA established the National Register of Historic Places (NRHP) and designated the State Historic Preservation Office (SHPO) as the individual responsible for administering State-level programs. The NHPA also created the Advisory Council on Historic Preservation (ACHP), the Federal agency responsible for overseeing the Section 106 process and providing commentary on Federal activities, programs, and policies that affect historic properties.

Section 106 of the NHPA and its implementing regulations (36 CFR 800) outlines the procedures for Federal agencies to follow to take into account their actions on historic properties. The Section 106 process applies to any Federal undertaking that has the potential to affect historic properties, defined in the NHPA as those properties that are listing in or eligible for listing in the NRHP. Under Section 106, Federal agencies are responsible for identifying historic properties within the Area of Potential Effects (APE) for an undertaking, assessing the effects of the undertaking on those historic properties, if present, and considering ways to avoid, minimize, and mitigate any adverse effects. Because Section 106 of the NHPA is a process by which the Federal government assesses the effects of its undertakings on historic properties, it is the primary regulatory framework that is utilized in the NEPA process to determine impacts on cultural resources.

Section 110 of the NHPA calls for Federal agencies to establish historic preservation programs to ensure the identification, protection, and use of historic properties. To that end, in November 2003, WFF prepared a *Cultural Resources Assessment (CRA) of Wallops Flight Facility, Accomack County, Virginia* that established a predictive model for understanding the archaeological potential over the entire WFF property (NASA, 2010a).

Among the cultural resources identified at WFF in the CRA are six archaeological sites, four of which are historic sites on the Main Base, but none are located within the areas of either the Preferred Alternative or Alternative One. Neither the Preferred Alternative location nor the location of Alternative One is within an area modeled to have an increased sensitivity for archaeological resources. In a letter dated December 4, 2003, the Virginia Department of Historic Resources (VDHR) concurred with the findings of the CRA and accepted the predictive model for archaeology at WFF (NASA, 2005).

3.11.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore cultural resources would not be impacted.

Preferred Alternative, either phasing option

No structures would be impacted by either of the Preferred Alternative phased approaches. The proposed Badge Office site would be located in a well established forest with minimal potential for archaeological sensitivity. However, if unanticipated archaeological artifacts or remains should be identified during construction of the new Badge Office, the contractor shall halt work and immediately contact the WFF Facility Historic Preservation Officer who would then consult with the VDHR to determine the significance of the resource and the effects of the undertaking on the resource, and to identify the appropriate avoidance or mitigation measures.

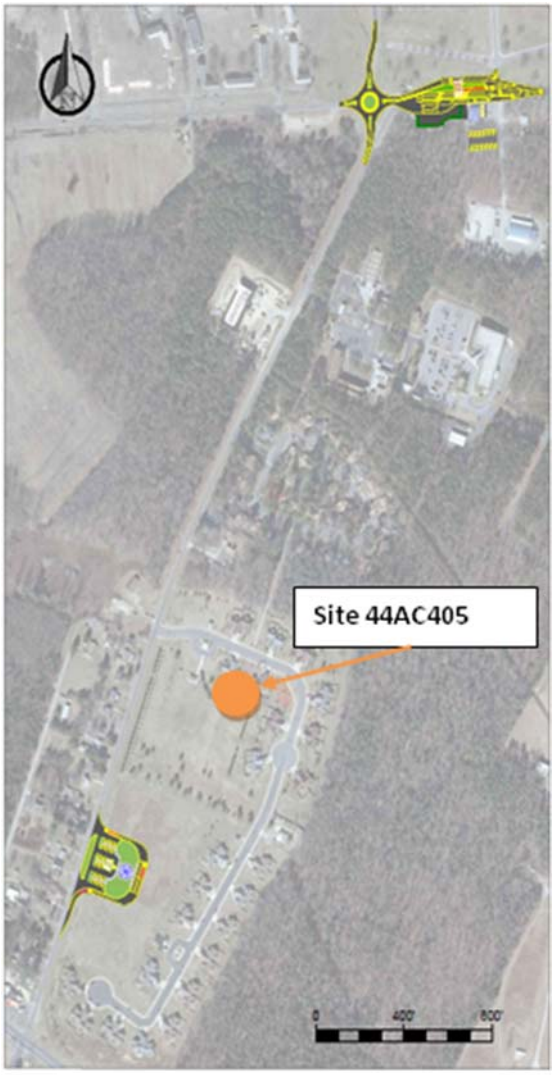

Figure 3-4 Site 44AC405

Alternative One

No structures would be impacted by Alternative One. Alternative One proposes a new Badge Office be built further south on Atlantic Road in comparison to the Preferred Alternative Badge Office location. This area, which is currently an open field, has previously been surveyed for archaeological significance. In 1990, the Navy proposed to construct additional housing units on the southern portion of the Main Base. During the EA process for this construction, the Chesapeake Division of the Naval Facilities Engineering Command conducted a phase I archaeological survey of approximately 25 hectares (60 acres) on the southwestern portion of the Main Base, including the area of Alternative One. Site 44AC103 (directly north of the Navy's proposed project site, Figure 3-2), the Matthews House (VDHR ID# 01-0155), ca. 1788, had been identified previously in the southeastern portion of WFF. The Matthews House was a late 18th century domestic site and associated grave/cemetery that was disturbed by the Navy in the

1950s during construction of the runway in the southeastern portion of the Main Base. Although the house had been removed, it was unknown at the time of the EA if intact or undisturbed archaeological deposits related to the house remained at the site. The phase I investigation included surface survey and a program of shovel test pits. One archeological site, 44AC405, was identified during the investigation. Located in a cultivated field, this artifact scatter may be associated with site 44AC103, as this was probably a farmstead during the late 18th and 19th centuries, and trash dumping in agricultural fields during these periods has been well-documented in archaeological records. The Badging Office under Alternative One would be approximately 300 meters (1,000 feet) from Site 44AC405. No impacts to this resource or other cultural resources are anticipated.

If archaeological remains are identified during construction, work would stop immediately and the WFF Facility Historic Preservation Officer would consult with the VDHR to determine the significance of the resource and the effects of the undertaking on the resource, and to identify the appropriate avoidance or mitigation measures.

3.12 Environmental Justice

3.12.1 Affected Environment

The goal of environmental justice from a Federal perspective is to ensure fair treatment of people of all races, cultures, and economic situations with regard to the implementation and enforcement of environmental laws and regulations, and Federal policies and programs. EO 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low Income Populations,* (and the February 11, 1994, Presidential Memorandum providing additional guidance for this EO) requires Federal agencies to develop strategies for protecting minority and low-income populations from disproportionate and adverse effects of Federal programs and activities. The EO is "intended to promote non-discrimination in Federal programs substantially affecting human health and the environment."

Accomack County is on the lower end of income measures in the region, with a 2009 median family income of $40,343. As a result, the county is also on the higher end of poverty levels in the region based on U.S. Census Bureau data reports. The per capita income in Accomack County in 2009 was reported to be $22,013, with an estimated 16.3 percent of people below the poverty level (U.S. Census Bureau, 2011). The per capita income in the Commonwealth of Virginia in 2009 was reported to be $31,606, with an estimated 10.1 percent of people below the poverty level statewide (U.S. Census Bureau, 2011).

To ensure compliance with Executive Order 12898, NASA prepared an Environmental Justice Implementation Plan (EJIP) in 1996. NASA evaluated the demographic information in the vicinity of WFF and identified areas that have a higher concentration of minority persons and low-income persons based on Federal guidelines. The EJIP also includes an evaluation of all

programs at WFF, including tenant activities that could potentially affect human health and the environment. The EJIP demonstrates that NASA will continue to incorporate environmental justice in all its activities and monitor all programs to determine any potential environmental justice impacts on persons in the area. Tables 3-13 and 3-14 compare the 2000 Census Tract minority and poverty data, respectively, to Accomack County and Commonwealth of Virginia Census data to show how the areas around WFF measure up to these larger-scale benchmarks.

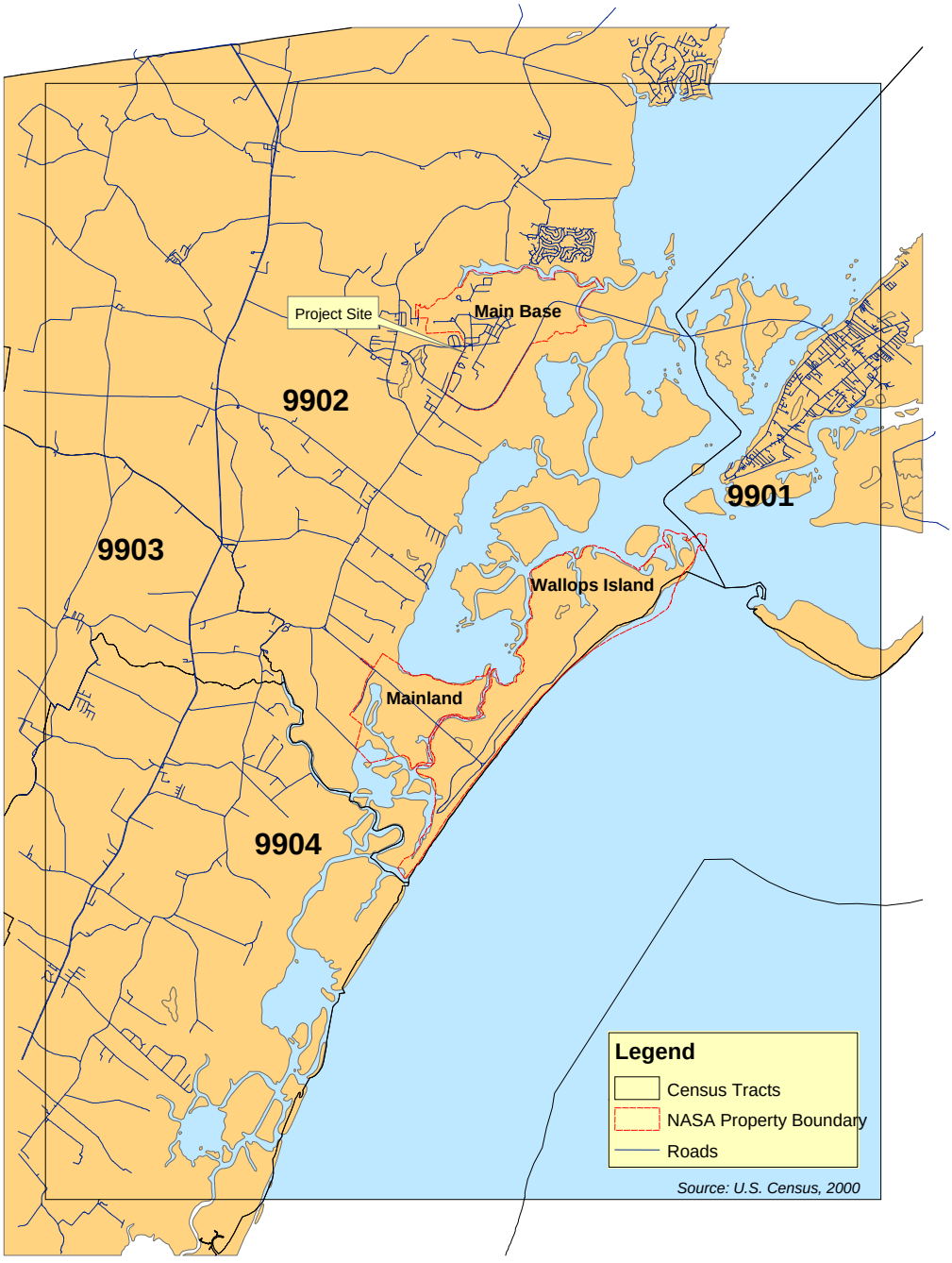

Figure 3-5: Accomack County census tracts in the vicinity of WFF

Table 3-13: Minority population data – by census tract, Accomack County, VA

Tract	Location	Percent Minority, 2000[1]	Compared to Accomack County (39.3%, 2009)[2]	Compared to Virginia (33.7%, 2009)[2]
9901	Maryland/Virginia line south including Fisher's Point (includes Chincoteague)	1.97	Lower than County	Lower than State
9902	Maryland/Virginia line south including Wallops Island to Assawoman Inlet (includes WFF)	41.75	Higher than County	Higher than State
9903	West of 9902 and 9904, Maryland/Virginia line south to Ann's Cove Road	24.66	Lower than County	Lower than State
9904	East of Mears Station Road, South of 9902 south to Horseshoe Lead	59.14	Higher than County	Higher than State

Sources:
[1]NASA, 2008
[2]U.S. Census Bureau, 2011

Table 3-14: Poverty data – by census tract, Accomack County, VA

Tract	Location	Percent Poverty, 2000[1]	Compared to Accomack County (20.6%, 2008)[2]	Compared to Virginia (10.2%, 2008)[2]
9901	Maryland/Virginia line south including Fisher's Point (includes Chincoteague)	12.80	Lower than County	Higher than State
9902	Maryland/Virginia line south including Wallops Island to Assawoman Inlet (includes WFF)	16.38	Lower than County	Higher than State
9903	West of 9902 and 9904, Maryland/Virginia line south to Ann's Cove Road	19.28	Lower than County	Higher than State
9904	East of Mears Station Road, South of 9902 south to Horseshoe Lead	27.14	Higher than County	Higher than State

Sources:
[1]NASA, 2008
[2]U.S. Census Bureau, 2011

The WFF Main Base is located in Accomack County Census Tract 9902. This Census Tract has a 2.27 percent and 7.87 percent higher minority population than Accomack County and Virginia, respectively. The Tract also demonstrates a 4.22 percent lower and 6.18 percent higher population below the poverty level when compared to the County and the State, respectively. Accordingly, NASA considers this tract to contain populations needing Environmental Justice consideration during project planning.

A key component of NASA's Environmental Justice program is its continuing outreach activities. During project planning, NASA regularly holds public meetings and issues announcements to ensure that members of the public are aware of upcoming activities. These announcements are published through a variety of outlets including the internet, local radio, local newspapers, and local town hall meetings. This outreach effectively ensures that people of all income and ethnicities have the opportunity to provide input on NASA's activities.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* encourages Federal agencies to consider the potential effects of Federal policies, programs, and activities on children. The closest day care centers, schools, camps, nursing homes, and hospitals are addressed within the EJIP and are greater than 3 kilometers (2 miles) from the project site.

3.12.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, implementation of the Main Entrance Reconfiguration Project would not occur; therefore, there would be no disproportionately high or adverse impacts on low-income or minority populations.

All Action Alternatives

The type and intensity of effects on minority or low-income persons from either action alternative would the same as those affecting persons of all other ethnicities or income. These effects are discussed in detail in each resource areas section in this EA, with the most notable being related to higher noise levels or temporary traffic delays during construction. In summary, any effects on minority or low-income populations would not be disproportionately high.

To ensure that members of the public are involved in planning for this project, NASA has published Notices of Availability of this Draft EA in two local newspapers, one of which is a free weekly publication. Additionally, NASA has posted copies of this Draft EA on the internet and distributed notices of availability directly to all persons living or owning property on Mill Dam or Atlantic Roads such that they are aware of this proposal and have the opportunity to comment on it.

4 Cumulative Effects

The CEQ defines cumulative effects as the "impact on the environment which results from the incremental impact of the action(s) when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1500). Sections 3.1 – 3.12 of this EA describe the potential impacts from the Proposed Action evaluated for the Main Entrance Reconfiguration Project. Cumulative effects can result from actions that overlap spatially and temporally. Past, present, and reasonably foreseeable future actions that may result in cumulative effects when combined with the Main Entrance Reconfiguration Preferred Alternative are described below.

4.1 Wallops Main Base

From colonization to World War II, the area of the Main Base had been farm and woodlands. During World War II, the Navy took over the property and established the Chincoteague Naval Auxiliary Air Station, primarily as a training field for naval aviation. NASA acquired the facility in June 1959, and has expanded facilities since then. Currently, the Main Base comprises 720 hectares (1,800 acres), approximately 240 hectares (600 acres) of which are impervious surfaces covered by offices; laboratories; radar antennas, maintenance and service facilities; an airport with air traffic control facilities, hangars, runways, aircraft maintenance, and ground support buildings; and tenant administration buildings and housing (NASA, 2005). Roads, parking areas, airfield, and the water and sewage treatment plants, are interconnected with storm drainage systems. All of which have impacted the topography, drainage, land use, wetlands, surface water, and biological resources of the Main Base area.

4.2 Wallops Research Park

The goal of the WRP project is to create an integrated business park for aerospace research and development programs, scientific research, commercial space industries, and educational centers. Development of the WRP is taking place adjacent to the Main Base over an expected 20-year period; some development has occurred, but the majority of the Proposed Action has not yet been constructed. WRP would consist of a multi-use development created for non-retail commercial, government space, science research, educational facilities, and public recreation areas. Please refer to the 2008 WRP EA for more information (NASA, 2008b).

4.3 Residential Developments

Several residential developments are planned for construction or being constructed within Accomack County. The closest development to the Main Entrance Reconfiguration site is an 81 hectare (201 acre), 99-lot subdivision called Olde Mill Pointe that is located on the opposite side of Little Mosquito Creek to the northwest of the Main Base. Other residential projects include Historic Corbin Hall at Chincoteague Plantation that is located on Chincoteague Bay approximately 1.6 kilometers (1 mile) north of the Main Base and encompasses approximately

60 hectares (150 acres), and Captain's Cove which is also located on Chincoteague Bay and is approximately 4.8 kilometers (3 miles) north of the Main Base.

4.4 Potential Cumulative Impacts

Below is a description of the potential cumulative impacts for each resource area that could be adversely impacted by the development of the Main Entrance Reconfiguration Preferred Alternative when combined with the potential impacts from development of the WRP and on-going development within Accomack County and the Chincoteague Bay watershed.

4.4.1 Water Resources

Agricultural runoff contributes to water quality degradation, and although commercial and residential areas make up less than 3 percent of the watershed surrounding WFF, they contribute to water quality degradation via sedimentation and stormwater runoff. The watershed around WFF is primarily agricultural and marshlands with agricultural runoff being a primary contributor to water quality degradation. Effects of these activities include burial of shellfish from sediment runoff and an increased risk of harmful algal blooms from excess nutrients, which can eventually lead to a reduction in dissolved oxygen content.

Past, present and proposed actions at WFF would cumulatively affect the amount and patterns of stormwater runoff due to increases in impervious surfaces and changes in drainage. Additionally, construction activities including grading, clearing, filling, and excavation for future projects would result in disturbance of the ground surface and would have the potential to cause soil erosion and the subsequent transport of sediment or nutrients into waterways via stormwater.

NASA has and would continue to minimize impacts on water quality by acquiring construction and industrial VSMP permits and by developing and implementing site-specific SWPPP and E&SC plans prior to land disturbing activities. Although activities within the local watersheds (agricultural runoff, sedimentation) result in water quality degradation of the areas surrounding WFF, the Main Entrance Reconfiguration project would result in minor, temporary impacts on water quality. Therefore, no long-term adverse cumulative impacts on surface waters from stormwater runoff would occur when the Main Entrance Reconfiguration project activities are considered in combination with other WFF projects and non-NASA development and agricultural activities within the surrounding watershed, which can be expected but not quantified. Additionally, Accomack County recently passed the Chesapeake Bay Protection Act which established buffer restrictions on the Atlantic Ocean side of the Eastern Shore, requiring setbacks and reductions in vegetation clearing that will produce long-term benefits to water quality.

4.4.2 Air Quality

Construction activities have the potential to cause temporary, short-term air quality impacts due to the operation of fossil-fuel burning equipment. When combined with other air quality impacts as a result of construction activities within the attainment area, the Main Entrance Reconfiguration could contribute to temporary impacts to air quality.

4.4.3 Vegetation, Terrestrial Wildlife, and Migratory Birds

Long-term adverse impacts to vegetation and terrestrial wildlife and migratory birds are anticipated due to the permanent conversion of forest to developed land within the Main Entrance Reconfiguration.

Development of the WRP and the residential developments described above would likely result in losses of vegetation and habitat in the foreseeable future. However, additional loss of vegetation and habitat in the surrounding areas may occur in small amounts and cannot be accurately estimated (especially on private property). As such, cumulative impacts to vegetation as a result of future development within Accomack County, when combined with the Main Entrance Reconfiguration, are unknown at this time but are not expected to be significant.

4.5 Permits, Licenses, and Approvals

The following list of potential permits, licenses, and approvals for the Proposed Action is preliminary. The agency responsible for each is included after the identified permit, license, or required consultation. Any required permits, licenses, or approvals would be obtained prior to construction.

No Action Alternative

Under the No Action Alternative, reconfiguration of the main entrance to the Main Base would not occur; therefore, no permits, licenses, or approvals would be required.

Preferred Alternative (either phasing option) and Alternative One

- VSMP Stormwater General Permit for Construction Activities; Virginia Department of Conservation and Recreation
- Erosion and Sediment Control Plan; NASA WFF
- Stormwater Prevention Pollution Plan; NASA WFF
- Land Use Permit; Virginia DOT

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Weidenhammer, Bradley. VDOT, 2010. E-mail communication with Paul Bull. Subject: Wallops Main Gate. August 25.

6 Agencies and Persons Consulted

Copies of the Draft EA were sent to the following agencies, organizations, and individuals. Notices of availability were also sent to all residential addresses on Mill Dam Road and those along the portion of Atlantic Road north of Route 175.

Name	Organization
Federal Agencies	
Ms. Barbara Rudnick	EPA, Region III
Ms Trish Kicklighter	NPS Assateague Island National Seashore
Mr. Doug Crawford	NOAA, Command and Data Acquisition Station
Mr. Steven Gibson	USACE Norfolk District
LT Mark Merriman	USCG Chincoteague Group
CDR John Keegan	U.S. Navy, Surface Combat Systems Center
Mr. Louis Hinds, III	USFWS Chincoteague National Wildlife Refuge
Ms. Cindy Schulz	USFWS Virginia Field Office
State Agencies	
Mr. Richard Baldwin	Mid-Atlantic Regional Spaceport
Ms. Ellie Irons	VDEQ, Office of Environmental Impact Review
Local Government	
Mr. Steven Miner	Accomack County Administration
Mr. Grayson Chesser	Accomack County Board of Supervisors
Ms. Wanda Thornton	Accomack County Board of Supervisors
Mr. Ronald Wolff	Accomack County Board of Supervisors
Mr. David Fluhart	Accomack County Building and Zoning
Ms. Elaine Meil	Accomack-Northampton Planning District Commission
Mr. Robert Ritter	Town of Chincoteague, Virginia
Mayor John Tarr	Town of Chincoteague, Virginia
Other Organizations & Individuals	
Ms. Kathy Phillips	Assateague Coastal Trust

Name	Organization
Mr. Nick Olmstead	BaySys Technologies, Inc.
Ms. Suzanne Taylor	Chincoteague, Virginia Chamber of Commerce
Mr. Denard Spady	Citizens for a Better Eastern Shore
Mr. Jim Rapp	Delmarva Low Impact Tourism Experiences
Ms. Jean Hungiville	Eastern Shore Chamber of Commerce
Mr. Peter Bale	Eastern Shore Defense Alliance
Ms. Donna Bozza	Eastern Shore of Virginia Tourism Commission
Ms. Amber Parker	Marine Science Consortium
Mr. Dave Wilson, Jr.	Maryland Coastal Bays Program
Mr. Joseph Fehrer	The Nature Conservancy
Mr. Stephen Parker	The Nature Conservancy, Virginia Coast Reserve
Mr. Randy Fox	Trails End Campground
Federal & State Elected Officials	
Honorable Mr. Lynwood Lewis, Jr.	Virginia House of Delegates
Honorable Mr. Ralph Northam	Virginia Senate

7 Preparers and Contributors

Name	Education and Experience	Areas of Responsibility in EA
URS (Contractor to NASA)		
Shari Silbert	Environmental Scientist, B.S. Chemistry, B.S. Biology, 16 years experience	NEPA Project Manager, Document Development and Review
Valerie Speidel	Environmental Analyst/Specialist, M.S. Food Science and Technology, 7 years experience	Document Development and Review
NASA		
Paul Bull	Civil Engineer, BS Civil Engineering, Master of Engineering (Civil), P.E., 16 years experience	Project Manager, Development of Alternatives, Document review
Joshua Bundick	Environmental Protection Specialist, B.A. Environmental Sciences; 8 years experience	NEPA Manager, Alternatives Screening, Document Review, Biological Resources, Cumulative Impacts
David Adams	Supervisory Security Specialist, 19 years experience	Development of Alternatives, Document review

Appendix A

Federal Consistency Determination

FEDERAL CONSISTENCY DETERMINATION
MAIN ENTRANCE RECONFIGURATION PROJECT

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER
WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

Introduction

This document provides the Commonwealth of Virginia with the National Aeronautics and Space Administration's (NASA) Consistency Determination under Coastal Zone Management Act Section 307(c)(1) and Title 15 Code of Federal Regulations (CFR) Part 930, Subpart C, for implementation of the Main Entrance Reconfiguration Project at NASA's Goddard Space Flight Center's Wallops Flight Facility (WFF), located in Accomack County on the Eastern Shore of Virginia. The information in this Consistency Determination is provided pursuant to 15 CFR Section 930.39.

NASA has prepared an Environmental Assessment (EA) to evaluate the potential environmental impacts from the proposed Main Entrance Reconfiguration Project in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S. Code 4321-4347), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), NASA's regulations for implementing NEPA (14 CFR Subpart 1216.3), and the *NASA Procedural Requirements (NPR) for Implementing NEPA* and *Executive Order (EO) 12114* (NPR 8580.1).

Under the Preferred Alternative, NASA is proposing to reconfigure the main entrance to the Main Base in either a two- or four-phased approach to alleviate safety concerns created by the current layout. The proposal includes construction of a badge office and visitor parking area, security personnel parking area, truck inspection area, guard house and canopy, traffic roundabout, and consolidated Shipping and Receiving Facility.

Summary of Effects to Resources

NASA has determined that the Main Entrance Reconfiguration Project would affect the land or water uses or natural resources of Virginia. The corresponding section of the EA is referenced if more detailed information is desired.

Soils (EA §3.1.2) – The United States Department of Agriculture's Soil Survey assigns the project sites' soil type ratings of "low" and "medium" for hazard of water and wind erosion, respectively. Accordingly, soils could be transported off-site during construction by wind or precipitation during storm events. However, as the soils within the sites are gently sloped and as NASA would implement strict erosion and sediment controls, it is expected that any losses would be minor.

Water Resources (EA §3.2.1 and 3.2.2) – No long-term adverse impacts to stormwater conveyance are anticipated because NASA would incorporate permanent stormwater control measures into design plans. Measures could include integrating grass swales around newly paved parking lots, which would slow the flow of stormwater and promote runoff infiltration into the surrounding soils. All control measures to reduce stormwater-carried nonpoint source pollution would be designed and constructed in accordance with Virginia Stormwater Management Program laws and regulations. Additionally, stormwater would flow through approximately 2.5 kilometers (1.5 miles) of vegetated swale to reach the receiving water, an unnamed branch of Little Simoneaston Creek. With the exception of severe storm events, all stormwater from the site would infiltrate into the swale before reaching the receiving water. No impacts would occur on surface waters or wetlands.

Air Quality (EA §3.3) – During construction, site-specific dust suppression methods would be implemented to minimize windblown and vehicular-borne fugitive dust generated from the construction site areas (e.g., daily watering of disturbed surfaces and soil stockpiles, covering stockpiles, implementing track-out controls). Vehicles and equipment used for construction would be maintained in good working order. Effective June 2010, non-road diesel engines are required by law to utilize ultra low-sulfur diesel, which must meet a 15 parts per million (ppm) sulfur maximum. Additionally, idling of construction equipment would be prohibited when feasible. Construction-related impacts are expected to be short-term and limited to the duration and area of the construction activities.

Climate Change (EA §3.4) – Construction equipment usage, asphalt paving, and tree removal would all result in greenhouse gas (GHG) emissions. It is anticipated that GHG emissions from this project would be transient and have a negligible adverse impact on global warming.

Noise (EA §3.5) – Construction activities (tree clearing, grading, paving, etc.) for reconfiguring the main entrance have the potential to generate temporary increases in noise levels. NASA would comply with local noise ordinances and State and Federal standards and guidelines for potential impacts on humans caused by construction activities. No significant noise-producing activities would be routinely conducted before 7:30 a.m. or after 4:30 p.m., typical hours of construction. Any activities outside of typical work hours that could create disruptive noise levels would be coordinated directly with the persons affected by the planned activity.

Hazardous Materials and Hazardous Waste Management (EA §3.6) – Construction activities would include the use of hazardous materials and may generate hazardous waste (i.e., solvents, hydraulic fluid, oil, and antifreeze) from the construction equipment. With implementation of safety measures and proper procedures for the handling, storage, and disposal of hazardous materials and wastes during construction activities, no adverse impacts are anticipated during construction. In addition, NASA would require a site-specific Stormwater Pollution Prevention Plan to be developed prior to the start of construction activities that would adhere to WFF's

Integrated Contingency Plan and contain Best Management Practices (BMPs) related to spill prevention and clean-up procedures for hazardous materials and waste.

Vegetation (EA §3.7) – Long-term adverse impacts to vegetation would be anticipated due to the permanent conversion of forest to developed land. The Preferred Alternative would result in the maximum loss of approximately 1.4 hectares (3.48 acres) of trees. All land clearing activities would be performed in accordance with applicable laws and regulations and would utilize appropriate BMPs. Since the majority of the area cleared would be paved, little revegetation would be possible. Aesthetics would be maintained through planting native landscaping and grasses on any remaining bare soil. Vegetation growth would be monitored until well established.

Terrestrial Wildlife and Migratory Birds (EA §3.8) – Short-term adverse impacts to wildlife and migratory birds may be anticipated during construction activities due to temporary noise disturbances, especially during spring and fall migrations; however most of the area surrounding the proposed project site is developed and is currently affected by human-related noise including the Main Base airfield. Current existing noise disruption caused by WFF operations are of low frequency and short duration. The permanent removal of approximately 1.40 hectares (3.48 acres) of trees would adversely affect wood-dwelling species. However, given the amount of suitable habit nearby, impacts would not be substantial.

Transportation (EA §3.10) – Temporary impacts to traffic flow would occur during construction activities due to an increase in the volume of construction-related traffic on roads in the immediate vicinity of the proposed project site. Traffic lanes may be temporarily closed or rerouted during construction and paving, and construction equipment and staging could interfere with pedestrian and vehicle flow. NASA would coordinate all transportation activities that would have the potential to affect public roads, including closures, traffic control, safety issues, etc. with Accomack County and the Virginia Department of Transportation Accomack Residency Office.

Cultural Resources (*EA §3.11)* – No structures would be impacted by the Preferred Alternative. The proposed Badge Office site would be located in a well established forest that is not in an area previously modeled to have an increased potential for archaeological sensitivity. However, if unanticipated archaeological artifacts or remains should be identified during construction of the new Badge Office, the contractor shall halt work and immediately contact the WFF Facility Historic Preservation Officer who would then consult with the Virginia Department of Human Resources to determine the significance of the resource and the effects of the undertaking on the resource, and to identify the appropriate avoidance or mitigation measures.

Cumulative Impacts (EA §4) – Minor adverse cumulative impacts are anticipated on water resources, air quality, vegetation, terrestrial wildlife, and migratory birds**.**

Consistency Determination

The Virginia Coastal Resources Management Program contains the following applicable enforceable policies:

- **Fisheries Management**. Administered by the Virginia Marine Resource Commission (VMRC), this program stresses the conservation and enhancement of shellfish and finfish resources and the promotion of commercial and recreational fisheries.
- **Subaqueous Lands Management.** Administered by VMRC, this program establishes conditions for granting permits to use State-owned bottomlands.
- **Wetlands Management.** Administered by VMRC and the Virginia Department of Environmental Quality (VDEQ), the wetlands management program preserves and protects tidal wetlands.
- **Dunes Management.** Administered by VMRC, the purpose of this program is to prevent the destruction and/or alteration of primary dunes.
- **Non-point Source Pollution Control.** Administered by the Virginia Department of Conservation and Recreation, the Virginia Erosion and Sediment Control Law is intended to minimize non-point source pollution entering Virginia's waterways.
- **Point Source Pollution Control.** Administered by the State Water Control Board, the National Pollutant Discharge Elimination System permit program regulates point source discharges to Virginia's waterways.
- **Shoreline Sanitation.** Administered by the Department of Health, this program regulates the installation of septic tanks to protect public health and the environment.
- **Air Pollution Control.** Administered by the State Air Pollution Control Board, this program implements the Federal Clean Air Act through a legally enforceable State Implementation Plan.
- **Coastal Lands Management.** Administered by the Chesapeake Bay Local Assistance Department, the Chesapeake Bay Preservation Act guides land development in coastal areas to protect the Chesapeake Bay and its tributaries.

Based upon the following information, data, and analysis, NASA finds that the proposed Main Entrance Reconfiguration Project activities are consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Resources Management Program. The table below summarizes NASA's analysis supporting this determination:

Virginia Policy	Consistent?	Analysis
Fisheries Management	Yes	No Impacts.
Subaqueous Lands Management	Yes	No Impacts.
Wetlands Management	Yes	No Impacts.
Dunes Management	Yes	No Impacts.
Non-point Source Pollution Control	Yes	All control measures to reduce stormwater-carried nonpoint source pollution would be designed and constructed in accordance with Virginia Stormwater Management Program (VSMP) laws and regulations. NASA would obtain a VSMP permit and develop a site-specific Stormwater Pollution Prevention Plan prior to construction.
Point Source Pollution Control	Yes	No Impacts.
Shoreline Sanitation	Yes	No Impacts.
Air Pollution Control	Yes	Construction equipment usage, asphalt paving, and tree removal would all result in emissions. NASA would minimize adverse impacts to air quality by implementing best management practices. The project would not violate Federal or Virginia air quality standards.
Coastal Lands Management	Yes	No Impacts.

Pursuant to 15 CFR section 930.41, the Virginia Coastal Resources Management Program has 60 days from the receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR Section 930.41(b). Virginia's concurrence will be presumed if its response is not received by NASA on the 60th day from receipt of this determination. The Commonwealth's response should be sent to:

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