

FINAL
ENVIRONMENTAL ASSESSMENT
OF THE GENERAL PLAN AND MAINTENANCE OF
PATRICK AIR FORCE BASE, FLORIDA



United States Air Force, 45th Space Wing
Patrick AFB, FL

Report Documentation Page

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**FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)**

**General Plan and Maintenance
Patrick Air Force Base, FL**

Pursuant to the Council on Environmental Quality regulations, the provisions of the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Parts 1500-1508, and 32 CFR 989, *Environmental Impact Analysis Process* (EIAP), the U.S. Air Force (USAF) conducted an assessment of the potential environmental consequences of the Proposed Action to implement the Patrick Air Force Base (PAFB) General Plan (GP) for base sustainability in support of the 45th Space Wing (45 SW) mission. The Environmental Assessment (EA) for the PAFB GP, attached to this finding, considers the potential impacts of the Proposed Action and alternatives on the natural and human environments. The following documents are used to support the FONSI conclusion, and are incorporated by reference:

- *Amended Environmental Assessment for the Construction of the United States Air Force Technical Applications Center at Patrick AFB, FL*. U.S. Air Force, AFTAC. November 2010;
- *Environmental Assessment for the Implementation of the Integrated Natural Resources Management Plan, 45th Space Wing (properties), FL*. U.S. Air Force, 45th Space Wing. September 2008;
- *Environmental Assessment for the Beddown of the 920th Rescue Wing at Patrick AFB, FL*. U.S. Air Force, 920th Rescue Wing. December 2005;
- *Environmental Assessment for the General Plan and Maintenance of Patrick AFB, FL*. U.S. Air Force, 45th Space Wing. May 2005.

These documents may be accessed by request through Ms. Keitha Dattilo-Bain, 45th Space Wing Civil Engineer Squadron, Email: keitha.dattilobain@us.af.mil. This FONSI/FONPA was made available to the affected public for a 30-day public comment period by placement on file in the local public library, Satellite Beach, through advertisement placed in the *Florida Today*. No public comments were received.

Proposed Action and Alternatives: The Proposed Action is to implement the PAFB General Plan and two projects in the South Housing Area in support of the 45th Space Wing mission. The EA addresses facility maintenance, repair, demolition, and construction as well as utility projects and general base maintenance and repair including grounds and landscaping projects proposed to occur in the next five years. Alternatives to the Proposed Action and the No-Action Alternative are discussed in the attached EA.

Summary of Findings: The analyses of the affected environment and environmental consequences of implementing the Proposed Action presented in the attached EA concluded that no significant adverse effects will result. No significant adverse cumulative impacts will result from activities associated with General Plan projects when considered in conjunction with recent, past, and future projects within the project areas.

Eight areas of environmental consequences evaluated in the EA were determined to have the potential to result in minor impacts.

Air Quality: Proposed project activities will be expected to produce short-term, intermittent air quality impacts from fugitive emissions (particulate matter) and other criteria air pollutants (nitrogen oxides, carbon monoxide, and sulfur dioxide) during construction activities from project equipment and vehicles. Emissions of ozone depleting substances and greenhouse gases will be negligible, but will represent a small, incremental addition to the global atmosphere.

Biological Resources: Federally protected sea turtles, manatee, and wood stork may be affected by the Proposed Action, however, no significant adverse impacts are anticipated to any listed or candidate species or their habitat nor will any policies or regulations related to listed species be violated.

Cultural Resources: Several facilities eligible for the *National Register of Historic Places*' listing as World War II and Cold War assets will be affected by the Proposed Action. Consultation with the State Historic Preservation Office (SHPO) identified that demolition of potentially eligible historic resources will be considered an adverse effect, however, sufficient documentation had been received for Facilities 1322, 1327, 1330, 1425, 1432, 1437 and 1440, thereby mitigating impacts to insignificant (Section 4.3 and Appendix C). Facilities 407, 515, 522, 523, 524, 533, 739, 912, 938, 948, 960, and 980 have been accepted for demolition because they do not meet the criteria for listing on the *National Register*. Eligible facilities (313, 408, 410, 557, 559, 560, and 3650)

proposed for demolition will require case-by-case review and case studies identifying alternatives that may avoid or minimize adverse effects; these facilities have been discussed in the attached EA as related to PAFB GP proposed actions, but must be analyzed at a later date in a supplemental EA after proposed mitigation has been accepted by the SHPO.

Geology and Soils: No significant impacts are anticipated.

Safety and Health: No significant impacts are anticipated.

Infrastructure and Transportation: A slight increase of electrical use will be anticipated due to the proposed infrastructure construction, repair and demolition projects; traffic congestion on base may increase with multiple projects being proposed each year over the five years; however, no significant impacts are anticipated.

AICUZ and Land Use: The Proposed Action has been deemed consistent with the Florida Coastal Management Program per concurrence by the Florida Department of Environmental Protection, and proper permitting will be developed as advised by State regulatory agencies during review (Appendix D). No significant impacts are expected.

Water Resources: Minor, but not significant, impacts will result as greater amounts of impervious surfaces will be created for buildings and parking from the Proposed Action which will lead to requirements for improved retention and stormwater treatment for increased runoff.

Mitigations: The USFWS BO (FWS 41910-2009-F-0087) and USFWS and SHPO letters found at Appendices B and C of the attached EA describe the mitigations associated with the proposed action. These mitigations are also found in Sections 4.2 and 4.3 of the EA. These mitigations are necessary to reach a determination that an EIS is not required, and we commit to performing them before proposed actions commence.

Practicable Alternatives: Executive Order (EO) 11988, *Floodplain Management*, directs each federal agency to provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for federally undertaken construction and improvement projects. This FONSI/FONPA meets the requirement in the EO 11988. EO 11990, *Protection of Wetlands*, directs each federal agency to provide leadership and take action to minimize destruction, loss or degradation of wetlands. The proposed actions will not cause significant adverse impacts to wetlands.

No other practicable alternatives exist to conducting facility and grounds repairs and maintenance within the 100-year floodplain where assets currently exist; nor are there practicable alternatives to improved recreation, beach and river access without implementing activities within the floodplain.

Finding of No Practicable Alternative

Based upon my review of the facts and analyses contained in the attached EA and pursuant to Executive Orders 11990 and 11988, the authority delegated by SAFO 780-1, and 32 CFR Part 989, I find that there are no practicable alternatives to this action that will occur adjacent to wetlands, and within the 100-year floodplain and that all practicable measures will be used to minimize harm to or within the floodplain.

Finding of No Significant Impact

Based upon my review of the facts and analyses contained in the attached EA, conducted in accordance with the provisions of NEPA, the CEQ Regulations, and 32 CFR 989, and with the proviso that all mitigations noted above will be undertaken, I conclude that the Proposed Action will not have a significant environmental impact, either by itself or cumulatively with other ongoing projects at PAFB, will not involve an element of high risk or uncertainty on the human environment, and its effects on the quality of the human environment are not highly controversial. Accordingly, an Environmental Impact Statement is not required. The signing of this FONSI/FONPA completes the environmental impact analysis process.


JOSEPH H. SCHWARZ, Colonel, USAF
Deputy Director for Installations
and Mission Support

17 July 2012
Date

Acronyms and Abbreviations

45 SW	45th Space Wing
45 CES/CEAO	Asset Management (Planning Function)
AAFES	Army Air Force Exchange Service
ACM	Asbestos-Containing Material
ADP	Area Development Plan
AF	United States Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
AFSPC	Air Force Space Command
AFTAC	Air Force Technical Application Center
AICUZ	Air Installation Compatible Use Zone
AIR	Airfield
AOC	Area of Concern
APZ	Accident Potential Zone
AQCRs	Air Quality Control Regions
AST	above-ground storage tank
BACT	best available control technologies
BASH	Bird Aircraft Strike Hazard
BCE	Base Civil Engineering
BMPs	Best Management Practices
BO	Biological Opinion
C&D	Construction and Demolition
CAA	Clean Air Act
CCAFS	Cape Canaveral Air Force Station
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIP	Capital Improvements Program
CNCC	Consolidated Network Communications Control
CO	carbon monoxide
COE	U.S. Army Corps of Engineers
CPG	Comprehensive Procurement Guidelines
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dB	decibel
dBA	“A-weighted” logarithmic scale
DLA	Defense Logistics Agency
DoD	Department of Defense
EA	Environmental Assessment
EDB	ethylene dibromide
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPCRA	Emergency Planning and Community Right to Know Act

EPHA	Emergency Preparedness Hazards Assessment
ER	Eastern Range
ERP	Environmental Resource Permit
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FAMCAMP	Family Camping
FB	Facilities Board
FCR	Fire Crash Rescue
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FEMP	Federal Energy Management Program
FIRM	Flood Insurance Rate Map
FLANG	Florida Air National Guard
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FP&L	Florida Power and Light
GHGs	greenhouse gases
gpcd	gallons per capita per day
GPP	Green Purchasing Program
HAPs	hazardous air pollutants
HF	High Frequency
HID	high intensity discharge
HVAC	heating, ventilation, & air conditioning
IAW	in accordance with
INRMP	Integrated Natural Resources Management Plan
IRL	Indian River Lagoon
IRP	Installation Restoration Program
kV	kiloVolt
LAs	Limited Areas
LAN	Local Area Network
LEED	Leadership in Energy and Environmental Design
LMP	Light Management Plan
LMR	Land Mobile Radio
LOX	Liquid Oxygen
MAN	Metropolitan Area Network
MBES	Mid-Base East Support
MBMR	Mid-Base Military Recreational
MBRI	Mid-Base River Industrial
MBTA	Migratory Bird Treaty Act
MBTU	million british thermal units
MC	Minor Construction
MFH	Military Family Housing
MGD	million gallons per day
MILCON	Military Construction
MSA	Magnuson Stevens Fisheries Management Act
MSDS	Material Safety Data Sheet
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards

NAF	Non-Appropriated Funds
NAGPRA	Native American Graves Protection and Repatriation Act
NBA	North Base Administration
NBR	North Base Residential
NEPA	National Environmental Policy Act
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
NOx	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
ODCs	ozone depleting chemicals
OPLAN	Operating Plan
OSHA	Occupational Safety and Health Administration
PAFB	Patrick Air Force Base
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PM	particulate matter
POV	Privately Owned Vehicle
PPAs	Property Protection Areas
PPE	personal protective equipment
PPM	parts per million
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
RCRA	Resource Conservation and Recovery Act
RMDF	Recovered Materials Determination Form
SAFMC	South Atlantic Fishery Management Council
SAR	Small Arms Range
SAV	submerged aquatic vegetation
SBCS	South Base Community Support
SBR	South Base Residential
SHPO	State Historic Preservation Officer
SJRWMD	St. John's River Water Management District
SO2	sulfur dioxide
SR A1A	State Road A1A
SSC	Species of Special Concern
SVOCs	semi-volatile organic compounds
SWI	Space Wing Instruction
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Program
T&E	Threatened and Endangered
TDS	Total Dissolved Solids
TMDLs	Total Maximum Daily Loads
TPH	total petroleum hydrocarbons
TPY	tons per year
UFC/UBC	Uniform Facilities Code/Uniform Building Code
UHF	Ultra High Frequency

USACE	United States Army Corps of Engineers
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VHF	Very High Frequency
VAQ	Visiting Airmen Quarters
VOCs	volatile organic compounds
VOQs	Visiting Officer Quarters

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1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

This Environmental Assessment (EA) has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, *Environmental Impact Analysis Process*, as promulgated in Title 32 of the Code of Federal Regulations (CFR) Part 989, and Department of Defense (DoD) Directive 6050. The EA evaluates the potential environmental consequences associated with the proposed implementation of the General Plan and base maintenance activities for Patrick Air Force Base (PAFB), FL.

1.2 Background

The PAFB General Plan (PAFB GP) is the culmination of the Installation's comprehensive planning process. The PAFB GP reviews the essential characteristics and capabilities of the base and comprehensively identifies strategies for development, mission sustainment, security enhancements, and improvements to quality of life (QOL) for PAFB. The PAFB GP serves as the planning document for facility use, maintenance, demolition (when repair costs are greater than new construction), and replacement facility construction. The Commander of the 45 SW is responsible for planning and management of PAFB resources. The PAFB GP reflects the Commander's decisions regarding future development requirements. Keeping the PAFB GP up-to-date and accurate is vital to ensuring its continued usefulness. The PAFB GP is intended to be a "living document"; therefore, it will become necessary to revise it as mission, budget and other conditions generate new planning requirements. Of course, if projects significantly change then NEPA re-review will be required and supplemental EAs may be required.

1.3 Location

PAFB is located on a barrier island on the central east coast of Florida, south of the City of Cocoa Beach and north of South Patrick Shores and the City of Satellite Beach (Figure 1-1). The main base covers approximately 2,004 acres and is bounded by the Atlantic Ocean on the east and the Banana River on the west. Small parcels, consisting of approximately 36.5 acres, still remain as Air Force property in former South Housing, approximately 1-mile south of PAFB proper. There is little topographic relief across PAFB, with elevations from 0 to 13 feet above mean sea level (MSL), and highest elevations corresponding to sand dunes along the Atlantic Ocean and closed landfill cells near the southwestern boundary parallel to the Banana River. Most of the southwestern portion of PAFB was created using dredge spoil from the Banana River from the 1940s to the 1950s.

1.4 Purpose and Need for Action

The purpose of the Proposed Action is to implement PAFB's comprehensive planning process. The PAFB General Plan incorporates, as a principle planning vision, the concept of maximizing the utilization and capitalization of assets, existing and proposed, to meet the mission while maintaining sensitivity to its operational and physical requirements and working in harmony with the surrounding community. In accordance with AFI 32-7062, *Air Force Comprehensive Planning*, the General Plan is a mandatory document for assessing and planning future

installation growth. The purpose and need for individual projects proposed in the next five years follow the maps on the following pages.

The general purpose of the PAFB GP is to provide a snapshot of PAFB development over time for planned Base improvements. PAFB has been split into six distinct geographic areas with functional purpose and developmental objectives, and each was identified as an individual Area Development Plan (ADP). The PAFB ADP key and the map indicating the parcels still held by PAFB in former South Housing can be found in Figures 1-2 and 1-3 on the following pages. Short-term and long-term development within the GP process are projected to assist with the objectives of:

- Optimization of Base operations in support of the United States Air Force (USAF) and 45 SW mission;
- Preservation capabilities to accommodate future mission requirements;
- Enhancement of security and incorporation of anti-terrorism and force protection standards (AT/FP) per the Department of Defense (DoD) Instruction 2000.16, *DoD Combating Terrorism Standards*, and AFI 31-101, *The Air Force Installation Security*;
- Establishment of an efficient network of vehicular and pedestrian infrastructure;
- Sustainment of the mission through best use of land/space and maximization of energy efficient concepts in facility design;
- Improvement to Quality of Life (QOL) to ensure PAFB community satisfaction;
- Preservation of natural and cultural resources to the maximum extent practicable, and;
- Reduction of maintenance costs by leasing facilities to mission-compatible tenants on-base.

The purpose and need for each ADP (I-IV) and projects within each ADP, or discussed areas not identified in an ADP, are found after the following figures. The PAFB ADPs and other areas discussed below are: North Base Housing (I), North Base Administrative (II), Mid Base River Industrial (III), Mid Base Military Recreational (IV), Mid Base East Support (V), South Base Community Support (VI), Airfield, and former South Housing. A listing of projects per each ADP can be found in Table 2-1 in Section 2.1.1. Impact analyses for projects within each ADP in the proposed within five years are found in Section 4.0.

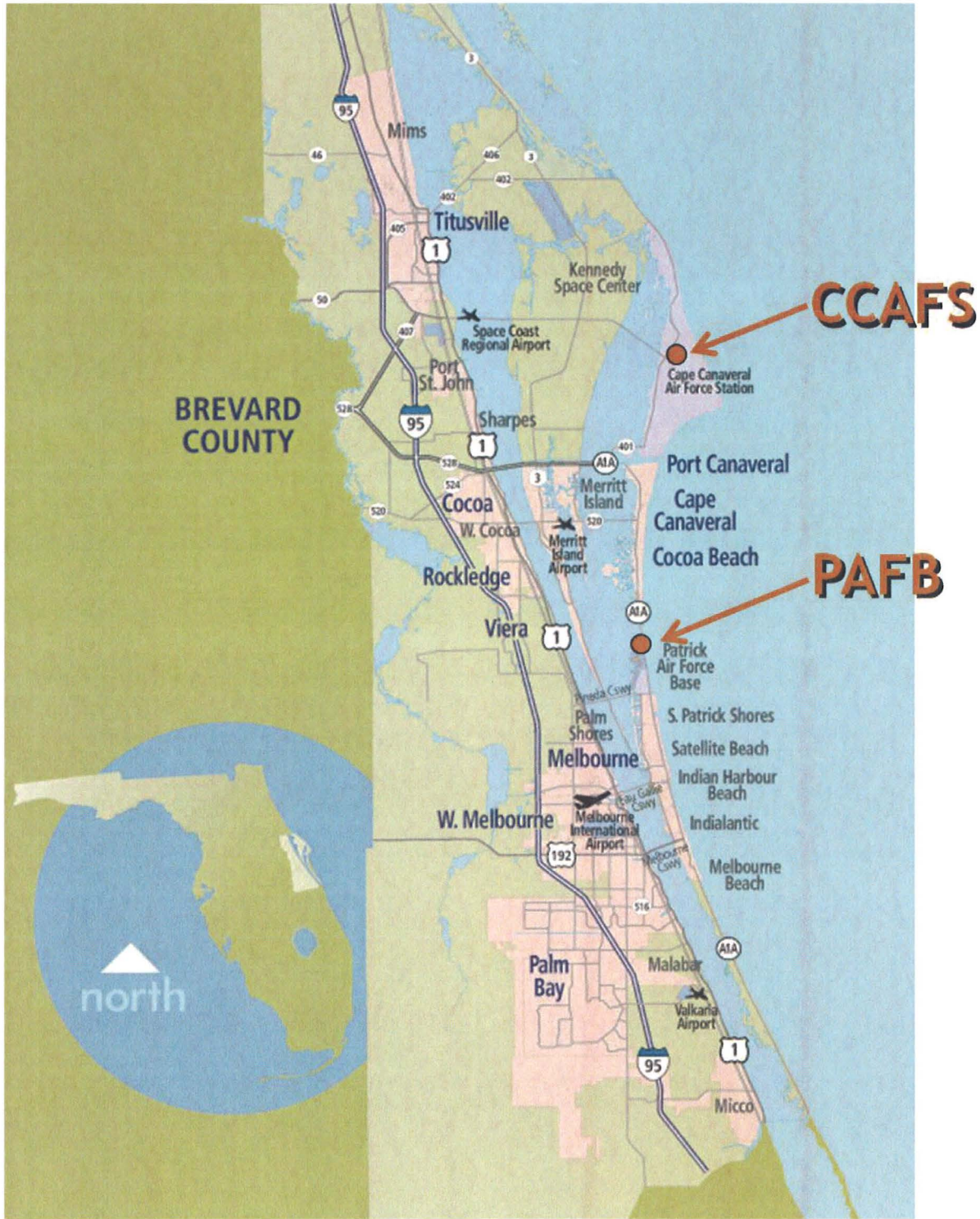


FIGURE 1-1: PAFB LOCATOR MAP

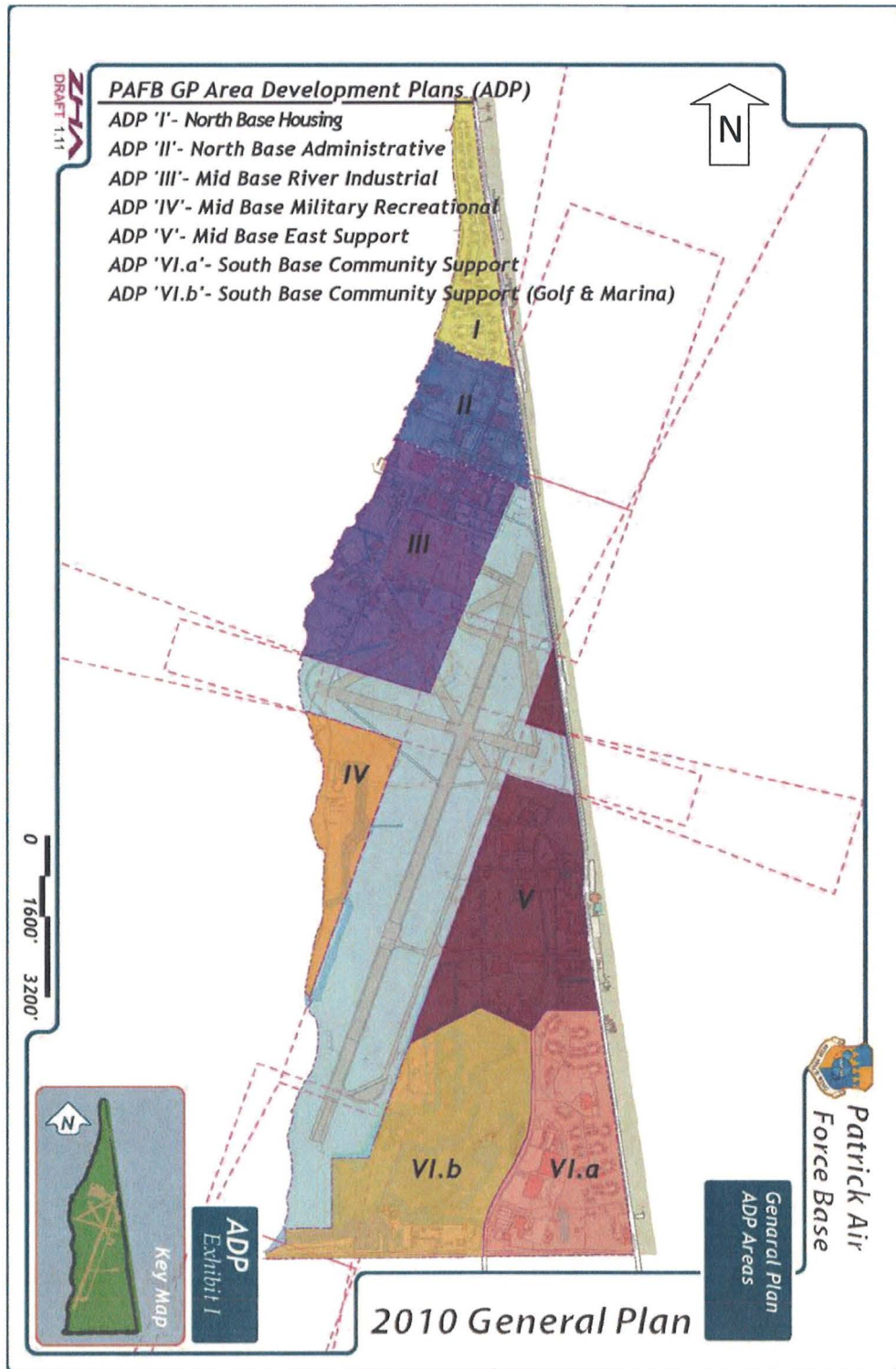


Figure 1-2: PAFB AREA DEVELOPMENT PLAN KEY

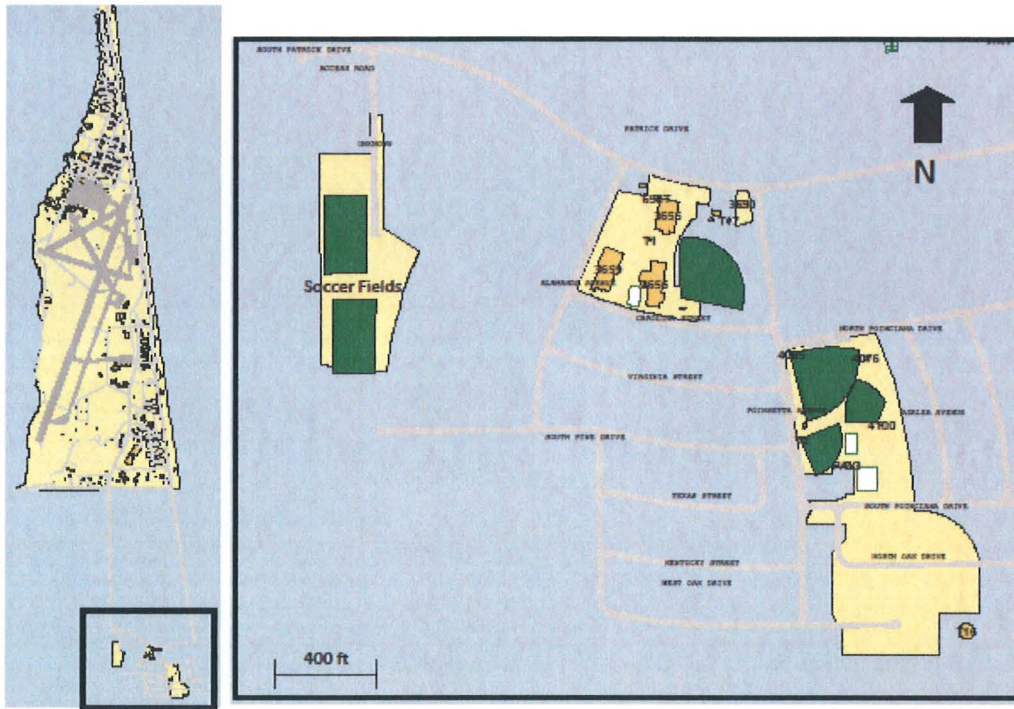


FIGURE 1-3: FORMER SOUTH HOUSING, PAFB PROPERTY DISCONTIGUOUS PARCELS

ADP I: North Base Housing

North Housing is under a privatized housing 50-year lease that began in 2008 under the Military Housing Privatization Initiative. The developer, Hunt Pinnacle, manages and maintains the PAFB North Housing area, therefore the PAFB General Plan did not include this large parcel. The overall purpose and need for maintenance and improvements of the riverside fitness and recreational paved trail (begins in ADP I and ends in ADP III) as well as expansion of the Picnic Tables Beach (also known as North Beach) area is to improve recreational and fitness amenities for enhanced quality of life (QOL) for active and retired military, Department of Defense (DoD) civilians and contractors'. Specifically, the purpose and need for improvements to the riverside trail, such as installation of benches, water fountains, and landscaping, is to maintain a safe and aesthetic route away from traffic and in a more natural setting for fitness, recreation and relaxation. In relation to development for Picnic Table Beach, the purpose and need for parking lot expansion is to correct safety issues that result as the parking lot fills up and vehicles begin to park along the very busy SRA1A which increases accident risk; lot expansion will also allow for an increase of beach access points. The purpose for new crossovers, lookout pavilions, bus stop, showers, and restrooms is to provide improved beach access and amenities for those visiting Picnic Tables Beach. The purpose for a beach equipment rental and snack bar is to provide amenities at a convenient location for improved QOL. The purpose of the drainage pipe along SRA1A for Facilities 251, 253, and 255 is to correct a deficiency caused by

improper stormwater control structures based on the need observed during past storm events where standing water made access to the outdoor recreational rental beach homes very difficult.

ADP II: North Base Administrative

The purpose and need for re-development of the PAFB northern administrative area is to provide additional space to consolidate, expand and better support existing missions and functions as well as improve security, infrastructure, and stormwater management to meet more stringent regulatory and DoD requirements. Several facilities in ADP II are proposed to be demolished, constructed, expanded or renovated. The purpose and need for demolition of facilities 407, 408 and 410 (North water tower) is to remove these unneeded facilities from the 45 SW inventory, and meet DoD cost and infrastructure reduction goals requiring a 20% reduction by 2020. Specifically, facility 408 will be replaced by a new veterinary clinic proposed in the more compatible ADP VI, South Base Community Support, where the medical facilities and military working dog kennels are found. The purpose of rehabilitating and constructing an addition to the dormitories (facilities 502, 503, 505, & 506) is to provide for more efficient and modern living quarters based on the need indicated by Airmen that have been utilizing the current facilities that are over 50 years old. The purpose and need for relocation and expansion of the PAFB Main Gate is to meet antiterrorism-force protection (AT/FP) guidelines and reduce traffic problems along SRA1A; this project will be analyzed in a separate EA once alternatives are fully defined. The purpose for expansion of the Defense Equal Opportunities Management Institute (DEOMI) is to increase square footage to allow for accommodation of greater numbers of DoD employees based on increased training requirements.

The purpose and need for development of the Beachhouse area (also known as Blockhouse Beach) and the Second Light Beach area (also known as Main Gate Beach) is to enhance QOL for active and retired military, DoD civilians, contractors and their families as well as the public. At Beachhouse Beach, the purpose and need for parking lot expansion and relocation of the traffic light is to correct traffic issues that result as the parking lot fills up and vehicles attempt to go the wrong direction which increases accident risk; lot expansion will also allow for an increase of beach access points and for increased patronage and profit for the Beachhouse club. The purpose for new crossovers, lookout pavilions, bus stop, showers, and restrooms is to provide improved beach access and amenities for those visiting Beachhouse Beach for improved QOL and the potential to increase profit calculated by the NAF outdoor recreation program. In relation to development for Main Gate Beach, the purpose and need for new crossovers, lookout pavilions, bus stop, showers, surfboard racks and restrooms is to provide enhanced beach access and amenities for those visiting Main Gate Beach for improved QOL.

ADP III: Mid Base River Industrial

The purpose and need for development of the PAFB mid-base river industrial area is to provide additional space to consolidate, expand and better support existing missions and industrial type functions as well as improve security, infrastructure, and stormwater management. The purpose and need for construction of a Consolidated Network Communications Control (CNCC) Center is to provide an updated and modern facility as the communications hub for PAFB in order to meet higher technological communications quality and current AT/FP standards and operating efficiencies. The purpose and need for demolition of facilities 515, 522, 523, and 524 is to remove unneeded and outdated facilities that must be removed to make room for the new CNCC Center; facility 533 (current communications facility) will be demolished after the CNCC

Center is constructed as it will no longer be needed. The purpose and need for demolition of facilities 557, 559, 560 and 739 is to meet safety requirements and remove facilities out of the airfield Clear Zone as well as meet DoD infrastructure and cost reduction goals requiring a 20% reduction by 2020.

The purpose and need for development of the 920th Rescue Wing (920 RQW) campus is to increase operating efficiency and sustain readiness while also modernizing facilities and improving stormwater management in this area. Development of the 920 RQW campus was analyzed in the *Environmental Assessment for the 920th Rescue Wing Beddown at PAFB, FL*, finalized December 2005. This EA did not anticipate any significant impacts, and is incorporated by reference in accordance with 40 CFR 1502.21. Changes to stormwater management areas have recently become necessary, and therefore, will be covered in this EA. The purpose and need for re-configuring stormwater management in the 920 RQW area is to correct parking lot deficiencies while providing sufficient stormwater treatment in compliance with more stringent regulations. The purpose and need for renovating the Hangar 750 aircraft ramp and repairing drainage structures for the ramp is to improve safety by replacing cracked concrete over 70 years old and preventing bird attractants near aircraft due to standing water and improper stormwater runoff. This project will be analyzed in a separate EA once alternatives are fully defined during the case study analyses required for completion of Section 10 National Historic Preservation Act consultation with the State Historic Preservation Office.

ADP IV: Mid Base Military Recreational

The purpose and need for development of the mid-base riverside recreational area is to provide updates to Chevron Park, modernization and expansion of the PAFB Family Camping Grounds (FAMCAMP), and construction of a day-use fitness/recreational trail complex to improve QOL for active and retired military, DoD civilians, contractors and their families.

ADP V: Mid Base East Support

The purpose and need for development of the mid base east area is to consolidate and expand base support functions to provide for more efficient mission support and operational controls with increased response time to emergency scenarios. The purpose and need for demolition of facilities 948 and 951 (Central water tower and pumphouse) is to remove these unneeded facilities from the 45 SW inventory, and meet DoD infrastructure and cost reduction goals requiring a 20% reduction by 2020. The purpose and need for re-configuration and expansion of the PAFB Truck Inspection Gate is to meet antiterrorism-force protection (AT/FP) guidelines and reduce traffic problems along SRA1A; this project will be analyzed in a separate EA once alternatives are fully defined. The purpose and need for construction of a new Fire Crash Rescue Station is to provide a modern, high tech fire fighting facility to replace an over 60 year old fire station (facility 810 will be demolished) that has sustained damage over the years due to its age and storm events as well as provide more effective emergency response. The purpose and need for a Vehicle Maintenance Complex is to consolidate vehicle operations that are occurring in four facilities in locations all over PAFB, and provide more inclusive on-base vehicle maintenance and reduce costs associated with taking government vehicles to off-base services. The purpose and need for a Civil Engineering (CE) Complex is to consolidate CE functions and provide more efficient operational support and functional storage space as well as open up existing CE areas that are currently close to the airfield for future flight operations related missions. The purpose and need for expansion of the CE facility 1060 is to provide more

administrative space and allow the move of CE personnel from facilities proposed for demolition that are in the airfield Clear Zone (CZ) and Accident Potential Zone (APZ) to this more central location. The purpose and need for demolition of small munitions storage facilities (1322, 1327 and 1330) is to make room for future flight operations missions and the Fire Crash Rescue Station, and offer more effective use of space near the airfield. The purpose for construction of a Department of State (DoS) warehouse is to provide for storage of various aircraft parts and materials near existing hangars used for DoS aircraft maintenance and parking based on the need for additional, conveniently located square footage.

The purpose and need for development of the PAFB Hangars Beach (also known as Central Beach) is to enhance QOL for active and retired military, DoD civilians, contractors and their families as well as the public. The purpose and need for new crossovers, lookout pavilions, showers, and restrooms is to provide enhanced beach access and amenities for those visiting Hangars Beach for improved QOL.

ADP VI: South Base Community Support (including Golf Course and Marina)

The purpose and need for development of the south base area is to improve the core community area through traffic congestion relief, force protection/anti-terrorism upgrades, and service, retail and recreational amenity additions and enrichments. A few facilities in ADP VI are proposed to be demolished, constructed, or renovated to meet the purpose and need. The new Veterinary Clinic's purpose and need is to provide more modern, on-base medical treatment for military working dogs and for active and retired military families' pets in a more logical location near the military dog kennels and base community medical area, and replace the outdated and aged facility 408 found within the less compatible ADP II, North Base Administrative. The purpose and need for expansion of facility 1360 for a tire center is to provide a convenient location for active and retired military to purchase tires and vehicle related items identified as a need through Army Air Force Exchange Service (AAFES). The purpose and need for a food preparation, catering, and storage facility is to accommodate the growing contracted food service business as PAFB looks for ways to reduce costs by centralizing and supplying the food service on base and reducing transportation requirements.

Improvements and enhancements to QOL for active and retired military, DoD civilians and contractors and their families serve as the purpose and need for renovation, expansion or upgrades to the PAFB Golf Course and Clubhouse, PAFB Marina and Clubhouse, and PAFB South/ Pineda Beach area. The purpose for renovations and expansion to the Golf Course Clubhouse and Marina Clubhouse is to provide a higher level of amenities for a greater number of personnel; studies that have indicated greater profit (to contribute to morale, welfare, and recreation funds) if improvements are made. Expansion of the Golf Course Clubhouse will also fulfill the purpose of transforming into a Collocated Club based on the need as the existing Tides Club repair costs begin to surpass new construction costs due to its age and corrosive location next to the beach. In relation to repair by replacement of PAFB Marina wet slips and re-configuration of slips to retain larger vessels (not increasing slips), the purpose and need has been identified through NAF to correct safety issues caused by deteriorating wood, narrow pedestrian walkways (finger piers), and insufficient water and electric outlets as well to increase profit identified through studies showing a need for larger slips. The purpose and need for parking lot expansion at Pineda Beach (also known as South Beach) is to correct safety issues that result as the parking lot fills up and vehicles begin to park along the very busy SRA1A which increases accident risk (especially since this beach access is at a major intersection with

the Pineda Causeway); lot expansion will also allow for an increase of beach access points. The purpose for new crossovers, lookout pavilions, bus stop, showers, and restrooms is to provide enhanced beach access and amenities for those visiting Pineda Beach for improved QOL.

The purpose and need for construction of new high explosive munitions bunkers is to replace bunkers that are over 70 years old (includes demolition of 1425, 1432, 1435, 1437, 1440) with updated, modern bunkers that are safer and will allow for greater munitions storage without requiring larger bunkers due to new material technologies and construction design, and will result in less transportation of munitions from bunkers at CCAFS. Finally, the purpose for PAFB South Gate security upgrades is to meet AT/FP requirements, provide increased safety measures for PAFB Security Forces, and reduce traffic problems along South Patrick Drive based on the need indicated through frequent traffic backups and security inspections that have identified improvements that should occur.

Airfield

Though the airfield is not covered within an ADP, it is a significant portion of PAFB and will be discussed in this EA. The purpose and need for maintaining the airfield area through removal of old pavement/concrete and infrastructure that are obstructions, upgrading lighting and electrical systems, as well as runway, taxiway and shoulder pavement renovations is to provide for safe flying operations to prevent mishaps, aircraft damage and personnel injury/death while sustaining DoD flying missions.

South Housing

The former South Housing area is also not covered in an ADP because significant mission functions were not identified during the General Plan process. Remaining PAFB parcels in this area serve as community support such as the Community/Shark Center, Youth Center, South Chapel, ball fields and soccer fields. The need for construction of restrooms for the soccer fields is to provide toilets for patrons of the fields who otherwise will have to travel to surrounding local businesses, and the purpose is to improve recreational and fitness amenities for enhanced QOL for active and retired military, Department of Defense (DoD) civilians, contractors and their families. The purpose and need for demolition of the former South Housing fire station is to remove an unnecessary building that is in poor condition which will assist PAFB in meeting DoD infrastructure and cost reduction goals requiring a 20% reduction by 2020.

1.5 Scope of the Environmental Assessment

This EA evaluates the potential site-specific environmental consequences associated with the implementation of the PAFB General Plan (Proposed Action), the No Action Alternative, and alternatives to the proposed action. This EA was produced using available information to the maximum extent possible. All applicable environmental data necessary was collected to describe current environmental conditions. The following environmental aspects were identified for analysis: Air Quality, Biological Resources, Cultural Resources, Geology and Soils, Hazardous Materials and Waste, Safety and Health (including Noise), Infrastructure and Transportation, Air Installation Compatible Use Zone (AICUZ) and Land Use, Water Resources and Socioeconomics.

This EA also identifies past EAs completed for PAFB which can be utilized to determine potential impacts of future planned actions at PAFB. However, the master planning process and related operations that occur at PAFB are subject to continual change in response to a wide range of influencing factors. Therefore, this document must include programmatic elements designed to support the evaluation of environmental impacts relating to future actions and plans. The General Plan EA is not an all-inclusive document with respect to projecting potential future environmental impacts and only addresses reasonable foreseeable activities. During the design review process it will be determined if further NEPA documentation, evaluation or consultations are required. Supplemental analysis will be required if there are substantial changes to proposed actions that are relevant to environmental concerns or significant new circumstances or information relevant to environmental concerns and bearing on the proposed actions arise.

PAFB, being on a barrier island, results in several actions occurring in the 100-year floodplain; this document will enable programmatic assessment and finding of no practicable alternatives (FONPA) discussions for construction in the 100-year floodplain for the projects discussed within this EA. This EA will only specifically address projects anticipated to occur within the next five (5) years.

Potential programmatic evaluation elements are intended to accomplish the following:

- 1) Enhance the installation's ability to incorporate environmental considerations into the formulation of operating and planning decisions at the early concept stage, thereby minimizing potential impacts and improving the efficiency of the planning and environmental review process.
- 2) Reduce the need for preparation of repetitive individual environmental documents for low impact or routine actions that are similar to those evaluated in this document.
- 3) Reduce the need to prepare individual FONPA documents for actions occurring in the 100-year floodplain that are covered in the current PAFB General Plan.
- 4) Reduce the effort required to evaluate larger new actions by using this PAFB General Plan EA as a baseline reference.

The list of identified EAs and related documents for PAFB in Section 1.5 are representative of the types of actions that occur on PAFB, and are likely to be identified and evaluated in the future. The PAFB General Plan EA is not an all-inclusive document with respect to projecting potential future environmental impacts, and only addresses known planned projects and reasonable foreseeable activities. Conclusions of this EA are based on the best available knowledge and projected scope of activities identified through base planning and programming. New actions similar to other actions which have been determined to have an insignificant impact in a similar setting as established in this EA may potentially be categorically excluded from further analysis by documenting application of the categorical exclusion on an Air Force (AF) Form 813. Actions requiring mitigation due to impacts to wetlands will require a separate EA as they are not covered in this PAFB GP EA. If significant scope modifications occur during final design that will require additional environmental impact analysis, this document, and potentially other EAs, may be used for reference. This programmatic PAFB GP EA, along with other documents, will be reviewed periodically to monitor cumulative effects. The 45 SW Asset Management/ Planning Function (CES/CEAO) ensures integration of the Environmental Impact Analysis Process (EIAP) from initial planning as scopes are provided through design until

completion of the projects with any required environmental inspections. Regardless, compliance with all applicable laws and regulations is required for any actions on PAFB.

1.6 Related Environmental Documentation

USAF, 2010. *Amended Environmental Assessment for the Construction of the United States Air Force Technical Applications Center at Patrick AFB, FL.* U.S. Air Force, AFTAC. November 2010.

USAF, 2009. *45th Space Wing Integrated Natural Resources Management Plan; Patrick Air Force Base, Cape Canaveral Air Force Station, Malabar Transmitter Annex, and Jonathan Dickinson Missile Tracking Annex, U.S. Air Force, 45th Space Wing, FL.*

USAF, 2008. *Environmental Assessment for the Implementation of the Integrated Natural Resources Management Plan, 45th Space Wing (properties), FL.* U.S. Air Force, 45th Space Wing. September 2008.

USAF, 2008. *Environmental Assessment for the Military Family Housing Privatization Initiative, Patrick Air Force Base, FL.* U.S. Air Force, Air Force Center for Engineering and the Environment (AFCEE) and the 45th Space Wing. November 2008.

USAF, 2006. *Programmatic Environmental Assessment for Construction, Maintenance and Demolition of Communications, Wind, Water, and Camera Towers, 45th Space Wing (properties), FL.* U.S. Air Force, 45th Space Wing. February 2006.

USAF, 2005. *Environmental Assessment for the Beddown of the 920th Rescue Wing at Patrick AFB, FL.* U.S. Air Force, 920th Rescue Wing. December 2005.

USAF, 2005. *Environmental Assessment for the General Plan and Maintenance of Patrick AFB, FL.* U.S. Air Force, 45th Space Wing. May 2005.

USAF, 2005. *Programmatic Environmental Assessment for Land Clearing Activities, 45th Space Wing (properties), FL.* U.S. Air Force, 45th Space Wing. May 2005.

These documents may be accessed by request through Ms. Keitha Dattilo-Bain, 45th Space Wing Civil Engineering Squadron, Email:keitha.dattilobain@us.af.mil.

2.0 Description of Proposed Action and Alternatives

This Section describes the Proposed Action and Other Alternatives considered or eliminated from further consideration, and the No Action Alternative. Refer to Table 2-1 for a list of proposed projects per ADP, and to Table 2-2 for detailed descriptions of proposed actions, no action alternatives, selection standards, and alternatives for each project.

2.1 Proposed Action

The Proposed Action is the implementation of the PAFB General Plan (GP) and two projects in the South Housing area to provide continued development and maintenance of PAFB. The GP assists decision-makers in accommodating growth, mission changes, and facility needs at the installation. Refer to Table 2-1 in Section 2.1.1 below for larger projects proposed at PAFB in the next five years, and to Appendix A for a list of proposed basic maintenance projects for sustainment, restoration, and modernization over the next five years.

Operations expand, functions reorganize, or mission demands increase thus requiring more or different types of space. Several facilities are located within the airfield Clear Zone (CZ) and Accident Potential Zone (APZ); these buildings are in a group recommended for demolition to keep facilities out of this area to reduce aircraft mishap risk, although full demolition in this area is not anticipated to occur for at least another 10 years because most facilities are in good condition, and administrative space is in high demand. Facilities proposed for demolition in the next five years in the CZ area are found in Table 2-1 with alternative discussions in Table 2-2. Anti-Terrorism/Force Protection (AT/FP) requirements have prompted several projects to strengthen security such as controlled perimeters for secure areas, upgraded infrastructure to support CCTV, alarms, radar, and thermal imaging when necessary for security requirements, increase standoff distances from parking and buildings, and installation of barriers to keep vehicles from getting closer to buildings. Facility and site designs must also ensure that there are adequate standoff distances as well as functionality for barrier plans during various Threat Conditions; these added space requirements have a significant effect on surrounding transportation routes and site footprint size.

Six individual ADPs were developed through the GP, each of which addresses a specific geographic area at PAFB. In addition to ADPs, there are proposed actions for the airfield as well as PAFB parcels in former South Housing. Figure 1-2, within preceding pages, is the Area Development Plan Key that presents the location of each ADP. All figures (drawings) included in this EA conceptually illustrate the idealist 20-year development plan from the PAFB General Plan, however, these 20-year concepts were developed with limited integration of planning and environmental constraints. This PAFB GP EA incorporated the 20-year conceptual sketches so proposed facility construction could be visualized (no drawings were developed for earlier than 20 years), however, only development proposed within the next five years is analyzed within this document. Each ADP figure (2-1 to 2-8) has highlighted, boxed areas that show the location of proposed actions planned within the next five years.

2.1.1 Area Development Plans

An ADP is a conceptual site diagram depicting present and future development within a specific geographic or operational area of PAFB. Each ADP is developed in consideration of the specific needs and goals of each ADP area and overall PAFB development objectives. Regular maintenance and sustainment, such as painting, corrosion control, paving, HVAC upgrades,

roof repairs, fire suppression/protection installations and repairs, tower repairs, grounds/landscaping maintenance, window repairs, and dredging/cleaning of drainage canals, ditches and grates, are required for mission support and improved efficiencies. These types of activities can generally be categorically excluded from additional impact analyses under NEPA. Projects that can not be categorically excluded are being analyzed within this EA per six ADP areas in addition to the airfield and South Housing. The PAFB airfield has not been identified as a specific ADP because no long-term changes to the airfield have been identified. However, several projects associated with airfield infrastructure demolition and renovations within the next five years have been identified, and these projects are discussed as appropriate. Additionally the parcels and facilities still owned by the Air Force within the former South Housing area (Figure 1-3 in preceding pages) were not included in the General Plan, however, projects are still proposed that will be covered in this EA. Projects proposed within the next five years are found in Table 2-1 on the next page.

Table 2-1: Capital Improvement Program List of Projected Projects

ADP	Project
I	Picnic Tables Beach Access Expansion & Upgrades
I	Beach Equipment Rental and Food, Beverage & Retail Sales
I	Install Drainage Pipe along SRA1A for Facilities 251, 253, 255
I	Improvements to the Riverside Recreational and Fitness Trail
II	Main Gate Relocation - Privately Owned Vehicles (POV)- [Separate EA]
II	Demolition of Facilities 407, 408, & 410 (water tower and pump)
II	Beachhouse Beach Access Expansion & Upgrades
II	Main Gate Beach Access Upgrades
II	Dormitory Rehabilitation (502, 503, 505 506) with Potential Addition
II	Defense Equal Opportunity Management Institute (DEOMI) Expansion & Stormwater Management Re-configuration
III	Consolidated Network Communications Control Center and Demo Facility 533
III	Demolition of Facilities 515, 522, 523, 524, 557, 559, 560, and 739
III	920th Campus--Phase 1--Admin Complex & Airfield Adjacent Facilities- [Separate EA]
III	920th Campus- Stormwater Management Re-configuration
III	920th Campus--Hangar 750 Ramp/Apron Renovation & Drainage [Separate EA]
IV	FAMCAMP RV Park Expansion & Recreation Facilities/Trail Complex
V	New Truck Inspection Gate- [Separate EA]
V	Demolition of Facilities 948 & 951 (water tower & pump)
V	Hangars Beach Access Upgrades
V	Construct Fire Crash Rescue Station and Training Facility & Demo Facility 810
V	Vehicle Maintenance Complex & Demolish Facilities 960, 938, 912 and 1968
V	Demolish 980 & Construct Civil Engineering (CE) Shops Complex--Phase 1
V	Demolition of Small Munitions (Inert) Storage (1322, 1327, 1330)
V	Facility 1060 CE Expansion
V	Department of State Warehouse
VIa	Veterinary Clinic
VIa	Food Preparation, Catering & Storage Facility (Food Transformation)
VIa	Tire Center--Expansion of Bldg 1360
VIa	Pineda Beach Access Expansion & Upgrades
VIa	South Gate Modifications- Security Upgrades
VIb	Marina Modifications (eliminate 16 slips & renovate docks D, E, F and finger piers; upgraded electrical and water supply)
VIb	Demo Munitions Bunkers (1425, 1432, 1435, 1437, 1440) & Construct New
VIb	Expand/Upgrade Marina Clubhouse
VIb	Expand/Upgrade Golf Course Clubhouse (Future Collocated Club)
AIR*	Airfield Lighting & Electrical
AIR	Airfield Runways, Taxiways and Shoulder Pavement Renovation
AIR	Remove Airfield Pavement and Real Property Obstructions
SOUTH**	Construct Restroom at Soccer Field
SOUTH	Demolish Former South Housing Fire Station

*AIR=Airfield; **SOUTH=South PAFB Discontiguous Parcels in former South Housing

Table 2-2: Overview of Proposed Action, No Action, Selection Standards, and Alternatives Per Project

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
I	Picnic Tables Beach Access Expansion & Upgrades	Expand and upgrade with new parking lot, crossovers (3), lookout pavilions (3), bathrooms (2), showers (2). See scope Section 2.1.1.1.	Maintain current beach access configuration with no new facilities or parking lot expansion	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Limit new construction to expanded parking lot to south, new ingress point from SRA 1A, crossover (1) & lookout pavilion (1). Meets standards 1-4 & 6; reasonable and carried forward for analysis.
I	Beach Equipment Rental, Retail & Food Facility	Construct new beach retail facility. See scope Section 2.1.1.1.	Maintain current beach access configuration with no new facilities or parking lot expansion	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Construct beach retail at Pineda Beach. Eliminated because it did not meet standards 2-6.
I	Install Drain Pipe along SRA 1A for Facilities 251, 253 & 255	Construct new drainage pipe. See scope Section 2.1.1.1.	Status quo using workarounds to deal with flooding after storm events	1)Base mission compatibility, 2)safety, and 3)environmental concerns	<i>No alternatives proposed.</i> Nothing else meets purpose and need of correcting safety deficiency.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
II	Demolition of Facilities 407, 408, & 410 (water tower and pump) [Supplemental EA necessary due to pending cultural resolution for all except Fac 407.]	Demo listed facilities. [This EA will only cover Facility 407 due to pending cultural resolution of the others proposed for demo.] See scope Section 2.1.1.2.	Maintain facilities to prevent safety and occupational health issues, but re-use limited with no intensive renovation work	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, and 5) cultural concerns	<i>Alternative 1:</i> Complete renovation of Facility 408. Eliminated because it did not meet standards 1-4. This facility is not needed; the new vet clinic is proposed in ADP VI.
II	Main Gate Relocation - Privately Owned Vehicles (POV)- [Separate EA]	Main Gate relocation and re-configuration	Separate pending EA	Separate pending EA	Separate pending EA

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
II	Beachhouse Beach Access Expansion & Upgrades	Expand and upgrade with new parking lot, crossovers (3), community pavilion (1), lookout pavilions (3), bathrooms (2), showers (2), traffic lights. See scope Section 2.1.1.2.	Maintain current beach access configuration with no new facilities or parking lot expansion	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<p><i>Alternative 1:</i> Limit new construction to Beachhouse elevated pavilions (2), driveway, expanded parking lot to south, new ingress point from SRA 1A, traffic light, crossover (1) & lookout pavilion (1). Meets standards 1-4 & 6; reasonable and carried forward for analysis.</p> <p><i>Alternative 2:</i> Demolish Beachhouse and maintain parking lot & beach access as is. Eliminated because it did not meet standards 1-2 & 5-6.</p>

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
II	Main Gate Beach Access Upgrades	Expand and upgrade with new crossovers (2), lookout platforms (2), bathrooms (1), showers (1). See scope Section 2.1.1.2.	Maintain current beach access configuration with no new facilities	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Limit new construction to crossover (1) and lookout platforms (2). Meets standards 1-4 & 6; reasonable and carried forward for analysis.
II	Dormitory Rehabilitation (502, 503, 505, 506)	Renovate dorms and construct additions. See scope Section 2.1.1.2.	Maintain dorms to prevent safety and occupational health issues, but limited work with no intensive renovation work	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of Enlisted Airmen, and 6)cost to value	<i>Alternative 1:</i> Extensively renovate dorms, but do not build additions. Meets standards 1-4 & 6; reasonable and carried forward for analysis. <i>Alternative 2:</i> Demolish dorms and build new dormitory complex. Reasonable as meets standards 1-5, but eliminated due to standard 6 as cost would be exorbitant. (see 2.3)

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
II	Defense Equal Opportunity Management Institute (DEOMI) Expansion and Stormwater Management Re-configuration	Construct addition to DEOMI and re-configure stormwater treatment system. See Section 2.1.1.2.	Maintain DEOMI in current configuration	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, and 5)cost to value	<p><i>Alternative 1:</i> Reduce square footage of addition. Meets standards 1-4; reasonable and carried forward for analysis.</p> <p><i>Alternative 2:</i> Build separate building near DEOMI. Eliminated because it did not meet standards 1-2 & 5.</p> <p><i>Alternative 3:</i> Expand existing wet detention near the river instead of relocating treatment away from the river to consolidate systems and open up the riverside for future development. Eliminated because it did not meet standards 2-5.</p>

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
III	Demolish Facilities 515, 522, 523, & 524, Construct Consolidated Network Communications Control (CNCC) Center and then Demo Facility 533.	Demo listed facilities. Construct consolidated network communications control and maintenance center. See Section 2.1.1.3.	Maintain existing configuration of network communications within Facility 533	1)Base mission compatibility, 2)GP/land use compatibility, 3)communications compatibility, 4) security, 5)environmental concerns, and 6)cost to value	<i>Alternative 1:</i> Expand Facility 533. Eliminated because it did not meet standards 1-6. CNCC needs to be near existing primary comm lines. <i>Alternative 2:</i> Demolish 533 and build CNCC on site. Eliminated because it did not meet standards 1-6. PAFB can't be without a comm control center.
III	Demolition of Facilities 557, 559, 560, and 739 [Supplemental EA necessary due to pending cultural resolution for all except Fac 739.]	Demo listed facilities. [This EA will only cover Facility 739 demo due to pending cultural resolution of the others proposed for demo.] See Section 2.1.1.3.	Maintain facilities to prevent safety and occupational health issues, but re-use limited with no intensive renovation work	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, and 5) cultural concerns	<i>No alternatives proposed.</i> Nothing else meets purpose and need of removing unneeded facilities in the airfield CZ and per 20% reduction by 2020.
III	920th RQW Campus-Admin Complex & Airfield Adjacent Facilities- [Separate EA]	Build, renovate, expand facilities per the 920th RQW Beddown	Separate EA	Separate EA	Separate EA

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
III	920 RQW Campus- Stormwater Management Re-configuration	Re-configure stormwater management systems within 920 RQW campus. See Section 2.1.1.3.	Maintain existing stormwater swales/treatment	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, and 5) tenant satisfaction	<i>Alternative 1:</i> Re-configure with wet detention instead of dry to reduce amount of space needed for stormwater systems. Eliminated because it did not meet standards 1-5.
III	920th RQW Campus- Hangar 750 Ramp/Apron Renovation & Drainage [Supplemental EA necessary due to pending cultural resolution.]	Renovate extensive concrete and pavement of the 750 Ramp and improve drainage [This EA will not cover these actions due to pending cultural resolution.]	Separate pending EA	Separate pending EA	Separate pending EA

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
IV	FAMCAMP RV Park Expansion & Recreation Facilities/Trail Complex	Construct new RV sites with full hookups, increase utility capacities, construct community center, pavilions (5), campsite trails, recreation center, light use recreational trails, low impact parking, kiosks, and stormwater management. See Section 2.1.1.4.	Maintain FAMCAMP area in current configuration with utility repair by replacement	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<p><i>Alternative 1:</i> Limit expansion of FAMCAMP and reuse Facility 1657 as a community center once the outdoor firing range is demolished, and the site is cleaned and restored. Meets all standards but 5; reasonable and carried forward for analysis.</p> <p><i>Alternative 2:</i> Limit expansion of day-use light recreational trail complex on closed landfill adjacent to FAMCAMP. Meets all standards but 5; reasonable and carried forward for analysis.</p>
V	New Truck Inspection Gate- [Separate EA]	Expand truck inspection gate and construct new facilities	Separate pending EA	Separate pending EA	Separate pending EA
V	Demolition of Facilities 948 & 951 (water tower & pump) [Supplemental EA necessary due to pending cultural resolution]	Demo listed facilities. [Supplemental EA necessary due to pending cultural resolution]	Separate pending EA	Separate pending EA	Separate pending EA

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
V	Hangars Beach Access Upgrades	Expand and upgrade with new crossovers (2), lookout pavilions (2), bathrooms (1), showers (1). See Section 2.1.1.5.	Maintain current beach access configuration with no new facilities	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Limit new construction to crossover (1) and lookout pavilion (1). Meets standards 1-4 & 6; reasonable and carried forward for analysis.
V	Construct Fire Crash Rescue Station and Training Facility & Demolish Facility 810 [Supplemental EA necessary due to pending cultural resolution for demo of 810.]	Construct new fire crash rescue station and training center. Demo fac 810. [Supplemental EA necessary due to pending cultural resolution for demo of 810.]	Maintain existing configuration of fire station (in fac 810)	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, 6)cultural concerns, and 7)cost to value	<i>Alternative 1:</i> Expand and upgrade Facility 810. Eliminated because it did not meet standards 2-7. Fac 810 is severely outdated and sustains flood damage after every major storm due to location. <i>Alternative 2:</i> Build FCR Station next to existing (fac 810) and elevate site. Eliminated because it did not meet standards 1-7.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
V	Demolish Facilities 912, 938, 960, and 1968 and Construct Vehicle Maintenance Complex and repurpose Facility 313 to administrative and some industrial processes	Demo listed facilities. Construct vehicle maintenance and operations complex and repurpose fac 313. See Section 2.1.1.5.	Maintain existing configuration of main vehicle maintenance center (in fac 313)	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, 6) cultural concerns, and 7)cost to value	<p><i>Alternative 1:</i> Extensive renovations for Facility 313 to facilitate modern vehicle maintenance. Meets standards 1-5; reasonable and carried forward for analysis.</p> <p><i>Alternative 2:</i> Demolish 313 after new vehicle maintenance complex constructed. Eliminated because it did not meet standard 6 (significant adverse effect).</p> <p><i>Alternative 3:</i> Consolidate vehicle maintenance at CCAFS. Eliminated because it did not meet standards 1-3 & 7. A PAFB location is needed to meet AF vehicle accountability.</p>

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
V	Construct Civil Engineering (CE) Shops Complex-Phase I & Demolish Facility 980	Demo fac 980. Construct phase I CE shops complex (2 new facilities). See Section 2.1.1.5.	Maintain existing configuration of six different CE shops	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, 6)cultural concerns, and 7)cost to value	<p><i>Alternative 1:</i> Consolidate CE shops behind fac 1360 and current CE Electric shop (fac 1350). Meets standards 3-7; reasonable and carried forward for analysis.</p> <p><i>Alternative 2:</i> Consolidate CE shops in former contractor laydown yard (riverside industrial). Eliminated because did not meet standards 1-5 & 7.</p>

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
V	Demolition of Small Munitions (Inert) Storage (1322, 1327, 1330)	Demo listed facilities. See Section 2.1.1.5.	Maintain facilities to prevent safety and occupational health issues, but re-use limited with no intensive renovation work.	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, 6)cultural concerns, and 7)cost to value	<i>Alternative 1:</i> Only demolish Facility 1322 to make room for future fire station. Meets standards 1 & 3-7; reasonable and carried forward for analysis.
V	Facility 1060 CE Expansion	Construct addition for fac 1060 for administrative use. See Section 2.1.1.5.	Maintain existing configuration of fac 1060.	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, and 6)cost to value	<i>No alternatives proposed.</i> Nothing else meets purpose and need of providing CE admin space and demo of facilities in the CZ (currently used by CE).
V	Department of State Warehouse	Construct warehouse for Department of State. See Section 2.1.1.5.	Continue to store aircraft parts and materials in three different facilities in two different areas on PAFB.	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, and 6)cultural concerns	<i>Alternative 1:</i> Construct addition on to Hangar 985 or 986. Eliminated because did not meet standards 3-6. Emphasis on critical safety issues with exposure to elements & cultural concerns with mod to historic resource.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
Vla	Veterinary Clinic	Construct vet clinic. See Section 2.1.1.6.	Maintain facility 408 to prevent safety and occupational health issues, but with no intensive renovation work.	1) Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)cultural concerns, and 6)cost to value	<i>Alternative 1:</i> Complete renovation of Facility 408. Eliminated because it did not meet standards 1-4 & 6. Fac 408 is incompatibly located in an admin area & cost to renovate to obtain facility with current vet medicine technology is greater than new construction.
Vla	Food Preparation, Catering & Storage Facility (Food Transformation-privatization)	Construct food prep and storage facility	Maintain current off-base food prep and storage and transportation of food onto PAFB from various locations	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, and 5)cost to value	<i>Alternative 1:</i> Site the facility near the Dining Hall in ADP II (Admin). Meets standards 1 & 3-6; reasonable and carried forward for analysis.
Vla	Tire Center--Expansion of Facility 1360	Construct addition to facility 1360 for a tire center.	Do not construct addition; tire services remain off base	1)Base mission compatibility, 2)GP/land use compatibility, 3)active and retired military satisfaction, and 4)cost to value	<i>Alternative 1:</i> Develop Tire Center in BX. Meets standards 1-4; reasonable and carried forward for analysis.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
VIa	Pineda Beach Access Expansion & Upgrades	Expand and upgrade with new parking lot, crossovers (3), lookout pavilions (3), bathrooms (1), showers (2). See scope Section 2.1.1.6.	Maintain current beach access configuration with no parking lot expansion or new facilities	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Limit new construction to small parking lot expansion, crossover (1) and lookout pavilions (2). Meets standards 1-4 & 6; reasonable and carried forward for analysis.
VIa	South Gate Modifications- Security Upgrades	Upgrade security measures through final denial barriers, etc. See Section 2.1.1.6.	Maintain current South Gate configuration	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, and 5)environmental concerns	<i>No alternatives proposed.</i> Nothing else meets purpose and need of correcting AT/FP and safety deficiencies.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
VIb	Marina Modifications	Eliminate 16 slips & renovate docks D, E, F and finger piers; upgrade electrical and water supply. Section 2.1.1.6.	Repair marina as needed to maintain safety	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Add larger slips to marina configuration thus increasing vessel capacity in wet storage. Eliminated because it did not meet standard 4; significant impacts anticipated due to regulatory constraints related to manatee protection and boat number increase within marinas.
VIb	Demo Munitions Bunkers (1425, 1432, 1435, 1437, 1440) & Construct New	Demo listed facilities and construct new bunkers	Maintain facilities to prevent safety and occupational health issues, but with no intensive renovation work.	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)security, 5)environmental concerns, 6)cultural concerns, and 7)cost to value	<i>Alternative 1:</i> Move all munitions to CCAFS. Eliminated because it did not meet standards 1, 3-4, & 7. This is not compatible with the base or tenant missions in which munitions are necessary for deployment and rescue operations out of PAFB.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
VIb	Expand and Upgrade Golf Course Clubhouse (Future Collocated Club)	Expand and upgrade golf course clubhouse	Maintain facility in its current configuration	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<p><i>Alternative 1:</i> Alternate site for collocated club was North Housing (ADP I). Eliminated when housing became privatized and fell under a 50-year lease.</p> <p><i>Alternative 2:</i> Alternate site for collocated club was former Officers Club on the beach (ADP II). Eliminated due to inability to have appropriate AT/FP setbacks & significant cost and risk with construction in the 100-yr floodplain.</p> <p><i>Alternative 3:</i> Alternate site for collocated club was the Dining Hall (ADP II). Eliminated when the dining hall became privatized and under contract.</p>

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
VIb	Expand and Upgrade Marina Clubhouse	Expand and upgrade marina clubhouse	Maintain facility in its current configuration	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1:</i> Close marina clubhouse and emphasize golf course clubhouse. Eliminated because it did not meet standards 2 & 5-6. This alternative would reduce QOL options and would remove amenities expected by marina patrons.
AIR*	Airfield Lighting & Electrical Upgrades	Upgrade lighting and electrical systems for the airfield	Repair as needed, but no upgrades or significant changes to existing systems	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, and 5)cost to value	<i>Alternative 1:</i> Close the airfield. Eliminated because it did not meet standard 1 & 5 and would require significant cost to the Federal Gov't (taxpayers) with relocation of several tenants with flying missions and would require re-routing of several Defense units that use PAFB for flight training operations.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
AIR	Airfield Runways, Taxiways and Shoulder Pavement Renovation	Renovate concrete and pavement for the airfield	Repair as needed, but no upgrades or significant changes to existing pavement	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, and 4)cost to value	<i>Alternative 1:</i> Close the airfield. Eliminated (see above discussion in previous alternative for airfield).
AIR	Remove Airfield Pavement and Real Property Obstructions [Supplemental EA necessary due to pending cultural resolution for demo.]	Permanently remove former airfield concrete and pavement no longer needed, and demolish obstructions in the CZ and APZ. [Supplemental EA necessary due to pending cultural resolution for demo.]	Leave old pavement and obstructions	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4) cultural concerns, and 5)cost to value	<i>Alternative 1:</i> Close the airfield. Eliminated (see above discussion in previous alternative for airfield).
SOUTH**	Construct Restrooms near Soccer Fields	Construct restrooms near soccer fields	Do not construct restrooms	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, 5)satisfaction of AF QOL, and 6)cost to value	<i>Alternative 1: Use portable restrooms.</i> Eliminated because it did not meet standards 2-6. This alternative would not be compatible with AF standards to eliminate temporary structures, and would provide unsatisfactory QOL amenities.

ADP Area	Project	Proposed Action	No Action	Selection Standards	Alternatives
SOUTH	Demolish Former South Housing Fire Station (fac 3650) [Supplemental EA necessary due to pending cultural resolution for demo.]	Demolish former fire station. [Supplemental EA necessary due to pending cultural resolution for demo.]	Leave former Fire Station as abandoned in place	1)Base mission compatibility, 2)GP/land use compatibility, 3)safety, 4)environmental concerns, and 5)cost to value	<i>Alternative 1:</i> Renovate former fire station. Eliminated because it did not meet standards 1-5. The facility is no longer needed, there is no functional use for it, and the cost to renovate is greater than new construction.

*AIR=Airfield, **SOUTH=South PAFB Discontiguous Parcels in former South Housing

2.1.1.1 Area Development Plan I: North Base Residential (NBR)

The NBR area is utilized by active and retired military, Department of Defense civilians and contractors, and the public. The NBR ADP, located at the north end of PAFB, is bounded on the east by State Road A1A (SRA1A) and the Atlantic Ocean coastal beachfront, on the west by the Banana River, and on the south by the North Base Administration area. NBR activities currently include the privately operated North Housing, Outdoor Recreation beach houses (3), riverside fitness trail, and the publicly accessible Picnic Tables Beach east of SRA1A. Actions in the NBR ADP occur in the 100-year floodplain. Figure 2-1 on the following page is the conceptual illustration of ADP I with highlighted boxes indicating location of actions (the highlighted line is the riverside trail) identified below.

The Proposed Actions for ADP I NBR are outlined below in the list of specific projects planned within the next five years:

- Construct new facilities in the beachfront Picnic Tables Beach area, to include parking lot expansion to the south, a bus stop, another picnic pavilion with ADA access, restrooms to the south, sand volleyball court, and elevated roofed lookout decks (3). All new facilities will be west of the dune except where some dune vegetation will need to be removed for lookouts and for new crossovers and beach access ramps, and parking lot expansion, but vegetation disturbance will be limited to only what is absolutely necessary for human safety. Proposed lookout pavilions will be approximately 350 ft, 950 ft, and 1150 ft to the south from the existing bathroom generally at the backside of the dune vegetation with minimal vegetation removal. No structures will eliminate protected species nesting habitat.
- Construct a services rental/concession facility to make beach-related equipment and food, drinks, and snacks conveniently available for entitled personnel. This facility will be west of the dune and in an improved area.
- Add dune crossovers (3) and boardwalks (2) for Picnic Tables Beach to enhance beach access and support proposed facility improvements with minimal disturbance to the existing dune and vegetation. Proposed crossovers and boardwalks will be approximately 100 ft, 900 ft, and 1200 ft to the south from the existing bathroom with minimal dune vegetation removal (approximately 5-8 ft wide). No structures will eliminate protected species nesting habitat.
- Make landscaping improvements along SR A1A in front of parking lots to screen picnic areas from the highway and improve site environment without causing visual barriers to safe ingress/egress. This will occur in an improved area.
- Construct new ingress/egress along the south end of the Picnic Table Beach parking lot to improve traffic flow and connection with SR A1A. This will occur in an improved area approximately 750 ft south of existing ingress/egress.
- Construct new drainage pipe along SRA1A for Facilities 251, 253 and 255 (outdoor recreation beach rental homes). This will occur in an improved area along SRA1A west of the beach rental homes.
- Maintenance of the riverside trail and restoration of riverside habitat (invasive removal). This will occur in an improved to semi-improved area.

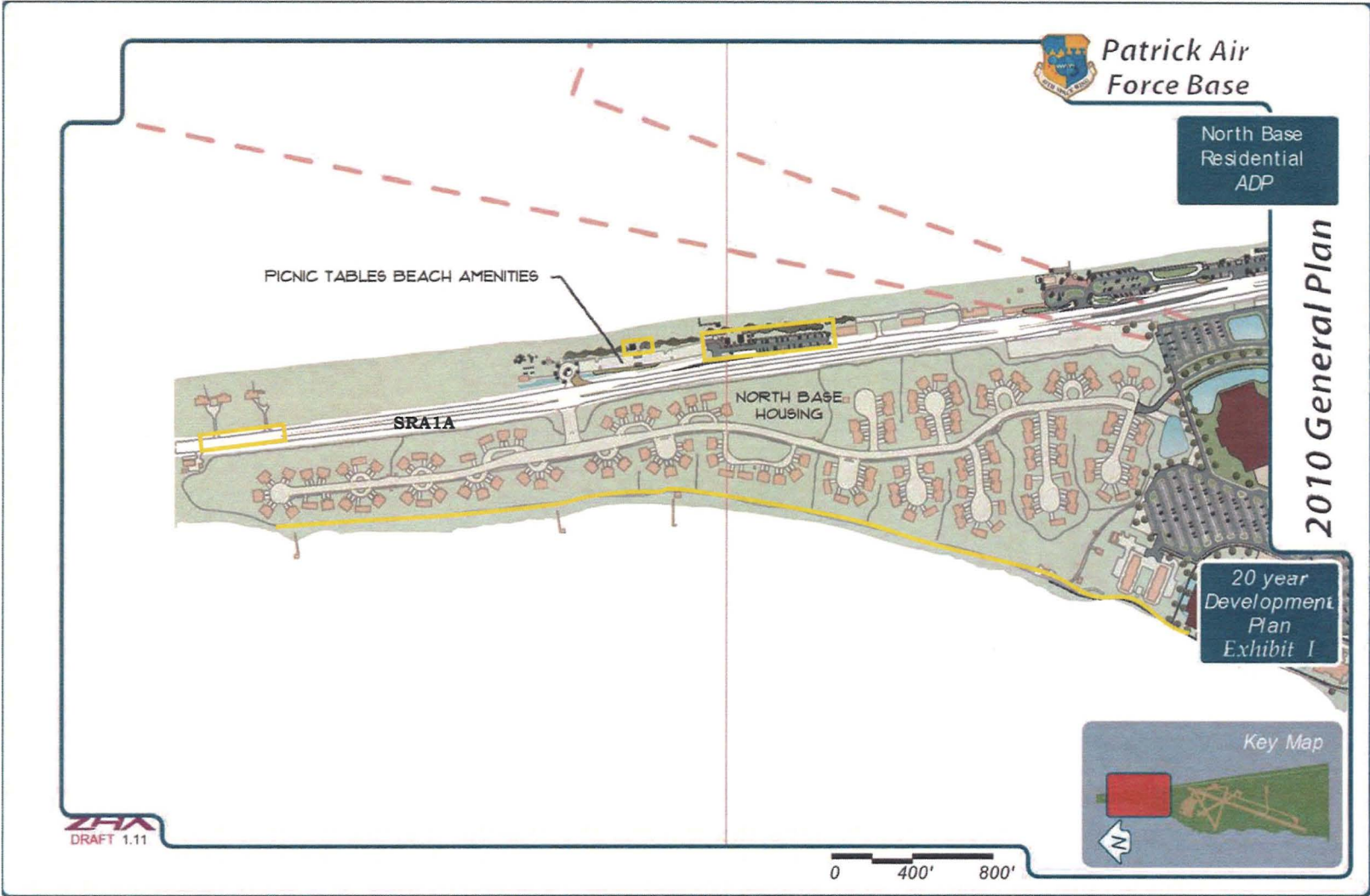


FIGURE 2-1: AREA DEVELOPMENT PLAN I: NORTH BASE RESIDENTIAL

2.1.1.2 Area Development Plan II: North Base Administration (NBA)

The NBA ADP is characterized by a campus plan with pedestrian-friendly circulation, perimeter parking and vehicle circulation, and existing multi-story buildings to maximize green space and river viewsheds. Active, visiting and retired military as well as authorized Department of Defense civilians and contractors work within and utilize this area. The NBA area is bounded on the north by the NBR Housing Complex, on the east by SRA1A and the Atlantic Ocean beachfront, on the west by the Banana River, and on the south by the Mid-Base River Industrial (MBRI) area and the Airfield. The NBA area is the PAFB administrative center, and functions currently include 45 SW Headquarters and operational administrative offices, training facilities, dormitory housing, recreational facilities, chapel, and other storage and support functions. The Main Gate entrance to PAFB is also currently located in the NBA, at the intersection of SRA1A and Jupiter Street. Projects proposed east of State Road A1A are in the 100-year floodplain. Figure 2-2, following the Proposed Actions for ADP II, is the conceptual schematic of NBA within 20-years with highlighted boxes indicating location of actions identified below (the highlighted line is the riverside trail). Only projects planned for the next five years will be discussed in this document, and are listed below for ADP II. An asterisk next to a facility signifies that the action will be covered in a supplemental EA because of cultural resource concerns and unfinished Section 110 NHPA consultation and response from SHPO (currently considered significant adverse effect or approved mitigation to insignificance is required).

The Proposed Actions for ADP II NBA are outlined below in the list of specific projects:

- Relocate the Main Gate and re-design circulation to meet force protection/anti-terrorism requirements (being analyzed in a separate EA).
- Intermediate security enhancements at the existing Main Gate such as fencing/cable barriers, weather covers for ID check lanes, over watch tower, final denial barriers, spike strips, etc., if MILCON funding slips fiscal years for the full gate relocation. This is within an improved area.
- Relocate industrial functions away from the NBA to consolidated locations in the Mid-Base East Support area, and replace these functions with functions moved out of the Clear Zone & Accident Potential Zone or consolidated from other NBA sites. This is in improved areas.
- Demolition of Facilities 407, 408*, and 410* (water tower and pump). This is in an improved area.
- Construct addition to and/or renovate dormitories (502, 503, 505, & 506). An addition is projected to the north of the existing dorms. This is in an improved area.
- Construct expansion to DEOMI. An addition to the building is projected to the north of the facility and parking lot expansion to the east. This is in an improved area.
- Re-design stormwater systems near DEOMI to provide for enhanced pre-treatment and consolidate systems to allow for riverside development. Stormwater wet detention re-location is proposed from current location northwest of DEOMI to northeast. This is in an improved area.
- Renovate historic resource, former seaplane ramp, Facility 302* (historic resource in the 100-year floodplain).
- Create landscaped parking areas on the campus perimeter convenient to structures allowing facility access without crossing roadways. This is in improved areas.
- Renovate the Beachhouse club. Interior work includes updated bar, wall finishes, lighting, ceiling finishes, ceiling fans, etc. Exterior includes construction of new facilities

for the Beachhouse area, to include a bus stop, new elevated pavilions (2) behind the Beachhouse club with restrooms and showers associated with one of the pavilions, elevated roofed lookout decks (3), a large pavilion to the south with restrooms, new central showers, parking lot expansion to the north, a connected walkway from the parking lot to the new Beachhouse south entrance, improved stormwater management (including removal of storm drains on the beach), and traffic signal modifications. All new facilities will be west of the dune/seawall except for new crossovers and beach access ramps that will be constructed with minimal vegetation disturbance. All new facilities associated with the Beachhouse club are within 100 ft to 500 ft from the facility. The southern pavilion and restrooms, parking lot expansion, one lookout deck, and storm drain removal are within a range of 250 ft to 1250 ft from the Beachhouse club. This action is in the 100-year floodplain. No structures will eliminate protected species nesting habitat.

- Add dune crossovers/boardwalks (3) to enhance beach access from the Beachhouse area and support proposed facility improvements with minimal disturbance to the existing dune and vegetation. Proposed crossovers and boardwalks will be approximately 100 ft, 400 ft, and 600 ft to the southeast from the existing Beachhouse club with minimal dune vegetation removal (approximately 5-8 ft wide). This action is in the 100-year floodplain. No structures will eliminate protected species nesting habitat.
- Make landscaping improvements along SRA1A within all parking lots to screen pavilion/parking areas from the highway and improve site environment. This action is in the 100-year floodplain and an improved area.
- Construct new ingress/egress along the north end of the parking lot for the Beachhouse area to improve traffic flow and better connect with SRA1A (approximately 300 ft south of the Beachhouse club). Move the traffic signal to this more northern location (700 ft north of existing location) and make modifications to the south access for single direction of movement. This action is in the 100-year floodplain and an improved area.
- Construct new facilities for the Main Gate Beach area, to include a bus stop, new lookout platforms (2), lookout pavilion (1), surfboard racks (2), and dune crossovers. All new facilities will be west of the dune except for new crossovers and beach access ramps that will be constructed with minimal vegetation disturbance. Locations are within 50 to 200 ft south of the northernmost crossover. Construction must be cognizant of constraints as it is located in the Clear Zone. This action is in the 100-year floodplain. No structures will eliminate protected species nesting habitat.
- Make landscaping improvements along SRA1A within all parking lots to screen parking areas from the highway and improve site environment without causing visual barriers to safe ingress/egress or Clear Zone violations. This action is in the 100-year floodplain and an improved area.

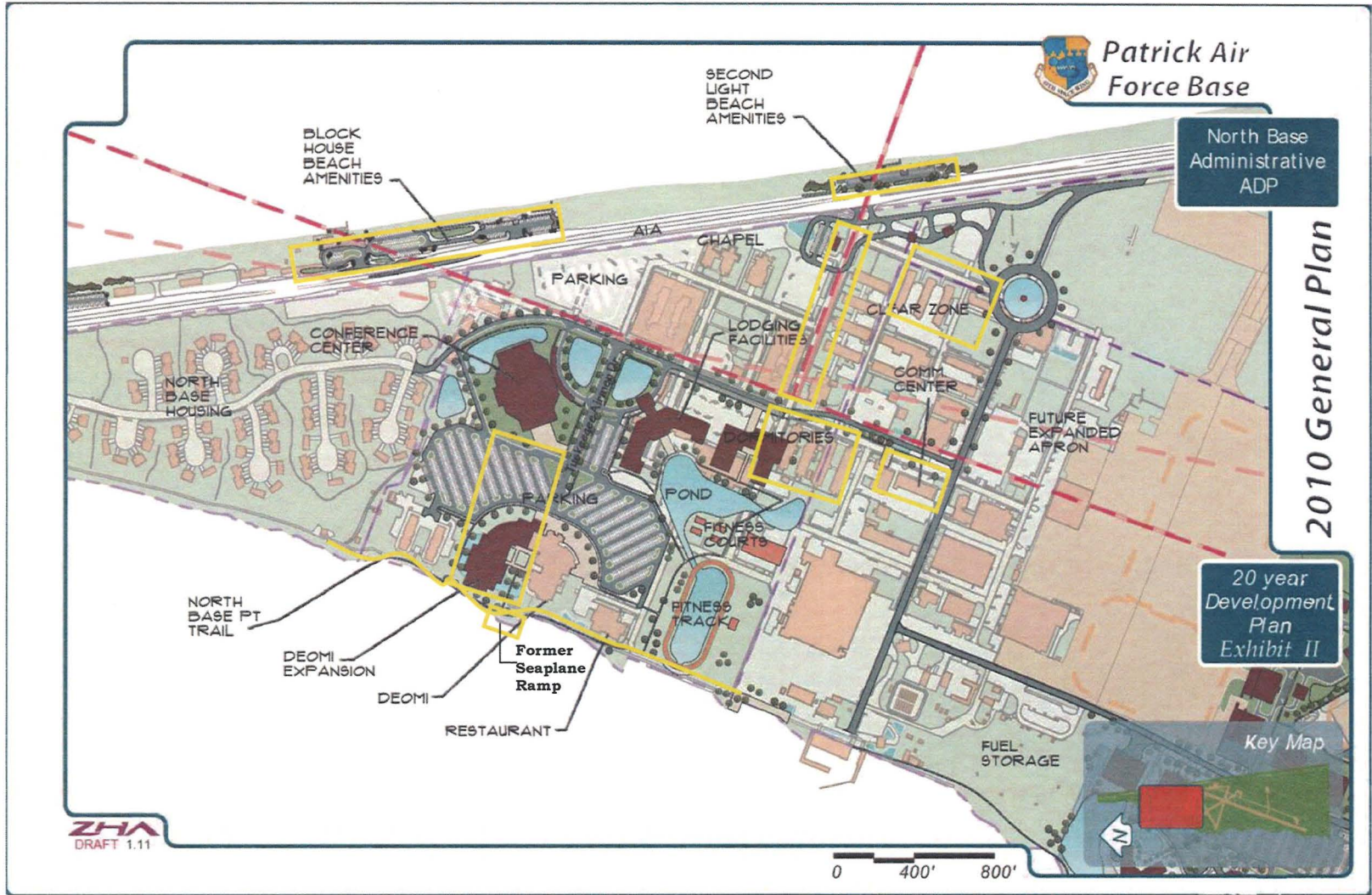


FIGURE 2-2: AREA DEVELOPMENT PLAN II: NORTH BASE ADMINISTRATION

2.1.1.3 Area Development Plan III: Mid-Base River Industrial (MBRI)

The MBRI development area is characterized by buildings and facilities optimizing airfield access and supporting the 920th Rescue Wing. The MBRI area is bounded on the north by the NBA, on the east by airfield, on the south by Mid-Base Military Recreational (MBMR), and on the west by the Banana River. MBRI includes the Rescue Road corridor and a portion of Taxiway "J" and related functions. Facilities include the Fuel Farm, 920th Rescue Wing (920 RQW) operations and maintenance facilities, Squadron Operations and Aircraft Maintenance, newly constructed Combat Weapons Firing Range (indoor), and various Civil Engineering (CE) functions. CE facilities would be relocated and consolidated to the Engineering Complex planned in the Mid-Base East Support development area. The Liquid Oxygen (LOX) facilities and vehicle parking would be renovated as needed in their present locations.

Under the General Plan, non-aviation oriented mission compatible operations would be relocated away from the apron and out of the MBRI area, when possible. The MBRI ADP area has generally been considered the 920 RQW campus, an area mainly concentrated with this major tenant of PAFB. In addition to consolidation actions discussed above, proposed actions for ADP III in the next five years include construction and renovation in support of the 920 RQW. These actions have been analyzed in the *Environmental Assessment (EA) for the 920 RQW Beddown at PAFB, FL*, that resulted in a finding of no significant impact, dated 18 December 2005.

An asterisk next to a facility signifies that the action will be covered in a supplemental EA because of cultural resource concerns and unfinished Section 110 NHPA consultation and response from SHPO (currently considered significant adverse effect or approved mitigation to insignificance is required). Other proposed actions, not covered in the 920 RQW EA, to be noted in this EA for ADP III, are:

- Demolition of Facilities 515, 522, 523, & 524 and construction of Consolidated Network Communications Control Center (CNCC) with follow-on demolition of Facility 533. Refer to Figure 2-2 above for a better representation of location on PAFB. The CNCC is identified as "COMM CENTER" in Figure 2-2. This is in an improved area.
- Demolition of Facilities 557*, 559*, 560*, and 739 to remove from the Clear Zone and reach 20% cost reduction by 2020. This is in an improved area.
- 920 RQW Hangar 750 ramp renovation and drainage corrections*.
- Stormwater management re-configuration for the 920 RQW Campus riverside development west of the facilities (in the 100-year floodplain). This is in an improved to semi-improved area.
- Enhancements (benches, water fountains, emergency phones) along the multi-use riverside trail adjacent to the Banana River (in the 100-year floodplain). This is in an improved to semi-improved area.
- Renovation of former seaplane ramps 303* and 305* (historic resources in the 100-year floodplain).
- Repair/renovation to Hangar 313* for repurposing to administrative and industrial (when Vehicle Maintenance Complex is constructed in ADP V). This is in an improved area.

Figure 2-3, following Section 2.1.1.4 below, is the conceptual schematic of ADP III within 20-years with highlighted boxes indicating location of actions identified in the next five years. The highlighted line is the riverside recreational trail.

2.1.1.4 Area Development Plan IV: Mid-Base Military Recreational (MBMR)

The MBMR development area contains facilities supporting physical fitness training and recreational activities for active and retired military. The MBMR area is bounded on the north by the MBRI ADP area, and east and south by the airfield development area, and on the west by the Banana River. Amenities currently include Chevron Park and the Family Camping (FAMCAMP) grounds. It is projected that the MBMR will continue to be utilized for FAMCAMP and related recreational activities through the 20-year development plan. Figure 2-4, below Figure 2-3, is the conceptual schematic of ADP IV within 20-years with highlighted boxes indicating location of actions proposed with five years, bulleted below. The highlighted line is the riverside recreational trail. Most actions along the Banana River and most of the FAMCAMP area are within the 100-year floodplain. There are also several issues with existing closed dump/landfill sites in this area managed by the 45 SW Installation Restoration Program (IRP) that will restrict the amount of development that can occur.

The Proposed Actions for ADP IV MBMR are below in the list of specific projects proposed within five years:

- Convert overflow camping sites to full-hook up sites with electric, water, sewer and required roads, RV pads, and stormwater management. This is in an improved area.
- Develop a day-use light fitness/recreational trail over the closed landfill south of FAMCAMP with picnic areas, exercise stations, safety fencing, waterless toilets, and educational natural/cultural resource kiosks. This is in a semi-improved area.
- Expand FAMCAMP and increase camp sites once the firing range is demolished. This is in an improved area.
- Construct community pavilions (2), a community center, and another restroom/shower facility. This is in an improved area.



FIGURE 2-3: AREA DEVELOPMENT PLAN III: MID-BASE RIVER INDUSTRIAL

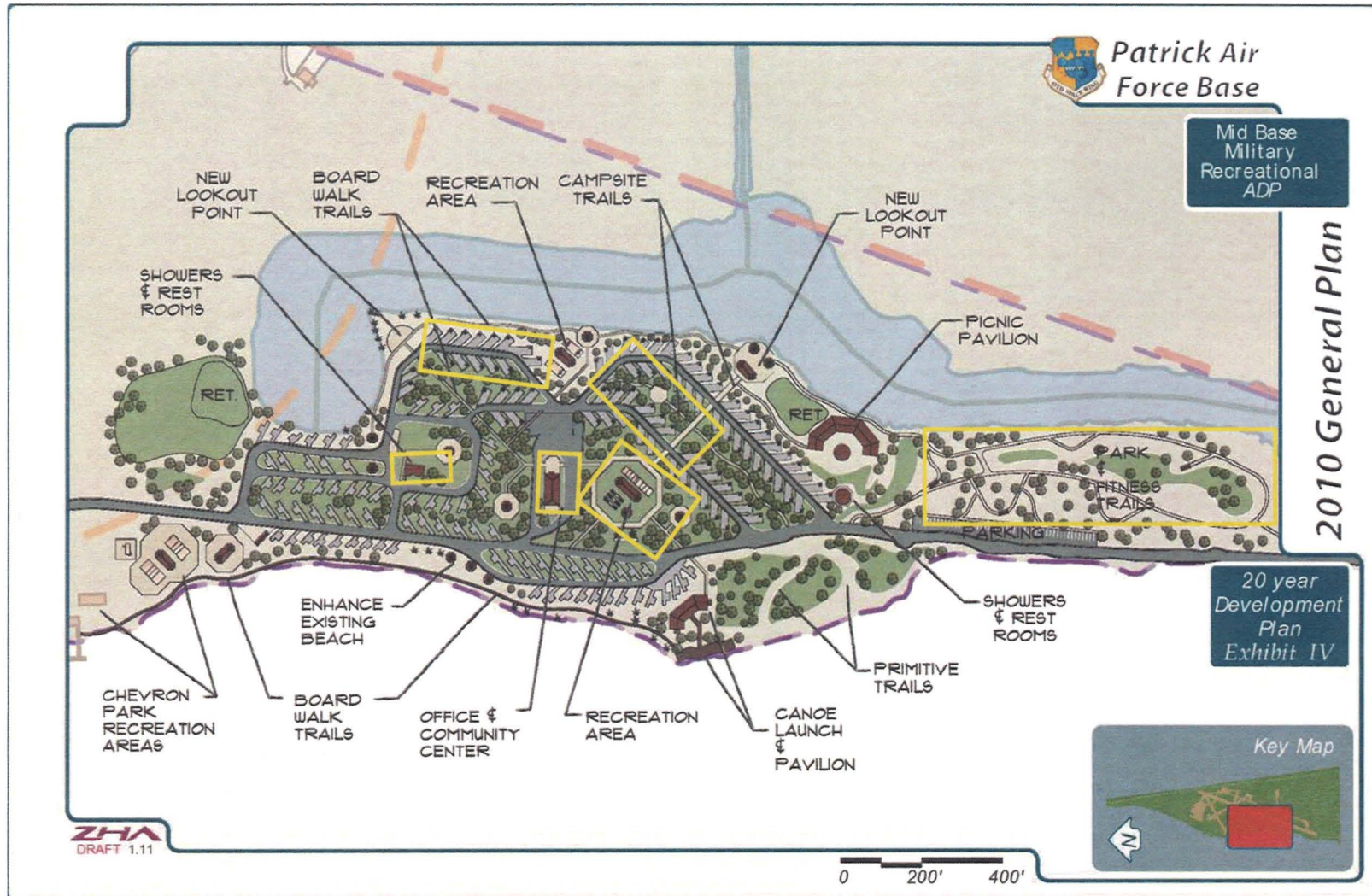


FIGURE 2-4: AREA DEVELOPMENT PLAN IV: MID-BASE MILITARY RECREATIONAL

2.1.1.5 Area Development Plan V: Mid Base East Support (MBES)

The MBES development area is characterized by buildings and facilities that are maintenance and/or operationally associated or have specific missions such as the Air Force Technical Applications Center (AFTAC) and Department of State air operations. The MBES development area is bounded on the east by SRA1A and the Atlantic Ocean, on the north and west by the airfield, and on the south by the South Base Community Support development area. Facility function in the MBES area include the Air Passenger Terminal, Civil Engineering storage, Security Forces, vehicle maintenance, the commercial truck/vehicle inspection, and munitions storage. Figure 2-5 on the following page is the conceptual schematic of ADP V within 20-years with highlighted boxes indicating locations of proposed actions identified below. Listed below are the projects planned for the next five years for ADP V. Proposed actions that were previously analyzed are identified below and will not be addressed in this EA except through cumulative impact analyses. An asterisk next to a facility signifies that the action will be covered in a supplemental EA because of cultural resource concerns and unfinished Section 110 NHPA consultation until a response from SHPO is received indicating either no significant adverse effect or approved mitigation to insignificance.

Specific projects identified for the MBES ADP include:

- Renovate and expand Commercial Vehicle (Truck) Inspection Facility/Gate on land vacated by the demolition of housing units (to be analyzed in the separate Main Gate EA) to correct traffic congestion and safety problems.
- Construct new Fire Crash Rescue and Training Facility (originally analyzed in the 2004 General Plan EA) and demolish facility 810*. This is in an improved area.
- Construction of the AFTAC complex began in February 2012 and is anticipated to finish in 2015. The *Amended Environmental Assessment for Construction of the United States Air Force Technical Applications Center (AFTAC) at PAFB, FL*, analyzed impacts of this action and resulted in a finding of no significant impact, dated 4 November 2010.
- Demolition of Small Munitions (Inert) Storage facilities (1422, 1427, & 1430) for the proposed Fire Crash Rescue Training facility and possible new aviation-related missions. This is in an improved area.
- Demolition of Facility 980 and relocation and consolidation of Civil Engineering (CE) offices, shops and storage facilities from the NBA, MBRI, and other base locations to a new complex of facilities (2 for Phase I). This is in an improved area.
- Expand Facility 1060 for CE administrative use and functionality. This is in an improved area.
- Demolish Facilities 960, 938, 912 and 1968 (picnic pavilion) and Construct the proposed new Vehicle Maintenance Complex. This is in an improved area.
- Construct a Department of State (DOS) warehouse south of existing Hangars 985 and 986. This is in an improved area.
- Upgrade Hangars Beach area to include a roofed lookout deck (1) approximately central to the existing boardwalk and a dune crossover within this central boardwalk. All new facilities will be west of the dune except a new proposed crossover that will be constructed with minimal vegetation disturbance (6-8 ft wide). Hangars Beach area is located in the 100-year floodplain. Hangars Beach isn't shown on Figure 2-5, but an arrow indicates it is north of the proposed Vehicle Maintenance Facility (approximately 2800 ft northeast). No structures will eliminate protected species nesting habitat.

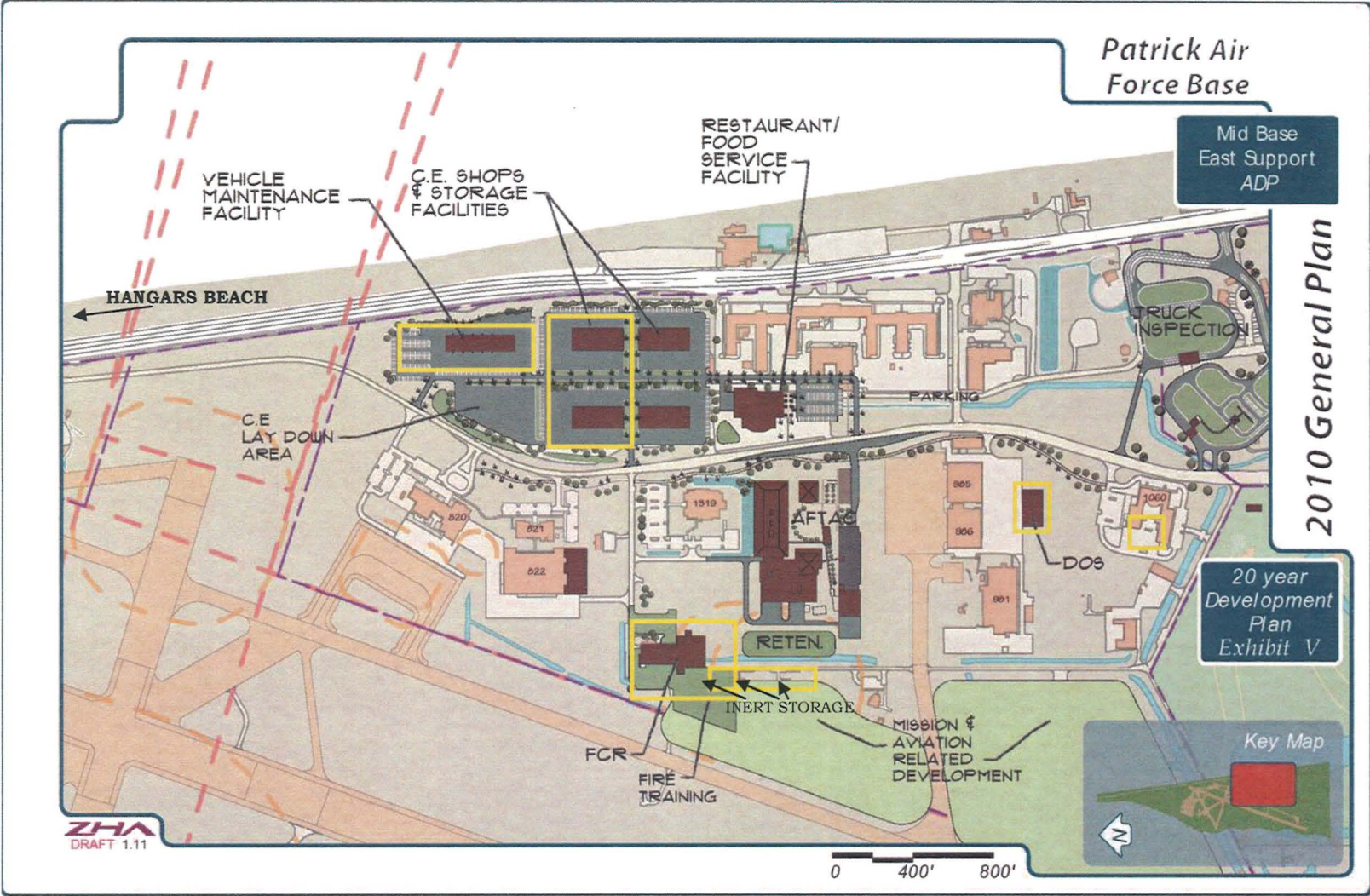


FIGURE 2-5: AREA DEVELOPMENT PLAN V: MID-BASE EAST SUPPORT

2.1.1.6 Area Development Plan VI South Base Community Support (SBCS)

The SBCS ADP seeks to support the health and well-being of active and retired military personnel through retail, health care, recreation and fitness, entertainment, and leased housing facilities. The SBCS development area is bounded by the MBES and airfield on the north, the Atlantic Ocean and SRA1A on the east, State Route (SR) 404 (Pineda Causeway) on the south and the airfield and the Banana River on the west. The development area includes centers for both services and recreation, separated by South Patrick Drive, with services generally to the north and east, and recreation generally to the south and west. Functions within the services area include: the Child Development Center; Base Exchange with food court, and Commissary; medical, dental and veterinary clinics, and pharmacy; Air Rescue Medical Training facilities; Florida Air National Guard (FLANG) facilities; Security Forces kennel and operations facilities; fueling station with car wash, and fast food restaurant. Functions within the recreation area include the PAFB Golf Course with clubhouse and support facilities; the PAFB Marina with related Club and support facilities, parking and storage facilities; recreational vehicle parking/storage; and base operations and maintenance facilities and storage warehouses.

2.1.1.6.1 ADP VIa: SBCS East

The SBCS East development area is utilized by active and retired military, DoD civilians and contractors, and the South/Pineda Beach area is publicly accessible. The SBCS East area is bounded by the Atlantic Ocean to the east, the Mid-Base East Support (MBES) area to the north, and the South Base Community Support (SBCS) area to the west, and SR 404 to the south. The central housing complex is currently privately operated under a 50-year lease contract that began in 2008. Vehicular congestion and site access have been identified as the largest challenges facing the SBCS area. Figure 2-6 (on the following page) is the conceptual schematic of ADP VIa within 20-years with highlighted boxes indicating locations of proposed projects within the next five years, identified below. An asterisk next to a facility signifies that the action will be covered in a supplemental EA because of cultural resource concerns and unfinished Section 110 NHPA consultation until a response from SHPO is received indicating either no significant adverse effect or approved mitigation to insignificance.

Specific projects identified for SBCS East include:

- South Gate modifications and upgrades for anti-terrorism/force protection requirements (final denial barriers/fencing, bollards, spike strips, new gate, over watch, lane security check stations, sunshades, lightning protection). This is in an improved area.
- Construct privatized food preparation, catering and storage facility (Force Support). This is in an improved area.
- Renovate and expand Pineda Beach area with parking lot additions to the north and south with associated re-configurations of ingress/egress to the north. Construct new facilities to include a bus stop, new elevated lookout towers (2) with showers, a new restroom, new crossovers (2), improved stormwater management (including removal of a storm drain on the beach. All new facilities will be west of the dune except for new crossovers that will be constructed with minimal vegetation disturbance. Pineda Beach is in the 100-year floodplain. New facilities will be approximately 80 ft to 900 ft north of the existing bathroom generally at the backside of the dune. No structures will eliminate protected species nesting habitat.
- Expansion of Facility 1360 for a tire center. This is in an improved area.

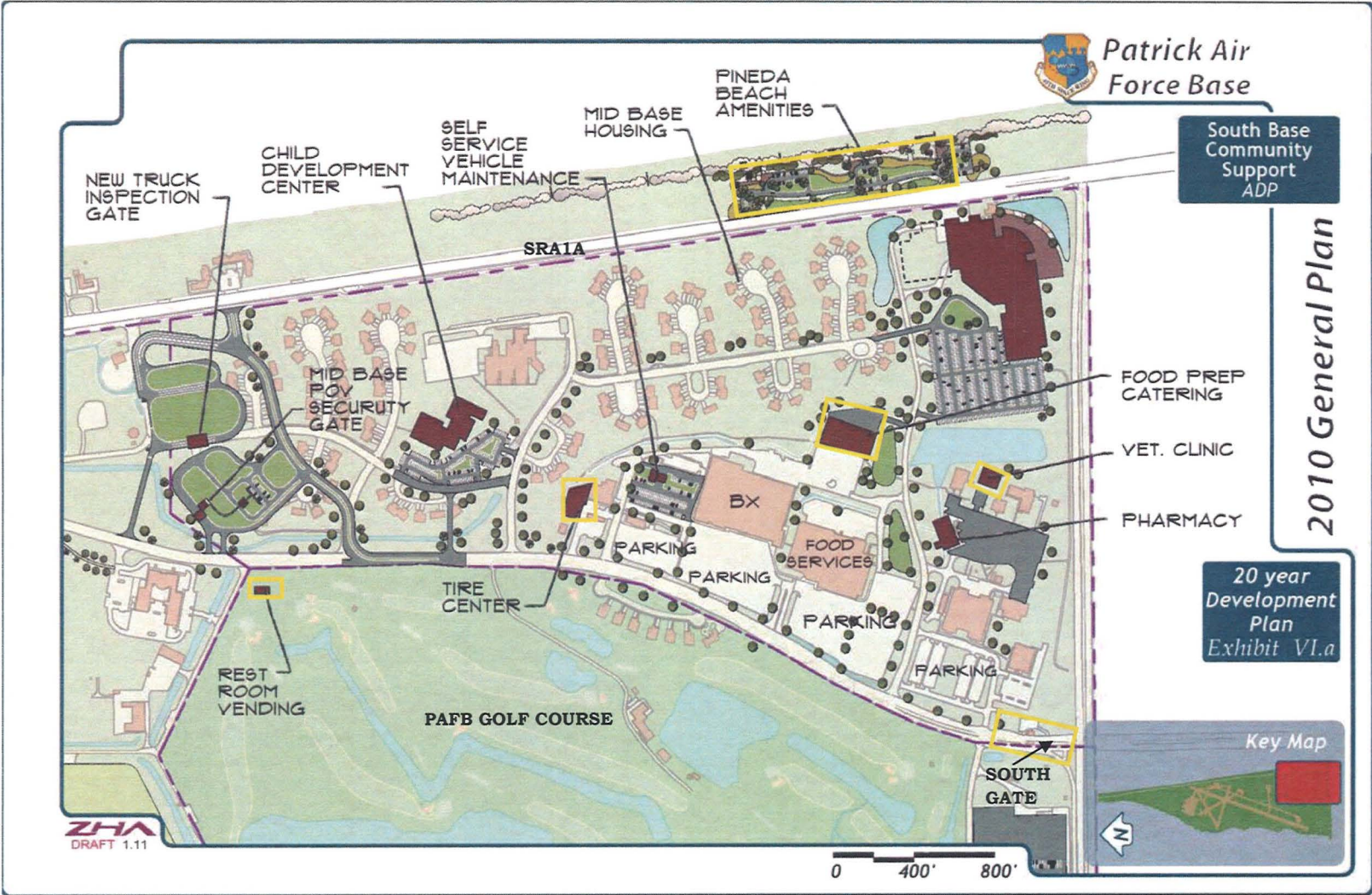


FIGURE 2-6: AREA DEVELOPMENT PLAN VI: SOUTH BASE COMMUNITY SUPPORT EAST

2.1.1.6.2 ADP VIb: SBCS West

The SBCS West development area is utilized by active and retired military, DoD civilians and contractors, and the public if they obtain a badge through a security check. The SBCS West area is bounded by the SBCS to the east, the MBES area to the north, the airfield to the west, and SR 404 to the south. This recreational area includes the PAFB Golf Course and Clubhouse and support facilities; the PAFB Marina and Club, parking and storage facilities; recreational vehicle parking/storage. Also included are some base maintenance and storage warehouses.

Figure 2-7 on the following page is the conceptual schematic of ADP VIb within 20-years with highlighted boxes indicating locations of projects proposed for the next five years. All projects in ADP VIb are in the 100-year floodplain.

Specific projects identified for SBCS West include:

- Marina dock repair by replacement of the existing wet slips and mooring pilings for D, E and F Docks. Additionally, approximately 16 slips will be removed to allow slip length increases to accommodate larger boats. Work will also include upgrades to electrical and water supplies (to the wet slips), and finger pier width increase for safety improvements (Force Support). This is within U.S. jurisdictional waters and will require permitting.
- Improvements and upgrades to the Marina area to include expansion of the Club and re-configuration of parking lots. This is in an improved area.
- Maintenance and upkeep of Golf Course canals included in a regional stormwater permitted system (dredging, etc.). This is within improved to semi-improved area; the canals fall under a stormwater permit and as such are not U.S. jurisdictional waters.
- Expansion and upgrades to the Golf Course Clubhouse to accommodate a Collocated Club, and improve parking lots. This is within an improved area.
- Construct Tiki bars (2) along the Golf Course canals near the Clubhouse to provide outdoor eating/drinking accommodations.
- Construct restroom and vending station at the northeast end of the Golf Course. See Figure 2-6 for a delineated proposed site location on the golf course (improved).
- Demolition of High Explosive Munitions Bunkers (1425, 1432, 1437 & 1440) and construction of new bunkers to bring bunkers to current standards and provide safer more modern munitions storage. This is in an improved to semi-improved area.

2.1.1.6.3 Airfield

The proposed action of maintaining the airfield area is required to provide for safe flying operations to prevent mishaps, aircraft damage and personnel injury/death while sustaining Air Force flying missions. Actions planned for the airfield (improved to semi-improved) include upgrades to the electrical and lighting systems, pavement restoration for runways, taxiways and shoulders, and demolition of abandoned pavement and abandoned infrastructure (over 183,000 sq ft).

2.1.1.6.4 South Housing

The proposed actions in the next five years for PAFB parcels in South Housing (improved) are to construct restrooms near the soccer fields and demolish the former Fire Station (Facility 3650). Please refer to Figure 1-3 for locations.

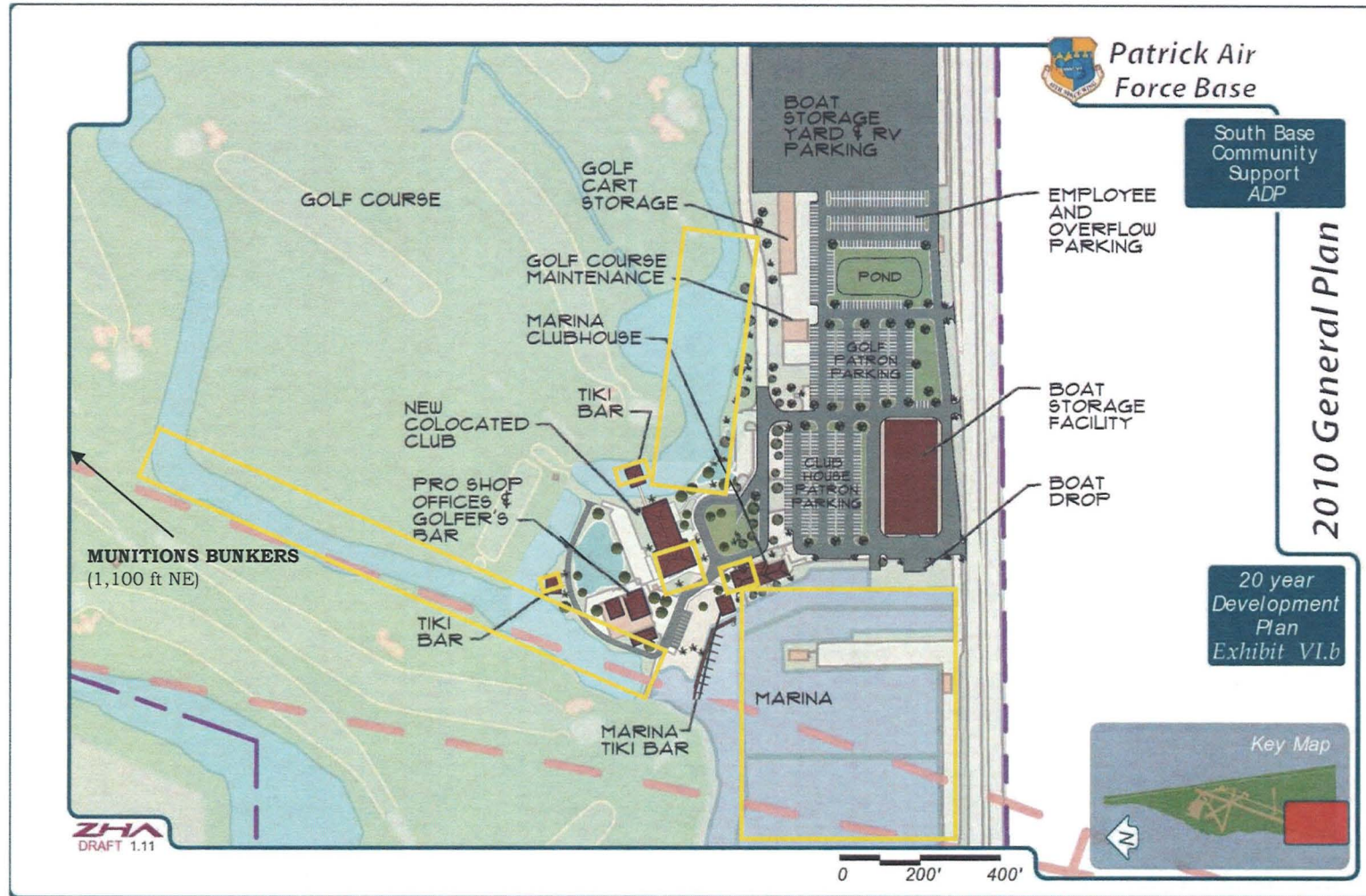


FIGURE 2-7: AREA DEVELOPMENT PLAN VI: SOUTH BASE COMMUNITY SUPPORT WEST

2.2 No Action Alternative

The No-Action Alternative for General Plan implementation would be to maintain existing facilities, infrastructure and grounds at PAFB and not consolidate, demolish or construct new facilities in support of changing operational requirements as envisioned in the PAFB General Plan. This alternative would provide for operational support of PAFB, but not at the efficiencies projected to be available from the Proposed Action. The mission need for operational support could be minimally met under this alternative, but current and future missions, safety and quality of life would be impaired. Not all of the selection standards nor the purpose and need for the proposed actions would be met under the No Action Alternative. Refer to Table 2-2 for a listing of all no action alternatives per each project identified in the next five years within each ADP, the PAFB airfield and PAFB parcels in former South Housing.

2.3 Other Alternatives

Refer to Table 2-2 for a listing of all alternatives proposed per project identified within five years within each ADP, the PAFB airfield, and PAFB parcels in former South Housing. Discussions below provide some more detail on the reasons why some proposed alternatives were eliminated from further analyses.

ADP I: North Base Housing

The alternative to construct a beach equipment rental and snack bar facility at Pineda Beach was eliminated because it did not meet the standard for cost to value as this facility is more appropriate for the north beach which is utilized by a much greater number of people because the beach is a lot larger and wider. Additionally, this alternative site was eliminated because of greater safety and environmental concerns. The site is very close to a major intersection with Pineda Causeway; the GP attempted to allow some expansion here without over-building creating more patronage that could result in higher accident risk. Environmental concerns stem from adding too much additional lighting in this south area of PAFB beach where a greater percentage (75%) of sea turtle nesting occurs compared to the north beach where the smallest nesting percentage occurs (25%).

ADP II: North Base Administrative

The alternative to completely renovate facility 408 instead of demolishing it was eliminated because it is not compatible with the base mission or GP/land use. This facility is outdated, is not sufficient to meet veterinary service needs, and is within an administrative district instead of the medical support area. This facility is also becoming a safety issue due to its deteriorating materials (over 50 years old) and is more of an environmental concern due to heavy metal based paint use over the years and higher pesticide usage to control termites. A new veterinary clinic is proposed in the medical support area in ADP VI, and this facility can then be demolished.

The alternative to demolish the Beachhouse club was eliminated because it did not meet the selection standards of mission and land use compatibility and Quality of Life (QOL) support as this club has become another morale, welfare, and recreation (MWR) asset for base personnel.

Demolition of the Beachhouse club was also eliminated because the cost to demolish the club far outweighs the value to keep it and receive profit to be returned to the MWR account.

The alternative to demolish the dorms and build a new dormitory complex would provide mission compatibility and improve safety, however, the cost to demolish 4 dorm facilities and build a dorm complex would far outweigh the cost to simply renovate and add an addition to the dorms as the existing dorms are still viable despite their 50+ year age because of previous renovation work. The cost estimate for demolition and new construction is roughly \$8M while renovation and addition work is roughly \$1M. There would be no increased value to building a new dorm complex in the next five years, however, this alternative will be reasonable within a 10-20 year timeframe.

The alternative proposed to build a separate building near DEOMI instead of expanding DEOMI was eliminated because it would not be compatible with the base mission or land use as it would remove a significant area that could be utilized for another function. Likewise, it would reduce efficiencies and workflow by causing personnel in training to take more time to walk in between buildings instead of in between classrooms. The cost to build a new building would outweigh any value received from more square footage for training space compared to adding onto the existing DEOMI.

The alternative to expand existing riverside wet retention ponds for DEOMI was eliminated because it would remove more desirable riverside locations for other administrative facilities, would create more safety risk by increasing the potential for bird aircraft strikes with attraction to expanded surface waters, and would significantly reduce opportunities for consolidating adjacent stormwater systems away from the river which will improve stormwater treatment. This riverside area of PAFB is not considered to be in the 100-year floodplain because of the existing seawall (1940s) that blocks floodwater surge. Improvements to the stormwater system would not be able to be realized, thereby increasing some environmental concerns about proper pre-treatment prior to discharging with stormwater overflow situations.

ADP III: Mid Base River Industrial

The alternative of expanding the existing Facility 533 instead of constructing the Consolidated Network Communications Control Center (CNCC) was eliminated because it did not meet any of the selection standards. Facility 533 is not compatible with land use restrictions (airfield violations) and security because it does not have adequate 83-ft stand-off distances for AT/FP and the facility is in the Clear Zone. Likewise, it is not compatible with the communications mission because significant upgrades at 533 still would not provide adequate infrastructure to support new technologies. The alternative to demolish 533 and build the CNCC on it's site was also eliminated because it did not meet the selection standards; most importantly, the base mission and communications mission would fail because PAFB can not be without a communications control center and there would be no way to temporarily relocate cable and fiber until the new facility was constructed.

The alternative to re-configure the 920 RQW campus stormwater management systems from dry to wet detention was eliminated because it did not meet any of the selection standards. This alternative would not be compatible with the base mission, land use or safety as the wet systems create areas that are harder to retrofit in the future should changes be required and

increase the potential for bird aircraft strike hazard with surface water attraction by birds. Additionally wet detention systems become more of an environmental concern as wetland vegetation and wildlife pioneer or move into the waters and then become more of a maintenance issue (biomass disposal) with increase hazards to wildlife (crossing roadways, etc.).

ADP IV: Mid Base Military Recreational

Alternatives considered were carried forward for analyses and can be found in Section 4.0.

ADP V: Mid Base East Support

The alternative to expand and upgrade the existing fire station, facility 810, was eliminated because it was not compatible with the base mission, land use, safety, security, and environmental concerns because this location this facility is outdated, minimally meets fire protection requirements, and sustains flood damage after every major storm due to its location at a lower elevation than the surrounding area. The cost to upgrade and expand 810 would not provide the value necessary to achieve and exceed updated fire protection and AT/FP standards that will be reached with construction of a new facility. The other alternative to build the new fire crash rescue station next to the existing facility on an elevated site (and then demolish 810) was eliminated because the site, even elevated, is not compatible with land use, the mission, and environmental concerns as it would not provide enough room for a training area and appropriate stormwater management. Additionally, the cost of elevating the site and building the new facility without a training area would not provide efficiencies and value achieved by providing a fire crash rescue station and training complex.

The alternative to demolish 313 would be more economical than renovation due to the extensive work that will be required to bring this over 50 year old facility up to expected energy efficiency and updated codes. However, demolition of 313 will be considered an adverse effect by the State Historic Preservation Office (SHPO) and mitigation requirements will entail developing a case study of alternatives similar to what is being required for other historic resources/facilities proposed for demolition. This alternative is not reasonable at this time because it doesn't meet standard 4, cultural concerns, but will be analyzed through separate NEPA documentation once it is determined if it may be compatible with the base mission and land use.

The alternative to consolidate all vehicle maintenance at CCAFS was eliminated because it did not meet mission, land use, or safety compatibilities. A PAFB location is needed to meet Air Force vehicle accountability metrics and PAFB missions that require equipment maintenance and vehicle personnel. Critical PAFB equipment can't be off-line for more than 12 hours per mission requirements. Additionally, there is no value in moving the function to CCAFS.

The alternative to consolidate CE shops in the former contractor laydown yard (riverside industrial) was eliminated because it did not meet the standards of mission and land use compatibility, safety, security and environmental concerns. This location would be impacted by the indoor firing range (land use, safety and security) under construction, and is not compatible with the 920 Campus in this area. Currently several facilities are being used by CE for storage because there are no existing facilities that are large enough to house all CE shop and

administration equipment and supplies. This area is not large enough for consolidation considering all the adjacent incompatibilities.

There were no alternatives proposed for expansion of Facility 1060 (CE administrative) because administrative space will be minimal in the future CE shops complex, and the addition to 1060 will help consolidate CE administrative functions and move personnel from five different locations on base into one central location.

The alternative to construct an addition on to Hangar 985 or 986 was eliminated because it did not meet the selection standards of safety, security, environmental concerns, and cultural concerns. Critical safety issues will occur with increased exposure to equipment and personnel to the elements with the inability to provide hard barriers when the addition is occurring. Environmental concerns will increase as wildlife is able to more easily access the hangars during the work and may become injured or trapped inside, and increased opportunities for human contact may raise the potential for harm. Also, significant cultural concerns will be elevated as these hangars are historic resources and case studies will be required for mitigation, whereas this concern will be eliminated by building a separate warehouse.

ADP VI: South Base Community Support (including Golf Course and Marina)

The alternative to completely renovate Facility 408 was eliminated because it was not compatible with the base mission or land use, safety, environmental concerns and cultural concerns. This facility is outdated, is not sufficient to meet veterinary service needs, and is within an administrative district instead of the medical support area. The cost to renovate this facility and provide current veterinary medicine technology outweighs new construction. This facility is also becoming a safety issue due to its deteriorating materials (over 50 years old) and is more of an environmental concern due to heavy metal based paint use over the years and higher pesticide usage to control termites. A new veterinary clinic is proposed in the medical support area in ADP VI, and this facility can then be demolished.

The alternative to expand the marina and add new, larger slips thus increasing vessel capacity in wet storage was eliminated because it did not meet the environmental concern selection standard. Prior communication with regulatory agencies (USFWS, USACE, and State agencies) after the approval of the Brevard County Manatee Protection Plan in 2003 resulted in the understanding that marina expansions would not be approved for this area that PAFB falls within along the Banana River because it is within Florida Outstanding Waters, is designated an Aquatic Preserve, and significant numbers of sighted manatees and high mortality records (boat strikes) exist. Significant impacts were anticipated and regulatory constraints were engaged for manatee protection. Impact analyses was considered a wasted effort considering the known rejection for marina expansion.

The alternative to move all the munitions storage to CCAFS was eliminated because it did not meet mission compatibility, safety, and security requirements. Munitions storage is necessary at PAFB to safely store and transport munitions used for deployments and rescue operations out of PAFB. Greater safety and security risks exist with transporting munitions to and from CCAFS, an hour away from PAFB. This alternative would increase costs, delay missions, and there would be no value in consolidating munitions storage at CCAFS.

The alternative to use North Housing as an alternate site for a new Collocated Club (demo houses along riverside) was eliminated because the housing privatization deal locked up this area until the year 2058. The lease terms are set and housing is at 95% occupancy, and a change to the lease terms is not reasonable at this time. The other alternative site was within the footprint of the former Officers Club on the beach (ADP II). This site was eliminated due to safety and security issues due to the inability to have appropriate AT/FP setbacks from the very close SRA1A in addition to the significant cost and risk with construction in the 100-yr floodplain. The final alternative for a new Collocated Club was to demolish the Dining Hall (riverside location, but not in the 100-year floodplain) and build the Club on this site. A recent contract to privatize the Dining Hall was written which prevents this demolition. The contract is set and the company has been successful at raising patronage, and is providing a consistent, economical food service for base personnel that is not losing money. This alternative is not reasonable through the five years of this analysis.

The alternative to close the marina clubhouse and emphasize the golf course clubhouse was eliminated because it would reduce QOL amenities expected by marina patrons. These patrons are mostly active and retired military personnel that spend a lot of time with their boats and have come to expect the amenities of the club including late night use that is not offered at the golf course clubhouse.

Airfield

The alternative to close the airfield was eliminated because it would not support the base mission and the cost to close the airfield, relocate all the flying missions and re-route transient flying operations and training would be exorbitant. The cost of the proposed action to provide upgrades and pavement renovations would roughly costs \$2M/year over the five years compared to roughly \$300M over five years.

South Housing

The alternative to renovate the former fire station instead of demolishing it was eliminated because it did not meet mission and land use compatibilities nor address safety and environmental concerns. This facility is no longer needed, there is no functional use for it, it has the potential to become a safety hazard as maintenance is unable to keep up with deterioration, and the cost to renovate it outweighs the cost of new construction. The alternative to use portable restrooms instead of building restrooms for the soccer fields was eliminated because it did not meet land use compatibilities, is in violation of Air Force requirements to eliminate temporary structures, did not address safety and environmental concerns, and did not satisfactorily meet QOL needs.

2.4 Summary of Potential Environmental Issues

The general goals and objectives for installation natural and cultural resource management ensure that environmental impacts are reduced and/or eliminated. The PAFB General Plan references these guiding goals and objectives, but did not fully integrate these principles in the design concepts illustrated in the ADP figures in the preceding pages as the GP was developed with a more idealist vision. Follow-on impact analyses documentation in review of designs and external permitting will occur and minor impacts will be eliminated or reduced as much as

practicable. If scope changes occur for some future individual actions, additional detailed environmental analysis and recommendations of feasible alternatives prior to construction and/or implementation will be required.

Ten broad environmental components were initially considered to provide a context for understanding the potential effects of the Proposed Actions and Alternatives, and as a basis for assessing the significance of potential impacts. The areas of environmental consideration were air quality, biological resources, cultural resources, geology and soils, water resources, hazardous materials and waste, safety and health (including noise), infrastructure and transportation, land use and AICUZ, and socioeconomics.

No significant impacts from implementation of the proposed actions, the identified alternatives or no action alternatives have been identified for any of the environmental aspects examined in this document. Brief overviews of these aspects are found in Section 3.0. Detailed analyses of potential impacts are presented in Section 4.0. Analyses for several proposed projects have been analyzed in separate Environmental Assessments listed in Section 1.5, and are incorporated by reference.

The three levels of impact utilized in this document are defined as follows:

- No Impact - No impact is predicted.
- Not Significant Impact - An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource.
- Significant Impact - An impact is predicted that meets the intensity/context significance criteria for the specific resource.

3.0 AFFECTED ENVIRONMENT

In compliance with NEPA and CEQ guidelines, the USAF, 45 SW, has described the affected environment, and evaluated potential environmental effects resulting from the proposed actions, alternatives and the no action alternative in this EA. Prior NEPA documents prepared by the USAF have been incorporated by reference. This section serves as a baseline from which to identify and evaluate potential environmental impacts resulting from implementation of the Proposed Actions. An overview of aspects and discussion of information not included in prior NEPA documents related to PAFB development is included in this section.

3.1 Air Quality

Air Force Instruction (AFI) 32-7040, *Air Quality Compliance and Resource Management*, identifies USAF requirements for an air quality compliance program. Other applicable air quality requirements and criteria are identified in Tables 3-1 and 3-2.

Table 3-1: Summary of Air Quality Requirements

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
NAAQS 40 CFR Part 50 NAAQS Implementation Plans 40 CFR Part 51	Clean Air Act (CAA, as amended in 1990) requires U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment.	USEPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, called "criteria" pollutants (carbon monoxide, lead, nitrogen dioxide, particulate matter (PM10), particulate matter (PM2.5), ozone, and sulfur dioxide).	USEPA
FAAQs Florida Administrative Code (FAC), Chapter 62	CAA gives states the authority to establish air quality rules and regulations.	These rules and regulations must be equivalent to, or more stringent than, the federal program.	FDEP, Division of Air Resource Management
Title V of the Clean Air Act 40 CFR Part 70	Designed to improve compliance by clarifying what facilities (sources) must do to control air pollution.	Permits include pollution-control requirements from federal or state regulations that apply to a source.	USEPA, FDEP, Division of Air Resource Management

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
NESHAPs Section 112 of CAA 40 CFR Parts 61 and 63 (61 Subpart M, including National Emissions Standards for Asbestos)	National Emissions Standards for Hazardous Air Pollutants (NESHAPs) are emissions standards set by the USEPA for an air pollutant not covered by NAAQS that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness.	The standards for a particular source category require the maximum degree of emission reduction that the USEPA determines to be achievable, which is known as the Maximum Achievable Control Technology (MACT).	USEPA
AFI 32-7086, Chapter 4	Minimize loss and conduct recovery, recycling, and reuse of ozone depleting substances (ODS) to the maximum extent practicable.	Manage to minimize releases of ODSs into the environment.	USAF
AFI 32-7040	Estimate air emissions for inclusion in the Air Emissions Inventory	Track vehicle/equipment use and welding/soldering activities.	USAF

Patrick Air Force Base (PAFB) is currently authorized to operate under the Florida Department of Environmental Protection (FDEP) Title V Air Permit No. 0090021-003-AV, renewed in 2007. The permit is valid for a five-year period and will expire on 30 April 2012, at which time it will be renewed again.

Major sources of pollutants at PAFB include steam boilers, surface coating operations, and storage tanks. Other sources of pollutants at the base are considered insignificant activities under Title V rules as only stationary sources are considered. For Title V purposes a major source of air emissions has the potential to emit (PTE) in excess of 100 tons per year (tpy) of any criteria air pollutants, 25 tpy for total hazardous air pollutants (HAPs) or 10 tpy for a single HAP. PAFB is currently operating as a synthetic minor generator of HAP emissions under federally enforceable operating limitations. Most construction activities aren't required to be reported through Title V permitting because these actions aren't generating pollutants from a stationary source. Mobile sources, aircraft operations, and outdoor weapons training are some examples of other activities at PAFB that generate pollutants. Air emission inventories for PAFB have indicated that particulate matter (PM) has become a major criteria air pollutant when considering the increased construction/demolition activities that have been occurring in the past three years. Greenhouse gas emission reduction through energy efficiency and sustainability, however, is the goal of the Federal government recently mandated through Executive Order 13423, *Strengthening Federal Environmental, Energy and Transportation Management*. Currently there are no published thresholds of significance for greenhouse gas emissions, but

the Federal government recognizes the need to reduce energy consumption and shift to renewable and alternative fuels to reduce emissions. Energy improvements such as replacement of old HVAC equipment, installation of energy management controls, and metering for energy use are being implemented at PAFB and are expected to eliminate millions of tons of greenhouse gases annually once completed. Air quality analyses are found in Sections 4.2 and 4.9.

Ambient Air Quality

The USEPA has established National Ambient Air Quality Standards (NAAQS) for six principle pollutants under 40 CFR Part 50. The NAAQS consists of primary standards and secondary standards. The primary standards have been established to protect human health. The secondary standards have been established to protect the public welfare. The standards have been established for six principle pollutants, which are referred to as "criteria" pollutants. The criteria pollutants include ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter less than 2.5 or 10 microns (PM_{2.5}, PM₁₀), and lead (Pb). Criteria air pollutant emission data for Brevard County and PAFB for 2002 was extracted from the EPA AirData website (<http://www.epa.gov/air/data/repesco.html>) and presented in Table 3-2.

Table 3-2: Criteria Air Pollutant Data for PAFB and Brevard County, FL

Location	Emissions Year	Air Emissions (Tons)							
		CO	NOX	VOC	SO ₂	PM _{2.5}	PM ₁₀	NH ₃	Total
	2002								
PAFB		1.16	1.41	33	0.02	0.17	0.17	0.07	36
Brevard Co.		218,319	46,403	45,561	25,865	6,712	13,350	1,527	357,737*
	2002	Sum of 188 HAPs Emissions (lbs/yr)				Sum of 33 Urban HAPs Emissions (lbs/yr)			
PAFB		0.0011				0.0011			
Brevard Co.		16,722,681				3,351,360			

* Totals are sum of Point Source Emissions and Nonpoint + Mobile Source Emissions

The FDEP has adopted the Federal NAAQS to regulate ambient air quality in the state of Florida. In addition, the FDEP has promulgated state Ambient Air Quality Standards (AAQS) (FAC Chapter 62-204). Table 3-3 on the following page presents the NAAQS and AAQS for the regulated criteria pollutants.

Table 3-3: Summaries of National Ambient Air Quality Standards and Florida Ambient Air Quality Standards

Pollutant	Averaging Period	Florida AAQS	Primary NAAQS	Secondary NAAQS
Carbon Monoxide (CO)	8-Hour	9 ppm (10,000 µg/m ³)	9 ppm (10,000 µg/m ³)	--
	1-Hour	35 ppm (40,000 µg/m ³)	35 ppm (40,000 µg/m ³)	--
Lead (Pb)	Quarterly ^a	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual ^a	100 µg/m ³ (0.05 ppm)	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)
	1-Hour	--	0.100 ppm	--
Ozone (O ₃) ^f	1-Hour ^b	0.12 ppm	0.12 ppm	0.12 ppm
	8-Hour ^c	--	0.08 ppm	0.08 ppm
Particulate Matter (PM ₁₀)	Annual ^a	50 µg/m ³	50 µg/m ³	50 µg/m ³
	24-Hour ^b	150 µg/m ³	150 µg/m ³	150 µg/m ³
Particulate Matter (PM _{2.5}) ^f	Annual ^a	--	15 µg/m ³	15 µg/m ³
	24-Hour ^d	--	65 µg/m ³	65 µg/m ³
Sulfur Dioxide (SO ₂)	Annual	60 µg/m ³ (0.02 ppm)	0.03 ppm	--
	24-Hour ^e	260 µg/m ³ (0.10 ppm)	0.14 ppm	--
	3-Hour ^e	1,300 µg/m ³ (0.5 ppm)	--	0.5 ppm
	1-Hour ^e	--	0.075 ppm	--

Notes:

- a. Arithmetic mean
- b. Not to be exceeded on more than an average of one day per year over a three-year period
- c. Not to be exceeded by the three-year average of the 4th highest daily maximum
- d. Not to be exceeded by the three-year average of the 98th percentile of the 24-hour averages
- e. Not to be exceeded more than once per year
- f. Please refer to 40 CFR 50 regarding the final promulgation of the 8-Hour ozone and PM2.5 standards.

Regional Air Quality

Air quality is defined as either "in attainment" or "nonattainment" with respect to regulatory air quality standards. If the concentration of one or more criteria pollutants in a geographic area is found to exceed regulated or 'threshold' level for one or more of the NAAQS, the area may be classified as a nonattainment area. Areas with concentrations of criteria pollutants that are below the levels established by the NAAQS are considered either in attainment or unclassifiable areas. Criteria pollutants that are identified in Florida as causing health effects at concentrations above thresholds established as safe are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide.

In Florida, regional air quality is assessed at the county level. PAFB is located within Brevard County which has been designated by both the USEPA and FDEP to be in attainment for all criteria pollutants. Ambient air monitoring records from monitoring stations maintained by the appropriate state or local agency for the affected environment were examined to characterize the existing air quality. However, several sources of air emissions were considered that could be produced from implementation of the Proposed Action. The installation of any new air emission sources (boilers, laboratory emissions, etc.) will be coordinated through 45 Asset Management/Environmental for permit determination. FDEP requires an air permit to be in place prior to the initiation of construction of any facility that may reasonably be a source of air pollution. Upon receipt of a construction permit, PAFB may be required to update the Title V Air Permit to include any new sources of air emissions. However, changes in local air quality resulting from these sources would not be significant. Table 3-4 on the following page shows USEPA compiled data for 2005, 2006 and 2007 for monitored air concentrations in Brevard County, FL, for NAAQS selected pollutants.

1
2

Table 3-4: Summary of Air Quality Monitoring for 2005, 2006, and 2007

Year	State/ County	2000 Population	CO 8-hr (ppm)	Pb Qmax ($\mu\text{g}/\text{m}^3$)	NO ₂ AM (ppm)	O ₃ 1-hr (ppm)	O ₃ 8-hr (ppm)	PM ₁₀ 24- hr ($\mu\text{g}/\text{m}^3$)	PM _{2.5} Wtd AM ($\mu\text{g}/\text{m}^3$)	PM _{2.5} 24-hr ($\mu\text{g}/\text{m}^3$)	SO ₂ AM (ppm)	SO ₂ 24-hr (ppm)
2005	Brevard County, FL	476230	ND	ND	ND	0.081	0.072	48	8.3	18	ND	ND
2006	Brevard County, FL	476230	ND	ND	ND	0.089	0.077	26	9	28	ND	ND
2007	Brevard County, FL	476230	ND	ND	ND	---	0.068	34	7.3	20	0.001	0.005
CO - Highest second maximum non-overlapping 8-hour concentration (applicable NAAQS is 9 ppm)												
Pb - Highest quarterly maximum concentration (applicable NAAQS is 1.5 $\mu\text{g}/\text{m}^3$)												
NO ₂ - Highest arithmetic mean concentration (applicable NAAQS is 0.053 ppm)												
O ₃ (8-hour) - Highest fourth daily maximum 8-hour concentration (applicable NAAQS is 0.075 ppm)												
PM ₁₀ - Highest second maximum 24-hour concentration (applicable NAAQS is 150 $\mu\text{g}/\text{m}^3$)												
PM _{2.5} - Highest weighted annual mean concentration (applicable NAAQS is 15 $\mu\text{g}/\text{m}^3$)												
- Highest 98 th percentile 24-hour concentration (applicable NAAQS is 35 $\mu\text{g}/\text{m}^3$)												
SO ₂ - Highest annual mean concentration (applicable NAAQS is 0.03 ppm)												
- Highest second maximum 24-hour concentration (applicable NAAQS is 0.14 ppm)												
ND - Indicates data not available												
IN - Indicates insufficient data to calculate summary statistic												
Wtd - Weighted												
AM - Annual mean												
Qmax - Quarterly maximum												
$\mu\text{g}/\text{m}^3$ - Units are micrograms per cubic meter												
ppm - Units are parts per million												

3.1.1 Greenhouse Gases and Climate Change

Greenhouse gases (GHG) are components of the atmosphere that contribute to the greenhouse effect and global warming. Some GHG occur naturally in the atmosphere, while others result from human activities such as the burning of fossil fuels. Federal agencies, states, and local communities address climate change by preparing GHG inventories and adopting policies that will result in a decrease of GHG emissions. According to the Kyoto Protocol, there are six GHGs: carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (United Nations Framework Convention on Climate Change [UNFCCC], 2007). Although the direct GHG (CO₂, CH₄, and N₂O) occur naturally in the atmosphere, human activities have changed GHG atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2004, concentrations of CO₂ have increased globally by 35 percent. Within the US, fuel combustion accounted for 94 percent of all CO₂ emissions released in 2005. On a global scale, fossil fuel combustion added approximately 27 x 10⁹ metric tons (30 x 10⁹ tons) of CO₂ to the atmosphere in 2004, of which the US accounted for about 22 percent (USEPA, 2007a). The first time climate change was recognized as a problem was in 1979, and issues were discussed at the First World Climate Conference (United Nations Environment Programme 1990). The Intergovernmental Panel on Climate Change, established by the United Nations and the World Meteorological Organization, is a scientific body that reviews and assesses scientific, technical, and socio-economic information to understand climate change. In 1992, the U.S. signed and ratified the United Nations Framework Convention on Climate Change.

Since 1900, the Earth's average surface air temperature has increased by about 1.2° to 1.4° F (0.7° to 0.8° C). The warmest global average temperatures on record have all occurred within the past 15 years, with the warmest two years being 1998 and 2005 (USEPA, 2007b). U.S. emissions have increased at an average annual rate of 0.4 percent since 1990 (USEPA, 2011). Currently there are no published thresholds of significance for greenhouse gas emissions, but the Federal government recognizes the need to reduce energy consumption and shift to renewable and alternative fuels to reduce emissions. The Department of Defense is developing a uniform accounting system for GHG emissions. Air quality analyses are found in Sections 4.2 and 4.9.

3.2 Biological Resources

The USAF is committed to the long-term management of all natural areas on its installations, as directed by Sikes Act and AFI 32-7064, *Integrated Natural Resources Management*. Long-term management objectives are identified in the 2009 *45 SW Integrated Natural Resource Management Plan* (45 SW INRMP) with specific land-management objectives such as conservation of threatened and endangered species, habitat restoration, and wetland protection. The 45 SW INRMP is available through the 45 SW Environmental/Natural Asset Management office (45 CES/CEAN, refer to Section 1.5 for a point of contact). Specific natural resource requirements related to the Proposed Actions are identified in Table 3-5 on the following page.

Table 3-5: Summary of Natural Resource Requirements

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
Endangered Species Act 16 U.S.C. § 1531, et seq.	Consultation with U.S. Fish and Wildlife Service (USFWS), and if necessary, obtain and comply with biological opinions/incidental take permits, comply with existing T&E permits	Conserve ecosystems that support T&E species. Section 7 requires Federal agencies to insure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat.	USFWS
Coastal Zone Management Act 16 U.S.C. § 1451, et seq.	Coordination with FDEP and Federal Consistency Determination	Consistent with FL State Coastal Management Plan to conserve and protect coastal environment through standards and criteria for regulations and guidelines for uses of the coastal zone. Includes requirements through permitting for beach compatible sand for fill, beach profiling, turbidity monitoring, etc.	NOAA & FDEP
Sikes Act 16 U.S.C. § 670, et seq.	Cooperation between the Department of Interior and Department of Defense (DoD) with State agencies to plan, develop and maintain fish and wildlife resources on U.S. military installations	Development of an Integrated Natural Resource Management Plan (45 SW properties) that is reviewed/approved by USFWS, NMFS, & FDEP/FWC	DoD
Migratory Bird Treaty Act 16 U.S.C.; § 703-712	Consult with USFWS as necessary and comply with applicable permits	Prohibits destruction of the eggs or nest of migratory birds without a permit.	USFWS
AFI 32-7064	Long-term management of all natural areas on the Installation	Protect listed species, biodiversity, wetlands, etc.	USAF
Executive Order (EO) 11988	If the only practicable alternative requires siting in a floodplain, design or modify proposed action to minimize potential harm and prepare Finding of No Practicable Alternative	Reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore/preserve the beneficial values served by floodplains. Consider alternatives to avoid adverse effects in the floodplains.	DoD
Executive Order (EO) 13112	Remove and control invasive species	Prevent the introduction & provide control of invasive species. Minimize the economic, ecological, and human health impacts that invasive species cause.	DoD
45 SW Instruction 32-7001	Use full cut off, well shielded, low wattage, low pressure sodium or amber lights	Reduce the amount of exterior lighting visible from the beach during the sea turtle nesting season (1 May – 31 October) from 2100 to 0600 to reduce sea turtle disorientation or mortality.	45 SW

The following information on existing biological resources that may be affected by the Proposed Actions was derived from several sources; much of the information included has been extracted from the *45 SW INRMP*, survey data collected for threatened and endangered species, and references found in Section 6 in this EA.

The Proposed Actions with implementation of the PAFB General Plan and two projects in the South Housing area occur mostly within disturbed areas previously impacted by development. However, some actions do occur within coastal habitat such as dunes and their associated vegetation and communities, the sand beach which includes wildlife nesting and foraging habitat, and aquatic habitats found in the PAFB Marina which connects with the Banana River as well as upland ditches/canals.

Threatened, Endangered and Special Concern Species

No Federal-listed Threatened and Endangered (T&E) plant species have been identified at PAFB. The following plants listed by the State of Florida have been observed on PAFB's upper beach/dune: beach star, inkberry, and prickly pear cactus. For a comprehensive list of species known to occur near or within PAFB boundaries refer to the *45 SW INRMP*.

There is no formally designated critical habitat on PAFB, as defined under Section 4 of the Endangered Species Act (ESA). The current Federal and State of Florida T&E and special concern species that have been observed in the Proposed Actions areas include, but aren't limited to: Florida manatee (*Trichechus manatus latirostris*), Atlantic loggerhead turtle (*Caretta caretta*), Atlantic green sea turtle (*Chelonia mydas*), leatherback turtle (*Derموchelys coriacea*), hawksbill turtle (*Eretmochelys imbricata*), wood stork (*Mycteria americana*), gopher tortoise (*Gopherus polyphemus*), Eastern indigo snake (*Drymarchon corais couperi*), American alligator (*Alligator mississippiensis*), little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), white ibis (*Eudocimus albus*), southeastern American kestrel (*Falco sparverius paulus*), Arctic peregrine falcon (*Falco peregrinus tundrius*), American oystercatcher (*Haematopus palliatus*), bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis*), least tern (*Sterna antillarum*), and black skimmer (*Rynchops niger*). Appendix D of the *45 SW INRMP* contains detailed descriptions of these species. The species that have the potential to be affected by the Proposed Action are sea turtles, manatee, wood stork, Eastern indigo snake, and gopher tortoise.

Protected T&E sea turtles are found on the beaches and within the Atlantic Ocean waters east of PAFB. Sea turtle nesting season along Brevard County coasts occurs each year from May 1st through October 31st. Sea turtle nesting/ hatching activity on PAFB has been documented for over twenty years with a range in total sea turtle nest numbers annually from 608 to 1,993 of loggerhead, green, and leatherback species. Nesting patterns at PAFB follow the same trends seen in Peninsular Florida nesting data.

Artificial lighting is known to cause disorientation (loss of bearings) for sea turtles as a result of confusion of artificial lighting with natural moon lighting on the ocean's breaking waves. Additionally, reductions in sea turtle nesting activities have been documented on beaches illuminated by artificial lighting (Witherington 1992). Hatchlings are easy prey once disoriented or can become dehydrated or waste enough resources that they are unable to sustain themselves as they make their journey hundreds of miles out to sea. Artificial lighting is proposed to be installed

for the majority of the projects over the course of five years of development at PAFB under the General Plan. Additionally, dune crossover and lookout pavilion construction is proposed within the dune/beach area. Consultation with the USFWS under Section 7 of the Endangered Species Act is required if Federal agency actions may affect listed species or critical habitat. In the case of light management by the 45 SW, formal consultation must be re-initiated if the amount or extent of incidental take exceeds that allotted in the active Biological Opinion received for sea turtle protection through light management (FWS Log #41910-2009-F-0087).

The Florida manatee is a marine mammal that is found in marine, estuarine, and freshwater habitats, and is generally restricted to the southeastern United States. Habitat areas include foraging, freshwater drinking, and resting sites, travel corridors, etc. Manatees are herbivores that feed opportunistically on a wide variety of plants included submerged, floating and emergent vegetation. The Florida manatee is Federally listed as endangered due to the low population level within the continental United States. The USFWS has designated the Indian and Banana Rivers as critical manatee habitat due to the presence of warm water refuges, seagrass beds for foraging, and protected areas in the north Banana River with limited boat access. No critical habitat occurs on PAFB property. Manatees have been observed adjacent to PAFB's western shoreline in the Banana River, in the PAFB Marina and the deep Survival Canal. The Survival Canal is used by manatee generally for resting as it is secluded, deeper water away from motorized vessels and excessive human disturbances. The PAFB Marina seems to be used by manatees as a freshwater source as stormwater drainage canals flush from the south end of base into the Marina. The most significant problem presently faced by manatees in Florida is death or injury from boat strikes (FWS 2001). Brevard County has the highest number of manatee watercraft-related mortalities of any county in Florida (FWS 2001).

The American wood stork, a Federally endangered species, is a large, white, bald-headed wading bird of the southeastern swamps, and the only stork breeding in the United States. Its late winter breeding season is timed to the Florida dry season when its' fish prey become concentrated in shrinking pools. The wood stork eats small fish from 1 to 6 inches long, especially topminnows and sunfish provide this bird's primary diet. Feeding often occurs in water 6 to 10 inches deep where a stork can probe the waters/sediments with its bill partly open. Wood storks need periodic flooding and drying of the environment for successful rookeries. Reduction in wood stork numbers is attributed to loss of wetland habitat and changes in hydroperiods from human alterations with draining of wetlands with construction of canals, floodgates, etc. (FWS 1996). Wood stork have been observed occasionally foraging in some shallower canals in the interior of PAFB and resting along the banks of some of the PAFB Golf Course canals.

Eastern indigo snake, a Federally threatened species, is a large non-venomous snake that is distributed throughout central and South Florida with a preference for upland habitat. Burrows, utilized by indigo snake as shelter from cold and intense heat, have been found within PAFB, however no observations of indigo snake have occurred. Eastern indigo snake frequent pine flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, and coastal dunes, etc.

Gopher tortoises, a State threatened species, and their burrows are State protected and have been observed at PAFB. Burrows can be quite deep and long with average depth at 6.5 ft and average length at 15 ft, and can be utilized by more than 350 other commensal species such as

frogs, mice, snakes, and insects. The gopher tortoise can live up to 40 to 60 years, and is commonly found in habitats such as sandhill, pine flatwoods, scrub, scrubby flatwoods, dry prairies, xeric hammock, pine-mixed hardwoods, and coastal dunes. Gopher tortoise observations at PAFB have been in less developed areas such as the airfield and closed landfills.

The least tern, a State threatened species, arrives in Florida in the spring from South American wintering grounds. Least terns nest on beaches, dry mudflats, barren sandbars, and some sandy riverine beaches. Colony sites can be used year after year. However, least terns are highly affected by disturbance and will abandon nesting if humans or potential predators come within moderate distances to nesting sites. For this reason, least terns have adapted to nesting on flat roofs of buildings that generally provide a location with no disturbances. Black skimmers, a State species of special concern, generally breed in late spring through early fall and, like the least tern, nest on barren beaches of sand, gravel or shell, mudflats or sandy riverine beaches. Black skimmers are found in Florida year-round, and will also nest on roofs for the same reason least terns do. Also similar is that the food source of both species during nesting is small fish found in fresh, brackish or saltwater within close proximity to the nesting sites.

Essential Fish Habitat

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended, required interagency coordination to further the conservation of federally managed fisheries and for each Federal agency that may adversely affect Essential Fish Habitat (EFH) to consult with the National Marine Fisheries Service (NMFS) and identify EFH. The Act defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Estuarine emergent vegetated wetlands, tidal creeks, estuarine scrub/shrub, oyster reefs and shell banks, unconsolidated bottom (soft sediments), artificial reefs, coral reefs, and live/hard bottom habitats are EFH for specific life stages of estuarine dependent and near shore managed species. Regional Fishery Management Councils under the NMFS are responsible for designating EFH in their management plans. The South Atlantic Fishery Management Council (SAFMC) currently manages for several species in the vicinity of PAFB.

The SAFMC currently manages for postlarval and juvenile red drum (*Sciaenops ocellata*), white shrimp (*Litopenaeus setiferus*), pink shrimp (*Farfantepenaeus duorarum*), and brown shrimp (*Farfantepenaeus aztecus*) in the PAFB area. The Banana River area offshore of PAFB may also provide nursery and forage habitat for black drum (*Pogonias cromis*), Atlantic menhaden (*Brevoortia tyrannus*) and blue crab (*Callinectes sapidus*) that are prey for the SAFMC managed species of mackerels, snappers and groupers. Detailed information on the federally managed fish listed and their EFH is contained in the 1998 Amendment of the Fishery Management Plans for the South Atlantic (SAFMC 1998).

Submerged Aquatic Vegetation (SAV), i.e., seagrass, has been observed in the Banana River along PAFB's western shoreline by St. John's River Water Management District (SJRWMD). Seagrass transect field surveying off PAFB by SJRWMD has revealed three species of seagrass generally in patchy distribution with occasional dense beds in addition to several magroalgae species. Generally, SAV is not found in water depths 10 feet or greater due to light attenuation. Seagrass is a food source for manatees and sea turtles, and is considered prime

habitat for larval stages of fish and invertebrates. Seagrass has become an indicator species for water quality and health, and distribution and density assessments in the Indian River Lagoon system/watershed are being used to drive nutrient loading reductions and stormwater management regulations.

The SAFMC has also designated SAV as a Habitat Area of Particular Concern (HAPC) for postlarval/juvenile and subadult pink shrimp and postlarval/juvenile and subadult red drum in the Banana River. HAPCs are subsets of EFH that are rare, particularly susceptible to human-induced degradation, have special ecological importance, or are located in an environmentally stressed area. In addition to seagrass (SAV), mangroves (black, *Avicennia germinans*; white, *Laguncularia racemosa*; and red, *Rhizophora mangle*) that are within the water/shoreline interface are considered EFH because of the use of the roots by varying developmental stages of fish. Mangroves are found along the PAFB western shoreline and within canals connected with the Banana River, although they are noncontiguous and interspersed in between mostly herbaceous wetland vegetation. Florida laws also provide some protection to mangroves through the Mangrove Trimming and Preservation Act.

Wetlands and Floodplains

Wetlands are the transition zones between dry upland ecosystems and deeper aquatic habitats. Each wetland area is unique according to its surrounding geologic, hydrologic, and climatic conditions. Wetlands provide flood control, aquifer recharge, coastal protection, and act to help filter pollutants from the ecosystem. Wetlands often support a wide range of rare and endangered aquatic plants and wildlife. A wetland inventory was conducted on PAFB in the 1990s through the USFWS National Wetlands Inventory. This inventory resulted in classification of all surface waters on the PAFB, which are primarily excavated upland canals used for storm water drainage with little ecological value. A jurisdictional delineation was completed by the Army Corps of Engineers (USACE) in 2006. Figure 3-1 identifies the location of wetlands on PAFB based on the USACE delineation. This delineation addresses wetland systems on PAFB that have connections to known productive wetland systems, such as the Banana River. However, isolated wetlands have the potential to exist on PAFB, but are identified on a case-by-case basis through regulatory review of projects.

Section 1 of Executive Order 11990 *Protection of Wetlands*, directs each federal agency to provide leadership and take action and include all practical measures to minimize destruction, loss, degradation or harm to wetlands. Although no net loss of value and function of wetlands is the goal of any construction project, it is recognized by USEPA and the USACE that this goal may not be achievable in every permit action (USEPA 1990). Per EO 11990, the Proposed Action's effect on wetlands should consider factors such as public health, safety, water supply, pollution, long term productivity of existing flora and fauna, habitat diversity and recreational use. If it is determined that the only practicable alternative consistent with the law and with the policy set forth in this EO requires siting in a wetland, the agency is required to include all practical measures to minimize harm to wetlands.

A floodplain is the lowland adjacent to a river, lake, or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. Flood frequencies, such as the 100-year flood, are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Due to the lack of significant variances

in topography on PAFB, floodplains extend beyond the coastal dune and wetlands and into portions of the developed land on PAFB. Figure 3-1 displays the flood zone locations at PAFB.

Section 1 of Executive Order (EO) 11988, *Floodplain Management*, directs each federal agency to provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains (specifically 100-year) in carrying out its responsibilities for federally undertaken construction and improvement projects. If it is determined that the only practicable alternative consistent with the law and with the policy set forth in this EO requires siting in a floodplain, the agency is required to minimize potential harm to or within the floodplain which may include designing or modifying its action in order to reduce loss of property, and minimize the potential for the risk of loss of life. All areas adjacent to the Atlantic Ocean have base flood elevations from 12-16 ft (referenced from NGVD 1929) with associated coastal flooding and velocity hazards due to wave action. Areas along the western PAFB boundary adjacent to the Banana River, where seawalls don't exist, have base flood elevations from 3-5 ft with the central portion of North Housing with flood zone elevations of up to 9 ft. Several projects proposed in the General Plan occur in the 100-year floodplain and will be addressed specifically in Section 4.2.

Fish and other Fauna

Various species of wildlife inhabit, utilize, or frequent PAFB. The Installation is located on a barrier island and these types of ecosystems are important natural areas that support many plants, animals, and natural communities. Barrier islands along the Atlantic coast are especially important for nesting sea turtles, populations of small mammals, and as foraging and loafing habitat for a variety of resident and migratory shorebirds, wading birds, and songbirds. Specifically, 11 mammalian species, 16 amphibian and reptile species, and 62 bird species are known to occur on or in the vicinity of PAFB. Other species have been observed within canals that have connections with the Banana River such as black chin tilapia (exotic), mosquito fish, stingray, catfish, larval forms of amphibians, etc., dependent on water depths throughout the year. Raccoon, turtles, frogs, alligators, osprey, rabbits, etc., have also been observed within the Proposed Action areas. Refer to the 45 SW INRMP for specific information on fish and other fauna found at PAFB (it can be obtained from 45 SW Environmental; refer to Section 1.5 for point of contact).

Migratory Birds

PAFB is located along one of the major migratory flyways for neo-tropical migrants that breed in eastern North America. Therefore, habitat on PAFB that is suitable for migrant birds is of conservation concern. Migratory birds are protected under the Migratory Bird Treaty Act. There are no State recognized Important Birding Areas (IBA) at PAFB. During surveys conducted at PAFB in 1996 and 2007/2008, many neotropical migrants were observed using the dune habitat at PAFB. Species observed on/over PAFB beaches, include, but aren't limited to, sanderlings, black bellied plover, gulls, gannets, royal terns, least terns, lesser yellowlegs, pelicans, black skimmers, great blue herons, ospreys and ruddy turnstones. Most of the birds listed under the T&E section in the preceding pages are State listed shorebirds and wading birds which are also classified as migratory birds.

Vegetation

The majority of the vegetation on PAFB consists of turf and landscaped areas. Herbaceous vegetation is the dominant vegetation type and represents 43% of the land area within PAFB. The Banana River shoreline that acts as the western boundary of PAFB maintains a fair amount of natural sand beach lined with wetland/marsh grasses, shrubs and a noncontiguous distribution of mangroves. The beach and associated dune vegetation adjacent to the Atlantic Ocean acts as the eastern boundary of PAFB, and is comprised of an extensive amount of native vegetation from a fairly dense line of mature seagrapes to an assortment of other dune species except at the south end where the non-native invasive chaste tree (*Vitex trifolia*) has dominated.

The disturbance of land as well as bird ingestion of seeds and flight has facilitated the spread of invasive species. Brazilian pepper, Australian pine, and chaste tree are the dominant invasive vegetation species found on PAFB. Invasive removal programs have been successfully removing these species and herbicide treatments are attempting to eradicate or at least control their spread. FDEP and PAFB natural resource personnel have also identified the noxious aquatic weed, hydrilla (*Hydrilla verticillata*) in the canals at PAFB. Aquatic plants and algae such as muskgrass (*Chara* spp.), Southern naiad (*Najas guadalupensis* and *N. marina*), water primrose (*Ludwigia* spp.), duck potato (*Sagittaria lancifolia*), duckweed (*Lemna valdiviana*), and blue-green filamentous algae are found in and around drainage canals and ponds as well. An FDEP aquatic weed control permit is held by PAFB under 45 SW Environmental (45 CES/CEA).

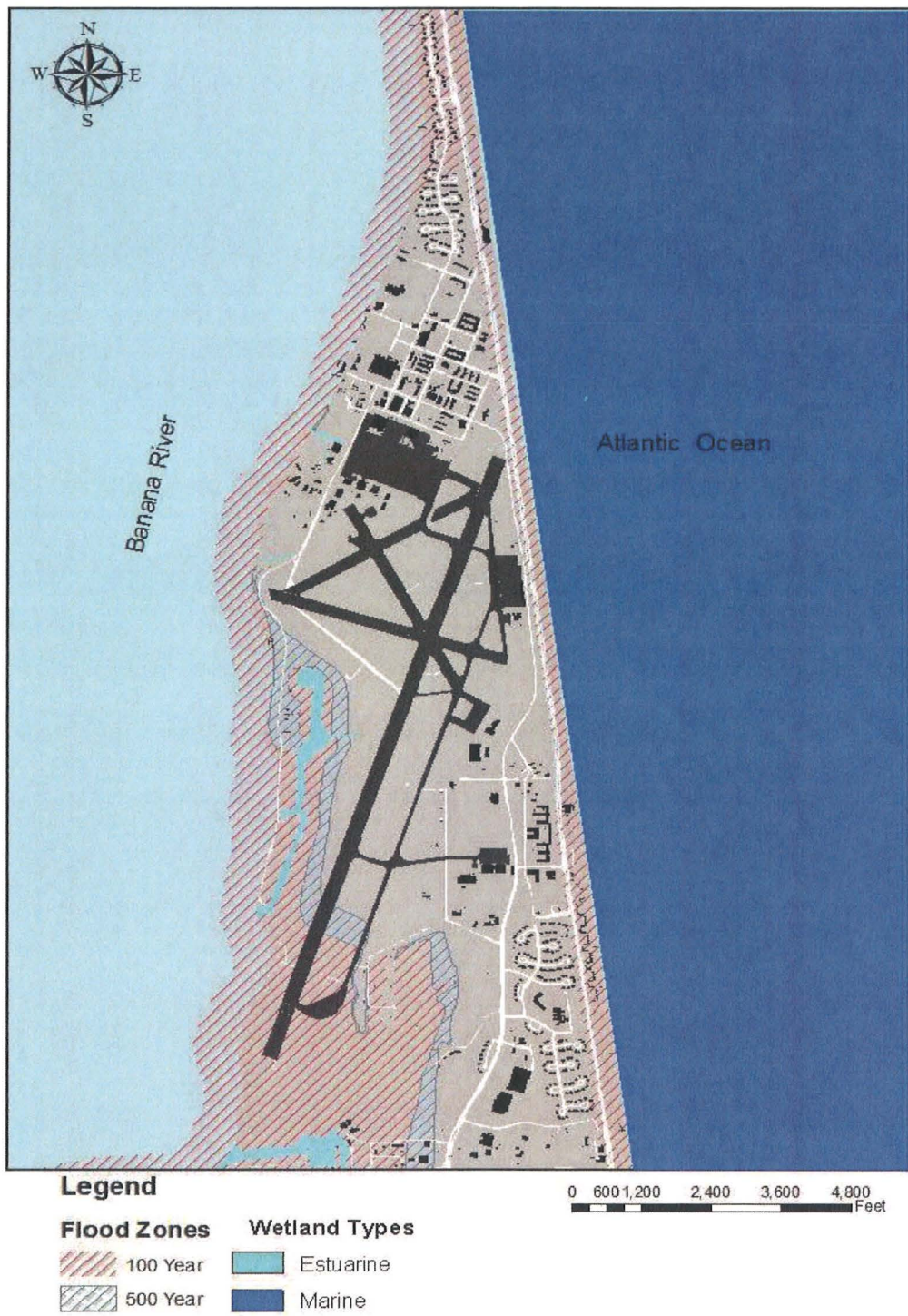


Figure 3-1: Floodplain and Wetlands Map for PAFB, FL

3.3 Cultural Resources

Cultural resources include prehistoric-archaeological, historic, architectural, and Native American resources. Areas of potential impact include properties, structures, landscapes, or traditional cultural sites that qualify for listing in the National Register of Historic Places (NRHP). Section 106 of the National Historic Preservation Act of 1966 (as amended) requires federal agencies to consider the effects of their actions on historic properties. AFI 32-7065, *Cultural Resources Management*, provides guidelines for the protection and management of cultural resources on U.S. Air Force managed lands.

There has been no systematic archaeological survey of PAFB, and there are no recorded sites within its boundaries. A reconnaissance study conducted by the National Park Service in 1982 found that the two shorelines at PAFB were severely disturbed due to past excavations, filling and paving activities, and that the remaining property at PAFB was either subjected to extensive earth moving or was developed. The study concluded that the likelihood that significant sites were preserved was limited and a cultural resource survey was not planned (Hulsted 1981).

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on Federally administered lands. The Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida have stated during review of the 45 SW Integrated Cultural Resource Management Plan that they do not wish to review or participate in any action unless it involves a prehistoric archaeological site or there is a Native American Graves Protection and Repatriation Act (NAGPRA) issue. PAFB has no recorded archaeological sites and no potential for NAGPRA issues.

Recent (2010/2011) Historical American Building Surveys have identified at least 29 structures and eight districts on PAFB as potentially eligible for listing on the NRHP. The four criteria used to determine eligibility of historic resources are association with significant historic events, association with lives of persons significant in the past, embodiment of distinctive characteristics of a type, period or method of construction, or the resource yields or is likely to yield important information about prehistory or history. PAFB was established in 1940 as the Banana River Naval Air Station, and World War II-era and Cold War buildings are found on the base. All structures built before 1959 (45 years old or older) are potentially eligible for listing in the National Register of Historic Places (NRHP). The 45 SW Cultural Resource Manager has been working with the State Historic Preservation Officer (SHPO) to obtain a current opinion of historic buildings and districts at PAFB so documentation and historic survey reports can be archived appropriately before demolition and planned renovation projects that have been developed through the fiscal years in association with the General Plan. The eight historic districts are the Banana River Naval Air Station Seaplane Historic District, Inert Storage Facility Historic District, High Explosive Storage Facility Historic District, PAFB Missile Instrumentation Station Historic District, Bomarc-SAGE Tracking Facility Historic District, PAFB Facilities Landplane Historic District, PAFB Administrative Historic District, and the South Patrick Housing Administrative Area Historic District. Each district consists of facilities/structures that are considered to be contributing elements/resources. Table 3-6 on the following page contains a list of potentially eligible historic buildings located on PAFB and their dates of construction. Appendix C includes SHPO responses concerning eligibility for PAFB facilities.

Table 3-6: List of Potentially Eligible Historic Buildings and Construction Dates

Bldg Number	Date of Construction	Bldg Number	Date of Construction	Bldg Number	Date of Construction
302	1940	536	1942	969	1963
303	1940	537	1942	970	1963
305	1940	545	1943	985	1953
313	1943	556	1945	986	1953
408	1955	557	1945	989	1959
410	1943	559	1951	990	1941
423	1959	560	1944	991	1956
425	1957	561	1945	996	1954
431	1942	562	1945	1315	1970
439	1945	623	1956	1316	1970
515	1942	627	1959	1322	1941
522	1944	630	1964	1327	1941
523	1942	632	1965	1330	1941
524	1942	734	1944	1425	1941
530	1942	750	1944	1432	1941
533	1959	751	1945	1435	1941
534	1942	810	1952	1437	1941
535	1942	965	1957	1440	1941
				3650	1959

3.4 Geology and Soils

Patrick AFB is located on a barrier island off the central east coastline of Florida. The barrier islands are a system of beach ridges that separate the Atlantic Ocean from brackish lagoons such as the Banana River, which forms the western boundary of PAFB. The island attains a maximum width of some 4.5 miles and is approximately 90 miles long. Land surface elevations across PAFB range from 0 to 15 feet above mean sea level (MSL), with the highest elevations corresponding to the sand dunes that parallel the Atlantic beachfront. From the dunes, the land slopes gently west toward the shorelines along the Banana River. Some artificially high locations are found close to the southern end of base along closed landfill cells developed from the 1950s to the 1970s.

The unconsolidated surficial materials, which underlie PAFB are the undifferentiated Pleistocene/Holocene deposits known as the Pamlico sands. These deposits are composed primarily of marine sands, which are sandy, well drained, and generally good for development; however, the stability of the soils near the Banana River is suspect. This instability limits construction to less intensive forms of development and requires soil boring prior to beginning construction projects. There is high susceptibility to erosion along both shorelines (PAFB General Plan 1996).

The bedrock underlying the base is considered to be all units that underlie the Pleistocene/Holocene deposits. The first such unit is encountered is the Anastasia Formation of Pleistocene age. This formation lies 10 feet below land surface (bls) and has a thickness of 20 feet. Its lithology is that of coquina and shell conglomerates, quartz sand and clay. Beneath the Anastasia is the Caloosahatchee Marl Formation. It is encountered at a depth of approximately 30 feet bls and is 50 feet thick. In the vicinity of the base, it is described as a gray to greenish-gray sandy shell marl with green clay and fine sand of Pliocene age. Underlying the Caloosahatchee Marl Formation is the Miocene age Tamiami Formation. However, the Caloosahatchee Marl Formation may locally overlie either the Tamiami or the deeper Hawthorn Group. The approximate thickness of the Tamiami Formation is 20 feet, and it is located 80 feet bls. It is composed predominantly of a white sandy limestone that is discontinuous in the region.

Soils in Brevard County have been surveyed and mapped by the United States Department of Agriculture, Soil Conservation Service in cooperation with the University of Florida (USDA 1974). The soil is sandy type to depths of 60 inches or more. The soil permeability is greater than 20 inches per hour; available water capacity is 0.02 to 0.05 inches per inch of soil. Soil reaction is 6.6 to 8.4 pH. Original vegetative cover consisted of saw palmetto, scrub live oak, and salt tolerant shrubs such as sea grape and Spanish bayonet. Soil tests made are representative of soils typed mapped. These tests indicate the soil has a high pH (7.5 – 8.0). Three soil associations are identified in the PAFB area: (1) Canaveral-Palm Beach-Welaka association; (2) Myakka-EauGallie-Immokalee association; and (3) Tidal Marsh-Tidal Swamp association.

The predominance of sandy soils generally prevents establishment of dense vegetation especially with periods of drought unless the vegetation is able to deeply root or has access to water. Wind erosion at PAFB can be minimized by establishing/planting vegetation and

maintaining it with irrigation during dry periods. The planting of trees and shrubs also provides windbreaks and reduces wind-blown sand from the beach and other forms of erosion.

The 45 SW Installation Restoration Program (IRP) manages regulated Solid Waste Management Units (SWMUs) at PAFB encompassing 29 sites that have some Land Use Controls (LUCs) or are under investigation or cleanup. Cleanup has been completed at over 150 sites, and they have been approved for "No Further Action" (NFA) under the regulatory review process through IRP, FDEP, and EPA. The SWMUs are listed on the PAFB Resource Conservation and Recovery Act (RCRA) Corrective Action permit and activities follow the RCRA corrective process. LUCs are established for sites where residual contamination is well-defined and remains in place, and may require special management practices should land disturbance be required. Future construction is not prohibited on/near SWMUs sites, however specific guidance is required through the 45 SW IRP to minimize spread of known contamination, comply with regulatory requirements, and protect personnel from safety and health hazards. Fact sheets for SWMUs with LUCs can be found at Appendix E.

In the North Base Administrative (ADP II) area there is one former laundry facility (SWMU P128) in addition to a water tank site (SWMU P129) that are in the process of being investigated for various solvent and heavy metal based paint soil contamination, respectively. These sites are small, and contamination appears to be limited to the immediate area of the source facilities.

In the Mid-Base River Industrial (ADP III) area there is a former fuel tank site (P133), former water tank site (P129), former automotive service station site (P036), and former hazardous waste storage building (P136) site that are in the process of being investigated and cleaned up. All of these sites are small, and limited to the immediate area of the source facilities' locations. Two SWMUs are present (P041 & P031) in ADP III with LUCs to maintain the area for industrial use because of soil and groundwater contamination due to former use of the area for surface evaporation of paint, solvents, and plating materials (heavy metals, volatile organic compounds [VOCs], semivolatile organic compounds [SVOCs], etc.). Finally, four other SWMUs are present (P035, P037, P040, P049) in the ADP III area with LUCs for on-going remediation and monitoring because of former fuel/petroleum contamination.

In the Mid-Base Military Recreational (ADP IV) area, the FAMCAMP now occupies the area of the former Skeet Range (SWMU P044), which was previously remediated to residential standards by the IRP. However, the adjacent Survival Canal (SWMU P173) still contains lead and clay pigeon residuals in the sediment in the northern section of the canal. Currently, Survival Canal access is restricted due to potential contaminated sediment disturbance concerns. The Recreation Area Concrete Staging Area/Recreation Dump (SWMU P065) is located southwest of the current FAMCAMP area along the Banana River and adjacent to the closed landfill (SWMU P026). The concrete staging area (P065) was investigated by IRP in the mid-1990s, again in 2010, and is still under investigation, however, with analysis of soil and groundwater sampling for VOCs, SVOCs, Polynuclear Aromatic Hydrocarbons (PAHs), metals, Total Petroleum Hydrocarbons (TPH), Total Dissolved Solids (TDS), and Ethylene Dibromide (EDB) resulting in no concerns, this site is anticipated to become a NFA. The Small Arms Range (SWMU P174) will be closing soon (2012) after construction is complete on the new Combat Weapons Training Facility; remediation is already funded to occur to remove lead contaminated sediments. After cleanup, the property will be classified as "No Further Action" and will be opened back up for development. Finally, in ADP IV, the closed landfill (P026) has

LUCs to prevent access and is fenced until the soil cap is considered consistent and adequate. A monoculture of invasive Brazilian pepper was removed from the landfill in 2007, and projects are occurring to restore the landfill with native vegetation and compost soil to allow future opening of a light recreational, day use WarFit exercise and trail system.

In the Mid-Base East Support (ADP V) area there are 3 SWMU sites that are under investigation and in the process of being cleaned up. Two of the sites are former transformer locations (P157 & P161), and polychlorinated biphenyls (PCB) contaminated soils are being cleaned up. The remaining site is under investigation due to former paving and ground storage (P176); this site will potentially be included in P045. SWMU P045 has LUCs to maintain the area for industrial use because of soil and groundwater contamination of pesticides, metals, and petroleum products due to former use of the area for storage of paving and grounds materials and equipment. Some contaminated soil was removed, and long-term monitoring is in place to determine if natural remediation is occurring through breakdown of the constituents over time.

Finally, in the South Base Community Support (ADP VI) area, five (5) SWMU sites are distributed throughout both the east and west sections. The west section has three (3) closed landfill units (P023, P024, P025) on the golf course and munitions storage area with LUCs that require the following of specific 45 SW IRP management conditions if excavation is required to prevent disturbance of landfill contents. The landfill cells were used between 1940 to 1961 for office, cafeteria, and industrial waste disposal. Contaminants detected were metals, mercury, pesticides, SVOCs, and PCBs. The east side of ADP VI has one (1) closed landfill unit (P022) with LUCs that are the same as the other four (4) landfill units on the west side, and one former transformer site (P167) that is in the process of having PCB contaminated soils removed.

3.5 Hazardous Materials and Waste

A material is hazardous when, because of its quantity, concentration, or physical, chemical, or infectious characteristics, it may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or temporary incapacitating illness, or pose a substantial present or potential hazard to human health or the environment. A wide variety of hazardous materials ranging from paint, solvents, adhesives, cleaners, metal treatments, and fuels are used on PAFB. The collection, management, transportation, and disposition of hazardous wastes are defined and strictly regulated by the Resource Conservation and Recovery Act (RCRA), as amended, and by applicable federal, state and Air Force regulations. All hazardous material purchases are required to be authorized. The materials are required to be tracked through the electronic Environmental Safety and Occupational Health Hazardous Material Information System (ESOHMIS). When improperly stored, transported, or otherwise managed, hazardous materials can significantly affect human health and safety and the environment.

RCRA requires “cradle to grave” hazardous waste management, including the regulation of generation, transport, treatment, storage and disposal of hazardous waste. RCRA identifies specific requirements for handling and disposing of hazardous wastes, including solvents commonly used in research laboratories and facilities. Regulations implementing the State of Florida’s hazardous waste program are found in Florida Administrative Code (FAC) Chapter 62-730. AFI 32-7042, *Solid and Hazardous Waste Compliance*, identifies compliance requirements for all solid and hazardous waste, except radioactive waste on Air Force installations. AFI 32-7086, *Hazardous Material Management*, establishes procedures and standards for

management of hazardous materials (HAZMAT) throughout the Air Force. The 45 SW Management Plan 19-14, *Waste Petroleum Products and Hazardous Waste Management Plan*, describes waste management procedures on PAFB including unit responsibilities, waste accumulation areas, permitted waste storage and treatment facilities, waste disposition, and spills and non-permitted releases.

Asbestos-containing materials (ACM) are present in buildings proposed for demolition or renovation. When asbestos poses a health danger from the release of airborne fibers (because it is in a friable state), Air Force policy (AFI 32-1052, *Facility Asbestos Management*) is to remove or isolate it. After demolition, and before a site can be considered environmentally safe (subject to the provisions of the Comprehensive Environmental Response, Compensation and Liability Act [CERCLA]), all friable asbestos will be encapsulated or removed, the site will be approved, and the asbestos waste disposed of in an approved landfill.

Polychlorinated biphenyls (PCBs) are suspected human carcinogens. Improper handling of PCB items or releases of PCBs could have adverse effects on human health and the environment. Liquid PCBs may be present in electrical equipment such as large high and low voltage switches, capacitors, hydraulic systems, or compressors in the buildings proposed for demolition or renovation. Some PCBs can be found in contaminated soils due to leaking of former, old transformers. The IRP office has been working to remediate former transformer sites that have these issues, and only three (3) sites are left for clean up based on recent investigations.

Hazardous waste streams at PAFB include batteries, solvents, metals, propellants, petroleum products, antifreeze, fluorescent and high intensity discharge lamps, and dental clinic waste (x-rays). All hazardous waste streams must be properly labeled, segregated and stored prior to disposal. Secondary containment must be used for all liquid hazardous wastes. All wastes must be segregated according to hazard class (e.g., corrosive acid, corrosive base, flammable, oxidizer, etc.). All storage containers and lids should be made of a material compatible with the chemical waste contents. All hazardous waste must be disposed of within six (6) months of the accumulation start date for small quantity generation sites. Large quantity hazardous waste management sites consist of a central accumulation point in which disposal occurs within three (3) months of accumulation start date.

The Pollution Prevention Act of 1990 (42 U.S.C. 13101(b)) established a National policy to prevent or reduce pollution at the source. The environmental implications of the Proposed Action activities will be considered during the design phase of each project to minimize or eliminate environmental liability, and a pollution prevention environmental analysis will be performed. All construction contracts are required to comply with AFI 32-7086, *Hazardous Materials Management*, and will ensure that all recyclable material (e.g., concrete) is recycled and recycled quantities reported by weight to 45 Asset Management/45 CES Environmental.

Contractors and all Subcontractors must comply with Air Force Green Purchasing Program (GPP) requirements. GPP is the purchase of environmentally friendly products and services (e.g., products made from recycled or recovered materials). Federal agencies, their contractors and subcontractors are required, whenever practicable, to maximize the purchase of GPP products and services specifically products made from recovered or recycled materials and Energy Star or Federal Energy Management Program-designated energy efficient products

(Executive Orders 13101, 13134, 13221, 13148, RCRA 6002, EPACT 2005 and the Farm Security and Rural Investment Act of 2002),. Products made from recovered or recycled materials can be found at the USEPA Comprehensive Procurement Guide (CPG) web site at <http://ofee.gov/gp/gp.asp>. The CPG lists "Environmental Protection Agency (USEPA) Designated Guideline Items" containing minimum recycled or recovered materials content according to RCRA 6002 and EO 13101 (<http://www.ofee.gov/>). Prior to project closeout, the design engineer and the contractor will provide a completed copy of the Recovered Materials Determination Form (RMDF) to document purchases of designated guideline items or will provide a justification as to why designated guideline items were not utilized. The RMDF form will be placed into the contract file at contract closeout. GPP requirements will also take consideration of life cycle costing, i.e., the cost of a product, including capital, installation, operating, maintenance, and disposal costs over the lifetime of that product.

The Installation Integrated Solid Waste Management (ISWM) program has established a Qualified Recycling Program (QRP) and ensures that it is operated and maintained in accordance with 10 U.S.C. 2577, 32 CFR Part 172, DoDI 4715.4, and AFI 32-7042. ISWM includes municipal solid waste (MSW) pick up and disposal, recycling, food waste management, yard and wood waste management, bulk item pick-up and management, and construction and demolition (C&D) debris diversion and management. 45 SW Asset Management (45 CES/CEA) is the overall manager for this program.

The Leadership in Energy and Environmental Design (LEED) is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED certification may be required for new building construction.

3.6 Safety and Health

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health* program summarizes AF requirements for the protection of safety and health. The Occupational Safety and Health Administration (OSHA) sets and enforces standards for safe and healthy working conditions and also provides training, outreach, education and assistance. AFI 91-202, *The US Air Force Mishap Prevention Program* summarizes AF requirements to develop and implement plans and procedures to prevent and reduce mishaps. Common safety hazards associated with heavy equipment operation and construction activities would exist in addition to precautions necessary for workers. The discussion of human safety and health in this document includes both workers and the general public as related to the Proposed Action. Safety issues include exposure to hazardous materials or toxic concentrations, radiant heat, accidental releases or explosions (such as flying debris), working in confined spaces or at height, and working with dangerous equipment or within potentially hazardous conditions. Health issues result from activities where people may be impacted over a long period of time rather than immediately, such as with noise. Table 3-7 identifies other specific guidance for maintaining health and safety standards during the implementation of the Proposed Action.

Table 3-7: Summary of Safety and Health Requirements

Law or Rule	Permit/ Action(s)	Requirement	Agency or Organization
Occupational Safety and Health Standards, 29 CFR 1910 Safety and Health Regulations for Construction, including Subpart T "Demolition", 29 CFR 1926	Various	Protect health and safety of workers	OSHA
Air Force Occupational Safety and Health Standard (AFOSH STD) 48-22, <i>Occupational Exposure to Hazardous Chemicals in Laboratories</i> AFOSH STD 48-8, <i>Controlling Exposure to Hazardous Materials</i> AFOSH STD-127-43, <i>Flammable and Combustible Liquids</i> AFOSH STD 91-68, <i>Chemical Safety</i> AFOSH STD 91-119, <i>Management of Highly Hazardous Chemicals</i> AFOSH STD 91-31, <i>Personal Protective Equipment</i> AFOSH STD 48-21, <i>Hazard Communication</i>	Various	Protection from Exposure to Hazardous Materials	USAF
45 SW OPLAN 91-212, <i>Bird Hazard Reduction Plan</i>	Prevent and deter bird attractants near/on the airfield	Protect aircrew/aircraft from Bird Aircraft Strike Hazards (BASH)	USAF, 45 SW

Construction

The Uniform Fire and Building Codes apply to the storage, dispensing, use, and handling of hazardous materials. These codes regulate the treatment systems for accidental release and continuous monitoring of toxic and highly toxic compressed gases above exempt amounts. The regulations require detailed information regarding spill control drainage, containment, ventilation, emergency power, special controls for hazardous gases, fire prevention, and building height. Any new facility must have precautions against fire, open flames or burning, fire protection systems, emergency planning, operation and maintenance of equipment, processes and occupancies, and materials handling. Some of these requirements may be met by using control devices that also reduce air emissions.

Noise

Noise is unwanted sound that interferes with normal activities or otherwise diminishes the

quality of the environment; it may be intermittent or continuous, steady or impulsive. Noise may also involve a broad range of sound sources and frequencies and be generally nondescript, or it can have a specific, readily identifiable sound source. The decibel (dB) is the accepted standard unit for measuring the level of noise and is generally adjusted to the "A-weighted" logarithmic scale (dBA) to better correspond to the normal human response to different frequencies. The day-night sound level (Ldn) is defined as the equivalent A-weighted sound level during a 24-hour time period with a 10 decibel weighting applied to the equivalent sound level during the nighttime hours of 10 p.m. to 7 a.m. (EPA "Levels Document" 1974). FICON (1992) recommends Ldn as the principal means for describing long-term noise exposure for civil and military aircraft operations. Land-Use compatibility recommendations are provided for local governments as well as DoD personnel for on-base planning in DoDI 4165.57.

BASH

OPLAN 91-212, *Bird Hazard Reduction Plan*, requires a course of action for reduction of bird attractants to the airfield area and active harassment protocol to prevent habituation by birds. Maintenance of the airfield area includes techniques to deter bird nesting such as cutting grass regularly, removal and trimming of vegetation within specific height criteria depending on its proximity to active runways, dredging of canals, and removal of roosting/perching platforms in the airfield zone.

Asbestos

Asbestos Containing Material (ACM) may be present in buildings proposed for demolition or renovation. Asbestos is a regulated substance because it is a carcinogen and a cause of asbestosis (a lung disease). Asbestos is a designated hazardous air pollutant under the NESHAPs of the Clean Air Act. The EPA issues regulations to ensure compliance with the Act. The OSHA also provides for worker protection for employees who work around or remediate ACM. Friable ACM, which can be pre-existing or generated during a demolition activity, refers to any material containing more than one percent asbestos that can be crumbled, pulverized, or reduced to powder when dry, by using hand pressure or similar mechanical pressure. When asbestos poses a health danger from the release of airborne fibers (because it is in a friable state), Air Force policy (AFI 32-1052, *Facility Asbestos Management*) is to remove or isolate it. After demolition, all friable asbestos must be encapsulated or removed, the site must be approved, and the asbestos waste disposed of in an approved landfill. Refer to Table 3-6 below for ACM non-destructive survey results for facilities proposed for demolition or renovation in the next five years.

Heavy Metal Based Paints

The toxic effects of lead on human beings have been known for many years. Chronic overexposure to lead in adults may result in severe damage to the blood-forming organs and the nervous, urinary, and reproductive systems. Childhood lead poisoning is one of the most common and preventable pediatric health problems in the United States today. Children are particularly susceptible to lead's toxic effects. Regulatory efforts to reduce use of lead-based paints began in 1971. In 1978, the Consumer Product Safety Commission banned the use of paint containing more than 0.06% lead by weight on interior and exterior residential surfaces, toys, and furniture. The Department of Defense developed policies to enforce the lead-based paint rule. Lead-based paint in good condition does not pose a health hazard. When lead-

based paint is in a deteriorated (cracking, peeling, chipping) condition, or damaged by renovation or maintenance activities, it can release lead-containing particles that pose a threat of lead contamination over extended periods of time to the environment and a health hazard to workers and building occupants. Emphasis is placed on personnel awareness and training in procedures to prevent damage to heavy metal-based paints and to properly deal with it in both planned and unplanned circumstances. At PAFB paint removal and disposal of hazardous paint debris is in accordance with 45 SW Management Plan 19-14 and the Resource Conservation and Recovery Act (RCRA). Special considerations for heavy metal paint abatement will be given to facilities proposed for use by children. Refer to Table 3-8 below concerning facilities proposed for demolition or renovation in the next five years that are presumed to have heavy-metal based paint coatings as the age of the facilities are earlier than 1978.

Table 3-8: Asbestos & Lead-Based Paint in Facilities Proposed for Demolition or Renovation

*proposed for demolition; UNK=Unknown; TBD= to be determined

Facility	Constructed	Size (SF)	Asbestos/ Lead-Based Paint (Yes, No or UNK)
313	1943	TBD- renovation	Yes/Yes
407*	1945	224	Yes/Yes
408*	1955	6,880	No/Yes
410*	1943	200,000 gal water tank tower	UNK/Yes
423	1959	TBD- renovation	Yes/Yes
425	1957	TBD- renovation	Yes/Yes
515*	1943	3,393	Yes/Yes
522*	1944	5,304	No/Yes
523*	1942	12,657	No/Yes
524*	1941	1,173	No/Yes
533*	1959	6,850	Yes/Yes
534	1942	TBD- renovation	Yes/Yes
557*	1945	14,336	No/Yes
559*	1944	15,390	Yes/Yes
560*	1945	14,368	UNK/Yes
561	1945	TBD- renovation	Yes/Yes
673	1958	TBD- renovation	No/Yes
722	1943	TBD- renovation	Yes/Yes
739*	1963	1,095	Yes/Yes
912*	1975	2,040	No/No
938*	1975	4,080	No/No
945	1957	TBD- renovation	Yes/Yes

Facility	Constructed	Size (SF)	Asbestos/ Lead-Based Paint (Yes, No or UNK)
948*	1958	400,000 gal water tank tower	UNK/Yes
960*	1974	4,080	No/UNK
980*	1992	4,400	No/No
986	1953	TBD- renovation	Yes/Yes
996	1954	TBD- renovation	No/Yes

3.7 Infrastructure and Transportation

Infrastructure and transportation includes utilities, solid waste management, transportation networks, fire protection, storage tanks and other amenities. An approved Air Force Form 103 (Work Clearance) is required prior to initiation of any site work/excavation. Refer to Table 3-9 for a requirements summary. Refer to the subsequent paragraphs for specific details concerning PAFB infrastructure aspects and requirements.

Table 3-9: Summary of Infrastructure and Transportation Requirements

Permit/Action(s)	Requirement	Agency or Organization
Solid Waste Compliance	AFI 32-7042	45 Asset Management/Environmental
AF Form 103 approval Utility Locate/Excavation Permit	Any excavation activity	45 SW Civil Engineering Squadron
State and County Transportation Coordination (FDOT)	Any change to access points to major State Roads (A1A); Any change to traffic patterns or signals	Florida Department of Transportation Brevard County Traffic Engineering

3.7.1 Drinking Water System

The City of Cocoa is contracted to supply up to 6,500,000 gallons per day to PAFB. The city's water is delivered through a 16-inch water main where it is further chlorinated and distributed throughout the base through two 12-inch metered service mains. Minimum potable water usage at PAFB is approximately 1,000,000 gal/day, occurring in the winter months. Maximum usage at PAFB is about 3,650,000 gal/day, occurring during the summer months.

In addition to the water supplied by the City of Cocoa, the City of Melbourne agrees to furnish 1,000,000 gallons of water per day (GPD), as needed. PAFB will reciprocally provide the City of Melbourne with 1,000,000 GPD, as needed and as available. PAFB is tied into three separate City of Melbourne water mains. Another source of water, although non-potable, is a deep-well system, which draws from the Florida Aquifer system. The water from the wells is corrosive in nature and has an excessive amount of chlorides and total dissolved solids, which exceed the Florida Water Drinking Standards. Well water is used only in commercial and some common

areas where feasible. The capacity of active wells is approximately 760 million gallons per year. The City of Cocoa also provides reclaimed water for irrigation.

The water distribution system is composed of approximately 65 miles of underground potable mains and 87 miles of underground non-potable mains. One potable water pump station in the north Base provides pressure. Elevated tanks provide 1,350,000 gallons of emergency water. The supply of domestic water from the City of Cocoa is more than adequate, at present. If more water is needed, arrangements with the City of Cocoa could be effected. If required, the City of Melbourne could also provide water.

The majority of the potable water mains were installed and upgraded at various times between 1952 and 1958; exceptions are all new mains in the Central and North Housing Areas. The water pump stations are 40 years old, on average. Much of the newer piping is PVC, but some asbestos cement pipe or ductile-iron pipes remain (both are usually unaffected by corrosive soil conditions). Although the water mains are in relatively good condition, the 2-inch galvanized steel pipe, used as water service lines, is deteriorating because of corrosion. Considering the water distribution and pump system's age, a phased repair and replacement project is recommended. Therefore, a phased base-wide replacement of the water distribution system is planned as an out year project.

3.7.2 Sanitary Sewer System

The City of Cocoa Beach treats wastewater generated at PAFB. The base's wastewater is conveyed to the City of Cocoa Beach for treatment via lift station Facility 650 through approximately 47 miles of underground sanitary sewer lines to the wastewater treatment plant of the City of Cocoa Beach, six miles away. The Water Reclamation Department of Cocoa Beach, in turn, provides treated wastewater to PAFB via a Reuse Water System for irrigation purposes. The City constructed a 16-inch reuse water supply line to the north end of PAFB. From there, a 14-inch reuse main runs along the west side of the Base to the PAFB Golf Course primary irrigation pond and furnishes irrigation water for the Golf Course and landscaped areas for the Base Exchange and the Medical Clinic. Projected availability of reuse water is a maximum of 500,000 GPD with an option to supplement reuse water with ground water.

The majority of the sanitary sewer lines are gravity lines, although force mains exist in some areas. The vitrified clay and PVC gravity sewer lines are reported to be in fair condition. The force mains are steel and PVC, and are reported to be in good condition. Service connections of cast iron material are showing degrees of deterioration from internal corrosion.

Wastewater generated on base includes domestic wastewater, and small quantities of typically deposited industrial waste, e.g. solvent mixtures. By contract with the City of Cocoa Beach, the City has reserved a treatment capability of 2.0 million gallons per day (MGD) for PAFB. The contract will be annually reviewed for reserved peak flow adjustment, as necessary. Using the present reserved flow capacity of 2.0 million gallons per day (MGD) and average daily flow of 380,000 GPD is a residual capacity of 0.820 MGD (1.2 MGD capacity - 380,000 GPD use). Allowing 100 gallons per capita per day (gpcd), equates to an expansion capability of 8,200 persons. However, this calculation does not consider treatment of industrial waste or the potential for inflow and infiltration, which could be high during wet weather periods.

3.7.3 Storm Water Drainage System

The storm water system at PAFB is composed of an "open" and "closed" system of collection, and is separate from the flow of wastewater in the sanitary sewer system. The open drainage system conveys storm runoff by overland flow (drainage ditches), gutters, channels, and swales, to a point of discharge (Banana River) or detention (ponds, canals, swales) which provides for some treatment through percolation before discharge. As part of the normal maintenance routine at PAFB, canals and drainage ditches must be dredged and mowed to prevent the overgrowth of plants and trees. Furthermore, uncontrolled vegetative growth within and near stormwater systems degrades treatment capacity and can provide potential habitat for birds at PAFB, which could cause Bird/Aircraft Strike Hazard (BASH) problems around the airfield.

The stormwater system, installed in 1949, consists of a network of catch basins, pipes (about 17.5 miles) and underground piped connections beneath the drainage areas. The oldest stormwater system discharges to either the Banana River or the Atlantic Ocean. Newer stormwater systems are developed with wet or dry detention/retention swales that allows runoff to collect and percolate into PAFB's sandy soils. Storm water discharges for PAFB are addressed under the General Permit for Multi-Sector Storm Water Discharge Associated with Industrial Activities regulated by USEPA. PAFB regulates the storm water run-off under its Storm Water Pollution Prevention Plan (SWPPP).

A Notice of Intent for Storm Water Discharges Associated with Construction Activity under a National Pollutant Discharge Elimination System (NPDES) General Permit must be submitted to FDEP prior to the commencement of any construction activities, through the 45 SW Asset Management/45 CES Environmental (45 CES/CEA). When all construction activities have been completed, a Notice of Termination must be submitted to FDEP through 45 CES/CEA. In addition to NPDES permits, Section 438 of the *Energy Independence Security Act* requires that post-development hydrologic stormwater discharge for activities affecting greater than 5,000 sq ft meet pre-development discharge (no net increase in discharge). The 45 SW has also been working with Brevard County, FDEP, and SJRWMD to develop regional approaches for Total Maximum Daily Load (TMDL) implementation. Projects are included in the next few years to consolidate Environmental Resource Permits into single regional permits for various areas on base to better manage stormwater and base discharges. Additionally, low impact development processes are considered to minimize impacts of stormwater discharge and reduce TMDLs to the Banana River, stormwater receiving waters for PAFB.

PAFB has a Municipal Separate Storm Sewer System (MS4) Permit in which best management practices are to be implemented during repair, construction, or maintenance activities to meet the permit requirements and minimize impacts of stormwater discharge.

3.7.4 Electric System

Electrical service for PAFB is supplied by Florida Power & Light (FPL) through transmission line connections to a North Substation and a South Substation, both controlled by FPL. The substations convert the incoming electricity, and then route the power to government-owned switchgears located adjacent to the substations. Electricity is then distributed throughout the base via feeder lines from the substations. At current load-levels, either substation can supply all loads when the feeders are tied. Of the primary and secondary electrical distribution lines,

approximately two percent are overhead, and the remainder is underground. The overhead distribution system, which includes poles, transformers, and hardware are adversely impacted by salt air contamination, high winds, bird interference, and lightning strikes.

A centralized, electrical back-up generation system can provide continuous power to all non-housing loads in the event all commercial power is lost. Several facilities requiring back-up power are also independently supported with back-up diesel powered generators such as communication centers, the Command Post, AFTAC, and lift stations. There are no electrical power constraints for PAFB and its future growth.

3.7.5 Natural Gas System

Natural gas is provided in a distribution piping system from the north and the south. Average usage at PAFB is approximately 25,000 Million British Thermal Units (MBTU). Approximately 0.6 miles of gas lines, installed in 1999, and owned and maintained by PAFB, distribute low-pressure gas to various places on base. There is no limit on gas supply for future use and expansion.

3.7.6 Liquid Fuel System

The liquid fuel system includes all fuel delivery, storage, and distribution facilities. All in-use tanks comply with current regulatory requirements. Availability of fuel has not been a constraint. Supplies are arranged through the Defense Logistics Agency (DLA), and are delivered exclusively by tanker truck. The existing 1940s era concrete fuel storage tanks are considered "cut and cover," and are not subject to corrosion deterioration, however there have been issues with increased frequency of maintenance that has prompted the replacement of these tanks with new, more efficient aboveground storage tanks (planned for FY 2016). Additionally, there are over 35 liquid fuel tanks of various sizes that contain diesel, jet fuel, gasoline, and heating oil. Fuel storage tanks are inspected regularly, corrosion-control is performed as needed, and they are replaced as necessary.

3.7.7 Communications

Communications infrastructure at PAFB provide support for spacecraft processing, launch and tracking facilities, safety procedures, and test data to a variety of customers to manage launch operations for the Department of Defense space programs. There are varying configurations of radar, telemetry, optics, command, data processing, timing, communications, meteorology, and other activities at each site. An extensive communications network consists of communication satellites, microwave links, high frequency (HF), very high frequency (VHF), and ultra high frequency (UHF) radio systems, and various landline links. Communication networks are being upgraded regularly, and new construction with communication inclusion also requires communication upgrades for efficient tie-ins/connections to existing systems.

3.7.8 Transportation

Vehicle access to and egress from PAFB is provided by SR A1A to the east and SR 404 (Pineda Causeway) to the south via South Patrick Drive. These roadway systems are adequate for PAFB use and future development discussed in the Proposed Action. The general public

also uses these roadways, and they are maintained by local, state and federal government funds through local and state agencies.

Patrick AFB has three security checkpoints (gates) for vehicle and pedestrian access. The Main Gate on Jupiter Street and SR A1A provides for those cars/pedestrians entering and exiting the Base to the north. The South Gate on South Patrick Drive and SR 404 provides for those cars/pedestrians entering and exiting the Base from the west and south. The third checkpoint is the Truck Inspection Gate which is located at mid-Base from SR A1A. This separate location eliminates truck access/egress from the north and south gates that aren't compatible with truck turning radii as well as allows for additional anti-terrorism/force protection requirements for trucks that incorporates more extensive explosive detection.

During peak vehicular traffic periods, typically in the morning hours, congestion occurs at the South Gate and sometimes occurs at the Main Gate. At the Truck Gate, congestion can also occur in the morning hours due to deliveries to the South Base Community Support facilities, forming a long queue on SR A1A. Re-configuration of the all three of the gates would reduce congestion issues. Projects are planned for all of the gates; the Main Gate and Truck Inspection gate work will be analyzed in a separate Environmental Assessment.

Within the Base, the roadway network is made up of arterial, collectors, and local roads. There is only one arterial on PAFB. This arterial carries the majority of the north-south traffic and connects most areas of the Installation. Collector roads on PAFB provide north-south access in the Main Base area.

3.8 Air Installation Compatible Use Zone (AICUZ) and Land Use

Air Force Air Installation Compatible Use Zones (AICUZ) guidelines are based on operational factors that aim to influence the use of land near airfields by informing and working with local governments on the dangers and annoyances related to military airfields. These include height restrictions, noise contours and aircraft accident potential zones (APZ). The AICUZ program includes land use compatibility guidelines based on these factors, which are defined in order to minimize the exposure of the public to noise and safety hazards, provide safer aircraft operations and help protect the airfield from encroachment by incompatible land development. Air Force guidance on the AICUZ program is found in Air Force Instruction (AFI) 32-7063, *Air Installation Compatible Use Zone Program*. The airfield APZ does cross over parts of the PAFB Beach and into the Atlantic Ocean as well as the Banana River. All equipment use within the APZ must be coordinated with 45 SW Airfield Operations so notices can be made to pilots to prevent/reduce accident risk.

Unified Facilities Criteria 3-260-01, Airfield and Heliport Planning and Design, limits location and heights of objects around the airfield to minimize hazards to airfield operations. Certain obstructions are permitted, if necessary to airfield operations. Others are allowed as pre-existing non-conforming features. Waivers may be granted by the Major Command (MAJCOM); the AFSPC for the 45 SW. Current building height restrictions allow one foot of building height for every 50 feet the facility is located from the runway (50:1 ratio).

The Clear Zones for Runway 02/20 are 3,000 by 3,000 feet at each end. For Runway 11/29 they are 1,000 feet wide and 3,000 feet long. These areas must generally be kept free of

aboveground structures. However, many buildings in ADP II and III are within the Clear Zone for Runway 02/20. Conceptual designs contained in the ADPs identify locations to move several facilities out of the Clear Zone. It will not be economically feasible to remove all facilities immediately because of the high expense of new construction and the need to develop effective consolidation efforts.

Table 3-10 summarizes airfield clearance criteria. On-base areas of concern are the Primary Surfaces, Transitional Surfaces, taxiways and aprons, and Clear Zones.

Table 3-10: Airfield Clearance Criteria

Imaginary Surfaces (Class B Runway)	Clearance Requirements
Primary	1,000 feet each side of the runway centerline
Transitional	From the outer edge of the Primary Surface - a 7:1 slope ratio to an elevation of 150 feet
Taxiway	200 feet from the taxiway centerline
Wingtip Clearance (Primary Peripheral Taxi lanes)	One half of the aircraft wingspan plus 30 feet (for aircraft with wingspans up 110 feet) or plus 50 feet (for aircraft with wingspans over 110 feet)
Clear Zone (CZ)	3,000 x 3,000 feet, centered on and extending from the end of the runway
Accident Potential Zone I (APZ I)	3,000 x 5,000 feet, extending from the CZ*
Accident Potential Zone II (APZ II)	3,000 x 7,000 feet, extending from APZ I*

Note:

* DOD Instruction 4165.57, Air Installation Compatible Use Zones (AICUZ)

Source: UFC 3-260-01, Airfield and Heliport Planning Criteria

The PAFB General Plan long-term planning goal is to remove facilities and obstructions out of the PAFB Airfield Clear Zone and eliminate hazards in the APZ to align more closely with planning and AICUZ objectives. Buildings near the airfield should be situated far enough away such that occupants are not subjected to excessive or hazardous noise levels. Also, as neighboring communities prepare and revise their land use development plans, recommendations from the latest PAFB AICUZ study should be considered to help avert off-base land use incompatibilities that may compromise an installation's ability to accomplish its mission.

A primary goal of effective land use planning is to create an environment for people to work, play, and live that is functional, efficient, and pleasant. Throughout the PAFB General Plan

process, evaluations are accomplished of existing land use and transportation systems, using site and facility planning to produce an arrangement of compatible and functional activities that address future requirements. By using a collaborative process, land use planning results in a plan that provides a logical and realistic direction for future development on base. Approximately 2,002 acres of real estate comprise PAFB of which land use at PAFB is dominated by the 728 acre airfield area, and another 82 acres of surface water (retention ponds and canals). Table 3-11 on the following page summarizes the existing land use acreages at PAFB.

At PAFB, land use planning is constrained by a number of factors, including historic development patterns, land configurations, systems technology and Air Force Headquarters strategy. The array of land uses and the locations of buildings, roads and utilities have changed over time, as missions and needs have evolved. The placement of activities has also responded to the physical and natural environments that existed when each use was developed. Therefore, planning for the location of infrastructure, the proximity of functionally related activities, and the specific needs of installation personnel has been a challenging process of overcoming land use obstacles at PAFB. For example, several types of land uses currently occur within the Airfield Clear Zones, including Industrial, Administrative, Community Services, Commercial, and Outdoor Recreation facilities.

Table 3-11: PAFB Existing Land Use

Land Use	Acres
Administrative	75
Aircraft Operations/Maintenance	34
Airfield Area	728
Community Commercial	73
Community Service	12
Housing Accompanied (Privatized)	153
Housing Unaccompanied (some Privatized)	23
Industrial	217
Launch and Range Control	2
Medical	22
Open Space (Beach, River Shore, Undeveloped)	329
Outdoor Recreation (Golf Course, Beach Parking Area, Pavilions, Fields, Family Camping)	252
Water	82
TOTAL:	2,002

Patrick AFB is located along the Atlantic Ocean coastline. In recognition of the increasing

pressures of over-development upon the nation's coastal resources, Congress enacted the Coastal Zone Management Act (CZMA) in 1972. The CZMA encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats. The Secretary of Commerce delegated the administration of the CZMA to the National Oceanic and Atmospheric Administration (NOAA). The Office of Ocean and Coastal Resource Management administers individual state programs.

The CZMA contains environmental compliance implications for many federal projects and programs "directly affecting" the states' coastal zones. Federal property is exempt from the definition of the states' coastal zones, but activities occurring on federal property that directly affect the states' coastal zones will comply with the CZMA. The section of the Act most significant to the Proposed Action is Section 307, "Coordination and Cooperation." Section 307(c)(1)(A) mandates that each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs.

A list of applicable regulations for land use and zoning requirements can be found in Table 3-12 on the following page.

Table 3-12: Summary of Land Use and Zoning Requirements

Law or Rule	Permit/Action(s)	Requirement	Agency or Organization
Coastal Zone Management Act	Development projects will be consistent to the maximum extent practicable with Florida's Coastal Zone Management Program	Preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as floodplains, and dunes	FDEP, Air Force
Florida Statutes, Section 373.428	Federal Consistency	When an activity regulated under this part is subject to federal consistency review under Section 380.23, the final agency action on a permit application submitted under this part shall constitute the state's determination as to whether the activity is consistent with the federally approved Florida Coastal Management Program. Agencies with authority to review and comment on such activity pursuant to the Florida Coastal Management Program shall review such activity for consistency with only those statutes and rules incorporated into the Florida Coastal Management Program and implemented by that agency. An agency which submits a determination of inconsistency to the permitting agency shall be an indispensable party to any administrative or judicial proceeding in which such determination is an issue; shall be responsible for defending its determination in such proceedings; and shall be liable for any damages, costs, and attorneys' fees should any be awarded in an appropriate action as a consequence of such determination.	NOAA
Florida Statutes, Section 380.23	Federal Consistency	(1) When a federally licensed or permitted activity subject to federal consistency review requires a state license, the issuance or renewal of a state license shall automatically constitute the state's concurrence that the licensed activity or use, as licensed, is consistent with the federally approved program. When a federally licensed or permitted activity subject to federal consistency review requires a state license, the denial of a state license shall automatically constitute the state's finding that the proposed activity or use is not consistent with the state's federally approved program, unless the U.S. Secretary of Commerce determines that such activity or use is in the national interest as provided in the Coastal Zone Management Act.	NOAA
Florida Administrative Code 62B-33.004 (3) (b)	Exemptions from Permit Requirements.	(3) In addition to the exemptions provided in Section 161.053(12), F.S., the following are exempt from the provisions of Section 161.053, F.S., and this rule chapter: (b) Construction, excavation, and damage or destruction of vegetation conducted by the United States Government on lands owned and maintained by the United States Government.	FDEP

3.9 Water Resources

The FDEP East Coast Florida Aquatic Preserves Office is responsible for the Indian River Lagoon (Malabar to Vero Beach), Banana River and Mosquito Lagoon. The Banana River is part of the Indian River Lagoon complex (IRL), 156-mile long estuary that spans from Ponce de Leon inlet in the north to Jupiter Inlet in the south. The entire Indian River Lagoon System has been designated as an "Estuary of National Significance" under the National Estuary Program, of which PAFB is currently participating as the Banana River is its western property boundary. The FDEP also classifies the Banana River in the vicinity of PAFB as Class III waters, which provides for protection of the waterways for recreation, propagation and maintenance of healthy fish and wildlife populations.

The Banana River is a brackish waterway with an average depth of 5-feet. The width of the river varies from 600 to 15,000 feet. Water exchanges with the Atlantic Ocean is very restricted, and no significant freshwater inflow occurs; thus the Banana River is classified as a lagoon. Circulation is not significant within the Banana River Lagoon System. Currents are largely wind-generated, as well as a function of freshwater inflow. Tidal fluctuations in the northern section of both the Banana and Indian River lagoon systems near PAFB are not significant due to the distances to the nearest ocean inlets. Historically, sewage effluents, agricultural and urban runoff, and restriction of natural circulation and flushing by the presence of causeways are the major causes of water quality degradation within the Banana River. Studies have indicated that phosphorus and nitrogen loading show strong correlations with seagrass mortality. Several segments of the Indian River and Banana River Lagoons are listed as impaired due to elevated nutrients. Water quality degradation monitoring has prompted more stringent regulations in relation to Total Maximum Daily Loads (TMDLs) and nutrient loading restrictions/caps allotted to property owners for allowable discharges to the Banana River. Calculations for nutrient reduction requirements per segment in the Banana River are currently being assessed by FDEP through Basin Management Action Plans.

The property boundary to the east of PAFB is the Atlantic Ocean. The Banana River and the Atlantic Ocean are two major surface water resources used by PAFB. In addition, water resources directly within PAFB include 87 acres of surface waters with over 4 miles of upland cut drainage ditches, stormwater and irrigation/reuse water retention ponds. Most of the drainage ditches contain water throughout the year because they intersect the shallow water table aquifer. A few canals are connected with the Banana River and are slightly brackish.

PAFB is underlain by both confined and unconfined aquifers. The hydrologic units (aquifers) underlying PAFB include the surficial water table aquifer; semi-artesian and artesian aquifers within the Caloosahatchee Marl, Tamiami Limestone, and Hawthorn Group; and the artesian Floridian aquifer. The surficial water table aquifer underlying PAFB is the major hydrostratigraphic system that can be influenced by base operations. This system, consisting primarily of marine sands, shell fragments, and coquina limestone, extends approximately 50 feet bls. The water table is generally within five feet of the ground surface. The generalized direction of groundwater flow in the surficial aquifer is westward, toward the Banana River. Localized flow in the surficial aquifer is from topographic highs (mounds, swells, dune ridges) toward surface water bodies (creeks, ponds, drainage canals).

AFI 32-7041, *Water Quality Compliance*, identifies essential USAF actions to achieve and

maintain compliance with the Clean Water Act, and other applicable Federal, State, and local water quality standards. It requires adherence to applicable State and local water quality standards when they are more stringent than Federal standards. Permitting through the USACE is required where waters regulated under Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403) will be affected, specifically through dredge and fill activities. Dredge and fill permits under Section 404 require minimization of turbidity during operations and monitoring for turbidity after operations with removal of curtains/blankets/booms after there are no turbidity conditions. A National Pollutant Discharge Elimination System (NPDES) Permit must be obtained if one acre or greater is disturbed with a Notice of Intent for Storm Water Discharges prior to associated construction activity and a Notice of Termination when all construction activities have been completed.

3.10 Socioeconomics

The economic impact region for PAFB is the geographical area encompassing the area within a 50-mile radius of PAFB that may be subject to significant Installation generated economic impacts. This area includes portions of eight different counties: Brevard, Indian River, Okeechobee, Orange, Osceola, Seminole, St. Lucie and Volusia. The region stretches northward to New Smyrna Beach, southward to Fort Pierce, and westward to Orlando.

The 45 SW (which includes PAFB and CCAFS) is the top employer in Brevard County, with an estimated 15,000 personnel (including military, civilian, and contract employees). Other major employers are concentrated in four areas:

- Kennedy Space Center (KSC)
- Melbourne
- Palm Bay
- South Titusville region

The presence of the DoD and several high tech and aerospace employers provides a predominant economic force in the area, with an economic value of \$1.1 billion impact during FY 2007 (PAFB General Plan 2011). In addition, PAFB supports over 12,650 DoD retirees within Brevard County, who bring in more than \$292 million per year in retirement income. Thus, the 45 SW and its tenant units are a major source of employment and revenue for thousands of Brevard County residents.

Under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, Federal agencies must analyze environmental effects such as human health, economic and social effects on low-income and minority populations, and mitigate significant effects to these communities. The Proposed Action area is not located adjacent to minority populations or low-income population centers.

4.0 ENVIRONMENTAL CONSEQUENCES

This section describes the potential environmental impacts associated with the activities under the Proposed Action, Alternatives to the Proposed Action, and the No Action Alternative. Components of the affected environment that have greater potential for impacts are described in greater detail in this section, and organized by aspects in the same order as in Section 3.0. This section concludes with an evaluation of relationships between short-term uses and long-term productivity, cumulative impacts, and irreversible and irretrievable commitments of resources.

Federal, State, and local environmental laws and regulations were reviewed to assist in determining established thresholds for assessing environmental impacts (if any) in fulfillment of NEPA requirements. Proposed activities were evaluated to determine their potential to result in significant environmental consequences using an approach based on the interpretation of significance outlined in the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1500-1508) and 32 CFR 989, *The Environmental Impact Analysis Process* (USAF 2003).

Guidelines established by the CEQ (40 CFR 1508.27) specify that significance should be determined in relationship to both context (spatial and temporal) and intensity (severity). As discussed in Section 2.0, the three levels of impact are identified as no impact, not significant, and significant. Severity of an impact may be based on the magnitude or likelihood of change, the ability of the resource to bounce back after impact, and the potential for violation of laws or regulations. Significant impacts should receive the greatest attention in decision-making, and impacts that have little or no effect should not be considered significant.

4.1 Air Quality

Air emissions for the Proposed Action were evaluated in accordance with Federal, State, and local air pollution standards and regulations. Because PAFB is in an attainment area, a conformity analysis is not required. However, PAFB's Title V Air Permit applies, and fugitive dust estimates and air construction permits would be required as necessary. Other potential environmental consequences to air quality are provided below, and are applicable to any facility or activity associated with the PAFB General Plan within the next five years.

4.1.1 Potential Impacts of the Proposed Action

For any new stationary sources of air contaminants, modifications that may occur as part of General Plan proposed projects will need to be evaluated to determine compliance with federal and state air quality regulations. New stationary sources have not been specifically identified in the Proposed Action, however changes to existing sources are proposed such as replacement of the remaining diesel fired boilers with natural gas fired boilers which will make all these sources change from regulated to insignificant for Title V permitting. It is assumed that with consolidation of shops, that existing equipment (creating air emissions) will be relocated to the new area. If new equipment is purchased, especially for new paint booths, then modifications to the Title V permit will be required to address any emission

changes such as with VOCs or HAPs. There are 19 fuel tanks that have throughput limits noted on the PAFB Title V Air Permit with fueling operations and breathing losses, and the only changes to existing tanks that are proposed are conversion of “cut and cover” tanks to aboveground tanks in FY2016. This switch to these new tanks with double-walled secondary containment, more security features to prevent leaks/spills, and reduced breathing losses should reduce emissions related to fuel storage tanks at PAFB. Most activities and equipment at PAFB are considered insignificant sources of air emissions and preventative actions are taken to limit emissions, such as filtering devices and dust suppression, however emissions should be estimated to ensure that Prevention of Significant Deterioration (PSD) requirements are not being triggered. PSD applies to new major sources or major modifications at existing sources in attainment with the NAAQS. PAFB has not tripped any permitted thresholds for HAPs or criteria air pollutants, however calculations related to construction emissions should be considered to verify that PSD requirements won't be required.

Prior to the construction or installation of any facility that may reasonably be a source of air pollution, PAFB must apply for and receive an air construction permit unless the proposed or modified equipment is exempt from permitting. Upon receipt of an air construction permit, PAFB may be required to update the Title V Air Permit to include the new sources of air emissions. The proposed new Fire/Crash Rescue Station and Training Facility (ADP V) may require an air construction permit should any training aspects include stationary sources of emissions. Additionally the proposed Vehicle Maintenance Complex and Civil Engineering Shops Complex (ADP V) may require air construction permits if boilers, paint booths/coatings application devices (VOC emissions), large fuel burning devices, large fuel storage tanks, intense woodworking and sanding operations, or hazardous waste storage facilities, etc., are to be included in shops planned for construction. The beach equipment and snack bar proposed in ADP I (Picnic Tables Beach) may require a permit if a kitchen with vented hood is considered instead of the sale of pre-packaged foods. If during design reviews and projections for air pollutant emission inventories it is determined that emissions generated from proposed new operations will potentially be significant increases (that may be considered to have an adverse effect on air quality), then additional environmental impact analyses will be required to address these potential concerns. Based on regular review/renewal of PAFB's Title V Permit and project design review for new construction, only projected particulate matter (PM) emissions can be analyzed to make reasonable determinations that PSD won't be triggered as related to proposed construction activities.

Although considered insignificant and exempt from permit requirements, construction-related emissions are a result of fugitive dust (particulate matter [PM and PM₁₀]) and combustion of fuel from construction equipment. Proposed Action activities such as construction within Picnic Tables (ADP I), Beachhouse (ADP II), Main Gate (ADP II), Hangars (ADP V) and Pineda Beach (ADP VI) access areas, basic construction with dorm additions (ADP II), DEOMI expansion (ADP II), FamCamp expansion (ADP IV), 1060 addition (ADP V), Department of State warehouse (ADP V), 1360 addition (ADP VI), and golf course and marina clubhouse expansions (ADP VI) as well as demolition identified in proposed actions in ADP II, III, V,VI, the airfield, and former South Housing are considered insignificant emission sources. PAFB is designated as a major source of criteria air pollutants, and is permitted to emit PM in excess of 100 tpy. However, conditions of the Title V Permit require implementation of reasonable precautions to reduce PM emissions, and all

insignificant emissions will be reviewed to determine applicable integration into the permit. It is expected that fugitive dust from ground-disturbing activities can be reduced by application of Best Available Control Technologies (BACT) such as application of water sprays, dust suppressants, use of coverings or enclosures, paving, enshrouding, and planting. Volatile organic compounds (VOC), carbon monoxide (CO), oxides of nitrogen (NOx), and sulfur dioxide (SO₂) are also emitted from exhaust of the construction equipment and dust emissions from earth moving activities. Actual emissions of any criteria air pollutant must be below 250 tpy to prevent triggering of PSD requirements. A representative air emissions estimate was performed for the proposed PAFB Main Gate construction activities within approximately 13.5 acres of land. Tables 4-1 through 4-4 identify the assumptions, emission factors, and the resultant air emissions anticipated.

Table 4-1: Assumptions for Air Emissions Estimate

Construction Equipment			Work Schedule		Total hp-hrs
Type	Number	Rated HP	Hrs/day	Days**	
Diesel Dump Truck	3	175	8	132	554,400
Diesel Crane	1	175	8	132	184,800
Diesel Bull Dozer	2	150	8	132	316,800
Pavement Equipment/Truck*	2	100	8	100	160,000

*Tractors/loaders/backhoes

**Five months

Table 4-2: Air Emission Factors

Equipment	Emission Factors (g/hp-hr)				
	VOC	CO	NOx	PM ₁₀	SO ₂
Diesel Dump Truck	0.44	2.07	5.49	0.41	0.74
Diesel Crane	0.44	1.30	5.72	0.34	0.73
Diesel Bull Dozer	0.36	1.38	4.76	0.33	0.74
Pavement Equipment/Truck	1.85	8.21	7.22	1.37	0.95

Table 4-3: Construction Equipment Exhaust Emissions

Equipment	Emission (tons)***				
	VOC	CO	NOx	PM ₁₀	SO ₂
Diesel Dump Truck	0.269	1.265	3.354	0.251	0.452

Diesel Crane	0.090	0.265	1.165	0.069	0.149
Diesel Bull Dozer	0.126	0.482	1.662	0.115	0.258
Pavement Equipment/Truck	0.326	1.448	1.273	0.242	0.168
Total	0.811	3.460	7.454	0.677	1.027

***Include conversion factor of 1.102×10^{-6} tons/gram

Ground Disturbance Emissions

Construction involves 13.5 acres of land, 132 equivalent 8-hour days, and an emission factor of 80 pounds of particulate matter (PM) per acre of construction per day. PM_{10} is 0.45PM.

$$PM = (132 \text{ days})(13.5 \text{ acres})(80 \text{ lb/acre-day})(1 \text{ ton}/2000 \text{ lb}) = 71.280 \text{ tons}$$

$$PM_{10} = 0.45PM = (0.45)(71.280 \text{ tons}) = 32.076 \text{ tons}$$

Table 4-4: Total Emissions

	Emissions (tons)					
	VOC	CO	NOx	PM	PM_{10}	SO ₂
Equipment Exhaust	0.811	3.460	7.454	0.000	0.677	1.027
Ground Disturbance	0.000	0.000	0.000	71.280	32.076	0.000
Total (one major construction event in one year)	0.811	3.460	7.454	71.280	32.753	1.027
Total (two major construction events plus ten small construction/demolition projects in one year)*	2.189	9.34	20.126	192.56	86.652	2.772

*Emissions estimate based on 13.5 acres of disturbance for each construction event taking 132 days each and occurring within the same year. Per the proposed actions, most minor construction or demolition projects are occurring on one acre or less and take 10-120 days to complete, therefore would minimally add to the annual total estimate, for example, only 5 tpy would be added to PM total for a minor project that is on the higher end of acreage impacted and time to complete.

In review of the 2010 PAFB Air Emissions Inventory (AEI), Potential emission rates from the 2010 emission inventory indicated that PAFB was neither a major source of HAP nor the criteria air pollutants PM, PM_{10} , SO₂, CO, VOC, or NOx. All sources including permitted, insignificant/exempt and significant but unregulated (sources) were included in this inventory. Total HAP and individual HAP emissions in 2010 were below the 22 tons per

year (tpy) and 8 tpy synthetic minor threshold limits, respectively. Actual emissions (less than 80 tpy) for criteria air pollutants were also under the 100 tpy threshold, and potential emissions for each criteria air pollutant were under the threshold. PAFB's designation as a major source of criteria air pollutants permits emitting greater than 100 tpy of PM. However, emissions of PM should be below 250 tpy to prevent triggering of PSD requirements. In 2012, one large construction project and three small construction/demolition projects are projected (AFTAC, airfield pavement demolition, Picnic Tables expansion and Beachhouse club expansion). In 2013, two large construction and nine small construction/demolition projects are projected (AFTAC, Main Gate relocation, marina dock replacement, airfield paving and lighting upgrades, and demolition of 557, 407, 408, 739, 1322, 1327, and 1330). In 2014, two large construction and five small construction/demolition projects are projected (AFTAC, 920 RQW campus development, FamCamp expansion, Pineda Beach expansion, and demolition of 515, 523, and 524). In 2015, one large construction and six small construction/demolition projects are projected (AFTAC, beach rental/snack bar Picnic Tables, 1360 expansion, South Housing soccer field restrooms, and demolition of 1425, 1432, and 1435). In 2016, two large construction and six small construction/demolition projects are projected (Fire Crash Rescue Station, Consolidated Network Communications Control Center, 1060 expansion, Golf Course Clubhouse expansion, fuel tank replacement, and demolition of 1427, 1440 and 3650). Finally, in 2017, two large construction and ten small construction/demolition projects are projected (CE Complex, DEOMI expansion, Marina Clubhouse expansion, Department of State warehouse, demolition of 810, 533, 559, 560, 960, 912, 1968, and 980). In review of Tables 4.1 to 4.4, annual potential emissions related to construction and demolition using the proposed actions' projections of a maximum of two large construction projects and ten small construction/demolition projects fall below the 250 tpy threshold per any one of the criteria pollutants, and PSD requirements should not be triggered. Potential emissions from PAFB projects in combination with ambient concentrations are well within the National Air Quality Standards (NAAQS). No significant impacts to air quality are anticipated.

A significant impact would occur if any project in the PAFB General Plan violates the NAAQS; contributes substantially to an existing or projected air quality violation; conflicts with or obstructs implementation of the applicable air quality plan; exposes sensitive receptors to substantial pollutant concentrations; or creates objectionable odors/emissions causing a significant adverse effect to human health and welfare. There are no indications that the construction or proposed operations from PAFB General Plan Proposed Actions would result in any of these significant adverse effects, therefore, no significant impacts to air quality are anticipated. However, the current Title V Air Operating Permit may need to be amended should there be changes to stationary sources, new sources are added, or calculated emissions have the potential to trip permitted thresholds. If during design reviews and projections for air pollutant emission inventories it is determined that emissions generated from proposed new operations will potentially be significant increases (that may be considered to have an adverse effect on air quality), then additional environmental impact analyses will be required to address these potential concerns. The analyses in this EA will provide the preliminary assessment of air quality, but more in-depth analyses will be required once projects are in final design and prior to construction.

To further reduce potential air pollutants, a pre-demolition ACM survey must be completed and ACM must be abated before any buildings are demolished or renovated. Project

designs for demolition/renovation of facilities must fully address the requirements for asbestos (40 CFR 61 Subpart M), 62-257, Florida Administrative Code, and the 45 SW Management Plan 19-14. Asbestos is a designated hazardous air pollutant under the NESHAPs of the CAA. Additionally, new refrigerant units must use non-Class I Ozone Depleting Chemicals (ODCs) such as R22, R123, R134a, or ammonia as the refrigerant. New units utilizing R-11 or R-12 would not be purchased (Engineering Technical Letter 91-7, *CFC Limitation in HVAC Systems*). Any refrigerants encountered in facilities proposed for demolition would be recovered and recycled to prevent ODC release and air quality impacts.

Currently, there is the potential for relocation or purchase of new aboveground storage tanks for new facilities for backup generators. Information on the size and planned contents of any proposed aboveground and/or underground storage tanks will be submitted to the 45 Asset Management/45 CES Environmental (45 CES/CEAN) Storage Tank Manager. All regulated fuel storage tanks will be constructed in accordance with Florida Administrative Code (FAC) 62-761, and will be inspected and approved by FDEP before filling with fuel. Records on contents, either loaded into each tank or dispensed from each tank, will be kept by the Fuels Management and Bulk Storage Operations group in accordance with AFI 23-201 and AFI 23-110. This information, required for all tanks (including fuel, chemical storage, hazardous waste storage, and pressurized), is a requisite for calculating total air emissions from USAF storage tanks (i.e., "through put" and "loading or unloading" emissions). In addition, any tanks that are removed during demolition activities will adhere to FDEP regulations, and be coordinated with 45 CES/CEAN.

Emissions of greenhouse gases (GHG) due to the Proposed Action would consist of fossil fuel consumption for electricity generation, transportation, and commercial and industrial practices. Sequestering of GHG will be accomplished with planting of trees and shrubs after demolition and around new construction/facilities. Fossil fuel burning is still the greatest contributor of GHG emissions that will be produced with the Proposed Action and will represent incremental additions to the global atmosphere. However, as noted in the tables presented in the preceding pages GHG emissions will be negligible and in compliance with thresholds established in the Title V Permit. No significant impacts to air quality due to activities at PAFB over the next five years are anticipated.

4.1.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. This alternative would provide for operational support of PAFB, but not at the efficiencies projected to be available from the Proposed Action. Small-scale repair will result in small amounts of air emissions that do not trip any thresholds as noted with emission estimate calculations. Emissions, for any one of the criteria pollutants for maintenance and repair work under the no action alternatives, are approximated to be less than 5% of those calculated for one large construction project (see Table 4.4).

In ADP I, only repair of existing beach amenities would occur which would result in minor emissions. In ADP II, facilities 407, 408 and 410, the dorms, DEOMI, and beach amenities would be maintained resulting in minor emissions. In ADP III, facilities 515, 522, 523, 524,

533, 557, 559, 560, 739 and 920 RQW stormwater systems would be maintained resulting in minor emissions. In ADP IV, repairs to FamCamp amenities would occur resulting in minor emissions. In ADP V, repairs to beach amenities, the fire station (810), 912, 938, 960, 980, 1968, inert munitions storage, 1060, Department of State storage areas, 1360, South Gate, marina, munitions bunkers, and golf course and marina clubhouses would occur resulting in minor emissions. Additionally, in ADP V, keeping food service preparation and storage off base with transportation onto base instead of constructing a facility on base would create additional emissions, although not significant when compared to multiple large-scale construction projects (refer to the preceding tables). Considering that the No Action Alternative prevents the larger scale construction proposed in the 2011 General Plan, no significant impacts to air quality are anticipated.

4.1.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. Compared to the Proposed Action, this alternative would reduce emissions because of significantly minimized new construction, therefore no significant impacts to air quality are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. Compared to the Proposed Action, this alternative would reduce emissions because of the reduction in new construction, therefore no significant impacts to air quality are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. Compared to the Proposed Action, this alternative would reduce emissions because of the reduction of new construction, therefore no significant impacts to air quality are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This alternative would result in minimal emissions as compared to new construction, and no ACM has been found in the dormitories, therefore no significant impacts to air quality are anticipated due to this alternative.

Alternative 1 for DEOMI would reduce the square footage of the addition. Compared to the Proposed Action, this alternative would reduce emissions because of the minimization of new construction, and no ACM is present because this facility is only about 10 years old, therefore no significant impacts to air quality are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. This alternative would minimize construction and require some renovation work, therefore, emissions would be reduced and no significant impacts to air quality would result.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. Compared to the Proposed Action, this alternative would reduce emissions because of the reduction in new construction, therefore no significant impacts to air quality are anticipated due to this alternative.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. Compared to the Proposed Action, this alternative would reduce emissions because of the reduction in new construction, therefore no significant impacts to air quality are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This would create short-term emission increases due to dust generation and ACM abatement, however, proper management and handling and adherence to occupational health requirements would reduce emissions especially compared to a large construction project, therefore no significant impacts to air quality are anticipated.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. This alternative would not require demolition, but would require new construction of several smaller facilities, and would require some renovation work. Short-term emission increases would occur due to dust generation and small-scale construction, however, proper management with wetting down the area would reduce emissions especially when compared to emissions that would be generated from demolition of 5 facilities and a large construction project, therefore no significant impacts to air quality are anticipated.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. Compared to the Proposed Action, this alternative would reduce emissions because of the minimized demolition, therefore no significant impacts to air quality are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This alternative would generate the same amount of emissions as

the Proposed Action, however, the impact would be insignificant as discussed at the end of Section 4.1.1.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This alternative would generate miniscule emissions related to renovation work, and proper management and handling and adherence to occupational health requirements would reduce emissions especially compared to new construction, therefore no significant impacts to air quality are anticipated.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. Compared to the Proposed Action, this alternative would reduce emissions because of the reduction in new construction, therefore no significant impacts to air quality are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.2 Biological Resources

Impacts to biological resources would be considered significant if one or more of the following conditions would result:

- Substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations by the USFWS or FWC;
- Substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations by USFWS, FDEP or FWC;
- Substantial adverse effect on Federally-protected wetlands as defined by Section 404 of the Clean Water Act;
- Interfere substantially with the movement of native resident or migratory birds or wildlife species, wildlife corridors, or wildlife nursery sites;
- Conflict with USAF policies or regulations protecting biological resources; or
- Conflict with the provisions or an approved local, regional, or state habitat conservation plan.

The definition of "substantial" is dependent on the species and habitats in question and the regional context in which the impact would occur as determined through consultation with USFWS and FWC. Impacts may be considered more adverse if the action affects previously undisturbed habitat or if the impact would occur over a large portion of available

habitat in the region. These issues are discussed below, as applicable, with regard to their potential significance.

4.2.1 Potential Impacts of the Proposed Action

Threatened, Endangered, and Special Concern Species

Nesting/hatching sea turtles, manatee, wood stork, least tern, black skimmers, and gopher tortoise have the most potential to be affected because of direct and indirect effects of the PAFB General Plan's proposed actions.

The USFWS concurred with the 45 SW opinion that listed species mentioned above (they also included the Eastern indigo snake even though none have been observed at PAFB) may be affected, but would not be adversely affected by the PAFB GP actions. Mitigation required by USFWS included the 'Terms and Conditions' of the Biological Opinion issued for listed sea turtle protection through light management requirements. The mitigation measures include: 1) monitoring of Light Management Plans (LMPs) for compliance, 2) development of new LMPs for all new facilities within close proximity to the beach, 3) the use of the best technology to minimize sea turtle disorientations for replacement exterior lighting, 4) precluding the use of noncompliant lights from 1 May to 31 October unless essential for mission safety/security/launch/night training, 5) nesting surveys and disorientation monitoring continuance, 6) a minimum of 5 nighttime lighting surveys from 1 May to 31 October, 7) working with the Florida Department of Transportation to minimize impacts to sea turtles due to traffic lighting 8) annual reporting of disorientation/misorientation to USFWS, 9) 45 SW Environmental notification to base violators of rectification requirements and light management policies, 10) adherence to the 45 SW Instruction 32-7001 and LMP review by USFWS, 11) replacement of exterior lights with full cut off and shielded fixtures to prevent lighting or glow being visible from the beach, 12) maintaining operational constraints for lighting from 9 P.M. to dawn from 1 May to 31 October unless mission-critical, and 13) prevention of exceeding 3% incidental take or reinitiating consultation of take is exceeded.

In addition to mitigation requirements, the 45 SW utilizes best management practices, such as conducting surveys prior to project activities, to avoid and minimize impacts to listed species and will incorporate additional guidance provided by the USWFS (Appendix B) for PAFB GP actions. Several T&E sea turtle species have historically utilized PAFB shorelines for nesting, and an active program for sea turtle nest monitoring occurs with close coordination with regulatory agencies. New crossovers and pavilions are proposed at Picnic Tables Beach (ADP I), Beachhouse Beach (ADP II), Main Gate Beach (ADP II), Hangars Beach (ADP V), and Pineda Beach (ADP Via). Limited disturbance will occur on the beach, and the minimum amount of dune vegetation will be removed for new crossovers and elevated look-out pavilions. Sea turtle habitat and nesting may be affected, but not adversely with limitation of construction to the non-nesting season (November-April), prevention of removal of nesting habitat, continued sea turtle nest monitoring, and practical designs that incorporate pavilions and crossover only where they will serve the most benefit to beachgoers while limiting disturbance of the natural environment. Direct impacts to sea turtles or their nesting habitat (coastal shoreline/dune) are not anticipated from proposed action activities.

Indirect impacts to sea turtles are possible due to increased artificial lighting under the Proposed Action. Research has demonstrated that females will avoid highly illuminated beaches and therefore postpone nesting (Witherington, 1992). Likewise, disorientation (loss of bearing) has caused hatchling mortality, as the confused hatchlings move towards artificial light sources and dunes instead of the ocean. The Proposed Actions, in addition to other construction projects that have been analyzed separately, will result in thirteen new facilities on PAFB property in the next five years, the demolition of 29 facilities, and at least 15 renovation or addition projects that will involve some changes to exterior lighting. To minimize any impacts to T&E sea turtles from artificial lighting, the Proposed Action will conduct project activities outside of dark hours during the sea turtle nesting season (1 May – 31 October). Likewise, all exterior lighting proposed for any new facility will be in accordance with the 45th Space Wing Instruction (SWI) 32-7001, *Exterior Lighting Management*, dated 26 Jan 08, that was approved by USFWS. No utilization of exterior construction lighting from dawn to dusk from 1 May to 31 October would occur unless a specific construction Light Management Plan (LMP) is approved by 45 CES Environmental and the USFWS if there is a variance from the 45 SWI 32-7001. Any variances would be appropriately coordinated and consultation with USFWS will occur for LMPs that involve new facilities with large areas where lighting may be visible from the beach or that are in close proximity to the beach. Bollard, shoebox and downward-directed lighting will be required in exterior lighting designs to reduce sky glow effects. Modifications to traffic signals proposed at the Beachhouse Beach site (ADP II) and potentially at the Picnic Tables Beach site (ADP I) will entail construction of mast arm systems with well shielded signals to include the use of optically programmed signals as well as installation of additional screening of native dune vegetation in the vicinity of the signals to shield the beach. All lighting will be shielded from direct visibility of the beach to include interior lighting producing exterior glow. Windows will be tinted to 45% light transmittance or less for facilities near the beach, and window treatments will be utilized to block interior lighting visible to the exterior. Per the Biological Opinion issued to the 45 SW for light management under the ESA, the 45 CES Environmental will continue to perform light inspections, monitor disorientations, and work with base personnel to correct improper lighting. No significant impacts to sea turtles or their habitat are anticipated. Consultation response from USFWS (Appendix B) resulted in concurrence with the AF opinion of no significant adverse impacts to sea turtles as long as the proposed measures noted by the AF are followed in addition to USFWS measures clarifying that the 45% light transmittance is inside to outside as measured through the glass, lighting directly visible from the beach is shielded, dune vegetation is planted where light shielding can be improved, and LMPs are reviewed during the early design phase instead of during late design to provide the best available technology.

Manatees have been observed in the Banana River near PAFB, within the PAFB Marina (ADP VI) and Survival Canal. The regional stormwater permit, that includes modifications to the PAFB Golf Course (ADP VI) and PAFB airfield drainage canals, will cause a reduction of a freshwater source that has been used by small groups of manatees over the years as the outfalls drain into the PAFB Marina. These outfalls being changed from fully open to overflow structures, although reducing a freshwater source, will also reduce pollutant loading associated with fertilizer and pesticide use on the golf course which will improve water quality for the manatee. Additionally, the reduction in freshwater may also reduce the frequency of manatee in the PAFB Marina which is also safer for manatee as this will reduce propeller strike interaction potential. Any stormwater pipes that connect with the Banana

River or near waters utilized by manatees that are between 8 inches and 8 feet in diameter will be fitted with grates to prevent entrapment. No adverse impacts to manatees are anticipated from regional or other stormwater permit actions. The only project occurring in waters utilized by manatee under the Proposed Action is the marina modification that is proposed in ADP VIb, South Base Community Support West. No significant impacts are anticipated to this species as no seagrass (food source) is found in the marina because it is dredged regularly, and the *Standard Manatee Conditions for In-Water Construction* (2011) will be followed such that vessel operations shall occur at idle speeds, turbidity barriers won't impede manatee movements, work will cease and vessels will be shutdown if a manatee comes within 50-ft of the construction area, and signs will be posted during construction to alert vessels/workers of manatee potential presence and legal protections. The marina project will repair 110 of the 234 total slips including piling replacement in phases, remove 16 slips to allow for reconfiguring of the lengths of slips to accommodate larger boats (reducing the number of powerboat slips), and upgrade water and electrical services. A Nationwide USACE permit will be obtained for this maintenance project, and all conditions for natural resource protection will be followed. A separate EA would be required if design options change and additional slips are considered that would raise the number of power boats using wet slips at the PAFB Marina. Requirements from the *Brevard County Manatee Protection Plan* (2003) would be followed in consideration of power boat numbers in wet and dry slip/storage.

Dredging of the marina is not currently scheduled, but it is assumed that dredging will be required in the next five years for basin depth maintenance. The standard manatee conditions will be followed as noted above for any construction work in waters utilized by manatees, dredging will not occur at night, and mooring fenders will be used on larger construction vessels to prevent potential crushing of manatee. A Nationwide USACE permit will be obtained for dredging maintenance, and all conditions for natural resource protection will be followed. Marina repair, construction and dredging within the marina may affect, but is not likely to adversely affect the manatee. Prior consultation with the USFWS (2010) concerning significant replacement of pilings in the marina resulted in the USFWS response that impacts to manatees would be "insignificant and discountable" with USAF acknowledgment of following of the standard manatee conditions. The USFWS concurred with the AF opinion again (Appendix B) and stated that in addition to the established conditions mentioned above, at least one person on the crew conducting in-water work must be designated as a manatee observer.

Maintenance dredging of drainage canals is not anticipated to adversely affect endangered wood storks. The Proposed Action doesn't include projects to fill canals that have been used as a foraging location for the occasional wood stork observed on PAFB. Dredging would displace foraging birds to another canal during activity, but the canal would be available shortly after the work was complete. No adverse impacts to the wood stork are expected, and the USFWS concurred with this determination (Appendix B).

Gopher tortoise have been observed on the landfill (SWMU P023) proposed for reutilization as a day use light recreational/fitness trail system in ADP IV. Avoidance of all tortoises and their burrows will occur for this project and areas will be flagged with buffers during construction. Per FWC, a tortoise relocation permit is not required if a 25-ft buffer is extended from the mouth of the burrow (Appendix D). Additionally, the landfill is being

restored with native vegetation to provide some habitat, the trails will be designed to avoid tortoises, and the 45 CES Environmental will monitor gopher tortoise activity throughout construction and eventual trail use (projected within five years). No significant impacts to the gopher tortoise are expected. The Eastern indigo snake has not been observed on PAFB, but if this species should be present and may be utilizing gopher tortoise burrows, then they will be protected because the burrows will be avoided. Additionally, the *USFWS Standard Protection Measures for the Eastern Indigo Snake* will be followed such that workers will be informed and signage posted during construction noting the avoidance and protection requirements for this species. The USFWS concurred with this AF determination concerning the Eastern indigo snake (Appendix B).

Finally, least terns and black skimmers have not been observed nesting on PAFB beaches, but have been observed feeding in the Atlantic Ocean, the Banana River adjacent to PAFB and some wet stormwater retention ponds on PAFB. They have also been observed nesting sporadically on 2-4 flat gravel roofs in the PAFB North Base Administrative (ADP II) area. Nesting on roofs does not occur annually, and appears to be affected by crow predation as observed several years ago. Projects are programmed to replace deteriorated gravel roofs with rubberized materials in ADP II to correct leaks, stop internal water damage, and prevent projectile hazards during hurricanes/severe winds as the gravel caused extensive window and glass door damage during prior storms. To prevent direct impacts to least terns and black skimmers, roof replacement won't occur during nesting season, April to August. Roof nesting will continue to be monitored by 45 CES Environmental across all of PAFB, and if active nesting is observed then facility managers will be alerted so disturbance is eliminated or reduced through minimal human activities on or near the roof. There are adequate locations along PAFB beaches and the sandy Banana River shoreline for nesting, however these species aren't inclined to nest here due to human disturbances caused by walking in the vicinity of potential nest sites. The removal of 2-4 small roof nesting sites (each roughly a little over 8,000 sq ft) will not jeopardize the continued existence of these species. No significant impacts are anticipated for least terns or black skimmers. The USFWS concurred with this determination, but noted conservation recommendations to designate natural suitable nesting habitat for least terns and black skimmers and limit human access (Appendix B).

Separate ESA Section 7 consultations may be required through LMP review should they be required per the BO terms, and if project scopes change to the degree that the potential for adverse impacts may result. Based on the existing Proposed Actions, no substantial adverse impacts are anticipated to any listed or candidate species or their habitat nor will any policies or regulations related to T&E species be violated. The USFWS has concurred with the AF opinion (Appendix B).

Essential Fish Habitat

Seagrass is found directly offshore along the Banana River in shallow water of a few inches up to 10 ft depth where light attenuation is greater due to improved water clarity. Seagrass is considered Essential Fish Habitat, and is protected under the Magnuson-Stevens Fisheries Management Act (MSA) and Florida regulations. Mangroves are also afforded protection under the MSA and State laws. Three species of mangroves are present at various locations along the western boundary of PAFB along the Banana River shoreline and also within the PAFB Marina and drainage canals that connect with the Banana River.

Under the Proposed Action, the only project to occur in water is the PAFB Marina dock repair and dredging within ADP VIb. The Proposed Action activities are not anticipated to impact seagrass as it is not present in the marina because it is dredged regularly and too deep for adequate light attenuation, and appropriate BMPs such as turbidity curtains will be implemented during dredging activity and piling/dock replacement to contain turbid waters during construction as required by regulatory permits. Mangroves will need to be trimmed along the docks of the marina in order to accommodate deck replacement, but mangroves will not need to be removed according to the current project design. Should the design change and require mangrove removal, then a separate Environmental Assessment will be developed with inclusion of mitigation requirements in accordance with the MSA, the CWA, State laws, and Executive Order 11990, *Protection of Wetlands*. The 45 SW has improved habitat quality for mangroves found along PAFB property beginning approximately seven years ago with its invasive vegetation removal program per Executive Order 13112, *Invasive Species*. The mangroves were historically impacted by Brazilian pepper and/or Australian pine. Now only spotty mature invasives and occasional invasive seedlings are encountered and treated with herbicide where mangroves are flourishing again. Invasive vegetation control will continue under maintenance activities for PAFB. Mangroves and seagrass will be protected with herbicide application to invasives being limited to during little to no wind days to prevent overspray, the use of only aquatic-approved herbicides near waterways, and careful mechanical and hand clearing treatments that avoid damage to mangroves. Additionally, projects involving maintenance of PAFB riverine shoreline property with repair of existing rip-rap and/or installation of new rip-rap above the sovereign-submerged waterline (1.1 ft elevation) will avoid wetlands and mangroves, and any required permits would be obtained. No adverse effects to EFH due to the Proposed Actions are expected.

Wetlands and Floodplains

The Proposed Actions addressed in this EA will not adversely affect wetlands. Project scope changes that may require adverse impacts to wetlands, including isolated wetlands, will require separate environmental impact analyses documentation and permit determinations. Permits related to actions in regulated waters will be obtained as required under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Temporary impacts to wetlands may occur with rip-rap repair (regulatory opinion through the permitting process) and native vegetation plantings along the shoreline for erosion control repair, however, areas will be restored to prevent erosion and natural occurring wetland vegetation will be able to recruit back into temporarily disturbed areas. No significant adverse impacts to wetlands are anticipated due to the PAFB Proposed Actions for the General Plan and two projects in former South Housing.

According to Federal Emergency Management Agency/Flood Insurance Rate (FEMA/FIRM) maps, the 100-yr floodplain covers most of ADP I (privatized North Housing), all of PAFB beachfront (ADP I, II, V, VIa), portions of areas east of the Banana River shoreline (ADP III), the FAMCAMP expansion area (ADP IV) on the west side of the Survival Canal, the southern portion of the airfield south of the Survival Canal mouth, the PAFB Marina (ADP VIb), most of the munitions area (ADP VIb), and the majority of the PAFB Golf Course (ADP VIb). To follow EO 11988, *Floodplain Management*, the beneficial values served by the floodplain should be restored and preserved, however, if there are no other practicable alternatives to construction in the 100-yr floodplain then minimization of harm to or within the

floodplain in required. Structures in the 100-year floodplain must incorporate floodproofing measures per EO 11988 to reduce loss of property and life. Fill materials will be added to the building footprint where necessary to raise the building above flood elevations designated on FEMA/FIRM maps, and other structures will be elevated on pilings/stilts adjacent to Atlantic Ocean beaches to reduce impedance of floodwaters as they are able to pass under the structures. Construction will cause some necessary ground disturbance and excavation within the floodplain, however, sites would be restored with grass sod and seed or native vegetation depending on the location. New facility construction in the 100-yr floodplain is generally discouraged so for facilities near the Banana River or Atlantic Ocean, site enhancement and development is very complicated, however, there are very few alternatives that are possible if a facility already in the floodplain needs enhancements or additions to improve sustainability, modernization, or QOL.

Per NEPA requirements, the AF must analyze all reasonable alternatives and may eliminate alternatives based on reasonable selection standards. The selection standards for each project can be found in Table 2-2. Reducing the number of QOL amenities (pavilions, lookout decks, tiki bars, etc.) or reducing the square footage of facilities in the floodplain are the only reasonable alternatives that were carried forward for analyses. The No Action Alternative did not meet all of the selection standards for each of the projects, and is discussed below in Section 4.2.2. The alternative analysis discussion for Biological Resources is found in Section 4.2.3 below.

Shoreline erosion control repair/maintenance may be necessary along the entire extent of PAFB's Banana River shoreline (ADP I, II, III, IV, VIb, and the airfield) should severe storms cause damage to existing rip-rap, natural and planted native vegetation. This repair will maintain shoreline protection necessary to support the base's mission, reduce the effects of erosion, make the area safer with gully removal, restore some habitat quality with native plantings that are natural ground stabilizers, and improve QOL as an intact shoreline can be used for recreation as well is more aesthetically pleasing. There is no practicable alternative to conducting repairs to erosion prone areas in the floodplain. Native vegetation planting will occur as much as practical, and as noted earlier, if wetlands must be adversely impacted, then separate environmental impact analysis will be prepared. Additionally, stormwater management projects are planned in the 100-yr floodplain where regional approaches are attempting to consolidate multiple Environmental Resource Permits. Modifications to existing dry retention swales will occur in the 920 RQW area in ADP III as well as in the PAFB Golf Course and PAFB Marina areas in ADP VIb. Changes to stormwater systems are necessary to: support the base's mission and improve developed areas that are currently restricted due to swale locations, make the areas safer by preventing the need to park in swales, improve QOL with more convenient parking and pedestrian access to facilities, and provide for greater value through more efficient stormwater systems compared to cost of the stormwater modification projects. There are no practicable alternatives to modifying stormwater swales in the floodplain because there is limited space available outside of the floodplain for large, shallow stormwater swales because of the need for parking and related infrastructure close to each building. Smaller, deeper stormwater swales (especially within the PAFB Airfield Accident Potential Zone) aren't acceptable because of the potential to become bird attractants that may cause safety hazards with aircraft/aircrew. Existing wet stormwater drainage canals in the floodplain need to be dredged and cattail and aquatic vegetation removed to maintain stormwater capacity and

reduce bird attraction. Stormwater swales will not be designed such that wetlands are impacted. There are no practicable alternatives to modifying or maintaining stormwater swales in the floodplain because there is limited space available outside of the floodplain because of the need for parking and related infrastructure close to each building that is already near the floodplain and the airfield, and existing swales/ditches (in the floodplain) need to be dredged to sustain treatment capacity. It is more environmentally sound to re-develop stormwater systems in the floodplain to assist in tying systems together to prevent construction of facilities and parking lots in the floodplain due to space constraints as dry stormwater systems can be large due to the inability to use deep and wet systems because of Bird Aircraft Strike Hazard risk.

Enhancements to the riverside fitness trail found within ADP I, II, III, and IV are also possible such as new benches, small pavilions for shade, additional water fountains and emergency phones. The riverside trail is in the 100-year floodplain (except in a few locations where a seawall is located and FEMA/FIRM doesn't show flood zones beyond the wall), but is several feet away from the shoreline so elevations are generally higher than or at the estimated flood zone elevations. Improvements to the trail will: support the base's mission by providing enhanced fitness and QOL options outside of the gym, improve safety and health by providing more water fountains, emergency phones, and an improved alternative fitness and recreation location, limit environmental impact with minimizing construction in core use areas on the trail, and provide for higher value of QOL assets compared to cost of the enhancement projects. There is no practicable alternative to providing enhancements to the riverside trail/sidewalk located in the floodplain; these amenities can not be shifted out of the floodplain or they would not supplement the trail.

The beach projects identified in ADP I, II, V, and VIa occur along the Atlantic Ocean coastal beachfront within the 100-yr floodplain. In order to retain beach areas as major QOL recreation assets for Base personnel, new construction is planned for Picnic Tables Beach, Beachhouse Beach, Main Gate Beach, Hangars Beach, and Pineda Beach. As described in Section 2.1, Proposed Action, each PAFB beach location will have various construction projects from adding new parking lot area to new pavilions and dune crossovers. Safety has become an issue at several of the beach access locations as the parking lots become full, and beachgoers park adjacent to the lots along SRA1A which has a 55 mph speed limit. Blockhouse/Beachhouse patrons also have had close calls with A1A traffic as they use the pedestrian walk from the lot west of A1A. Additionally, there are only two large pavilions and two restroom facilities that are available for PAFB personnel using the beaches, one each on the North and South Beaches. To enhance beach amenities, new pavilions or roofed lookout decks and restrooms are proposed at all of the beach access locations dependent on funding availability. Minimization of harm to or within the floodplain will occur as structures will incorporate floodproofing measures per EO 11988 to preserve the natural qualities of the floodplain for flood management, and reduce loss of property and life. Structures will be raised above flood elevations with pilings/stilts adjacent to Atlantic Ocean beaches to reduce impedance of floodwaters as they are able to pass under them. Beach amenity improvements are compatible with the base mission, will improve safety with parking lot enhancements, limit environmental disturbance to discrete areas for improved beach access, satisfy QOL and fitness/readiness needs with providing a greater number of options and enhancements, and provide high QOL value compared to cost. There are no

practicable alternatives to conducting beach access improvements within the 100-year floodplain of the Atlantic Ocean.

The FAMCAMP expansion and landfill recreational re-use (ADP IV) will occur adjacent to regulated waters along the mangrove fringe on the banks of the Survival Canal and the Banana River. When designs for this area are finalized, any actions that impact wetlands will be analyzed in separate NEPA documentation, and may require a compensatory mitigation proposal approved by the SJRWMD, USACE, and NMFS. FAMCAMP expansion and reuse of the landfill for day-use recreation are compatible with the base mission, will improve safety with a stormwater system that prevents flooding throughout camp sites and roadways and pedestrian walks that prevent hazards and allow ease of movement, will limit environmental disturbance with avoidance of wetlands and keeping expansion within areas that are already developed/disturbed, will satisfy QOL and fitness/readiness needs with providing a greater number of options and enhancements, and provide high QOL value compared to cost. These upgrades will allow for PAFB to implement a rate increase, resulting in an annual projected income of approximately \$47,000. PAFB would be providing a basic service to meet customer demand, and the project has an ability to provide an excellent new revenue stream for the Morale, Welfare, and Recreation (MWR) Fund with estimated new gross revenues in excess of \$57,000 annually. Each year, PAFB competes with MacDill AFB and Tyndall AFB for snowbird travel, and these three Bases are three of the highest revenue producing campgrounds in the Air Force Inventory. If these projects are not implemented, the PAFB FAMCAMP will not be able to remain competitive with the MacDill and Tyndall AFB campgrounds, and would result in a huge potential to influence a negative impact on the MWR Fund.

All floodproofing measures will be taken to avoid loss of life or property. Construction and stormwater management will be mindful of the requirement to minimize impacts to or within the floodplain, and will ensure designs prevent impedance of floodwaters. FAMCAMP expansion will occur in the 100-yr floodplain, and there are no practicable alternatives to this construction because there is no other location on PAFB to relocate the FAMCAMP to that will also provide the natural recreational amenities and aesthetic quality of the riverside location (in existence for over 20 years).

Within ADP VIb and the 100-yr floodplain, the Proposed Actions cover the extensive repair of the existing docks at the PAFB Marina, construction and renovations for the marina clubhouse and tiki bar as well as an addition to the golf course clubhouse (potential conversion to a Collocated Officer and Enlisted Club) and proposed tiki bars, and various golf course greens and infrastructure maintenance requirements including canal dredging and sustainment under the regional stormwater permit for the south part of PAFB. Development and enhancements within the 100-year floodplain in ADP VIb are compatible with the base mission, will improve safety by repairing docks that are severely damaged and provide renovated and new facilities that meet all new safety and occupational health codes, will limit environmental disturbance with avoidance of wetlands and keep construction within areas that are already developed/disturbed, will satisfy QOL and fitness/readiness needs with providing a greater number of options and enhancements, and provide high QOL value compared to cost. All floodproofing measures will be taken to avoid loss of life or property. Construction and stormwater management will heed the requirement to minimize impacts to or within the floodplain, and will ensure designs prevent impedance of floodwaters. Construction/enhancements to the South Base Community Support West ADP (VIb) will

occur in the 100-yr floodplain, and there are no practicable alternatives to this construction because the PAFB Golf Course and Marina are in the floodplain and construction and renovations are required for QOL enhancements. Although, elevation surveys for as-built construction drawings for the Golf Course Clubhouse and the Marina Clubhouse note elevations above the 4-ft flood elevations at 7.6 ft and 6.7 ft, respectively.

Finally, maintenance activities on the southern portion of the airfield and the munitions area (ADP VIb), located in the 100-yr floodplain, will consist of tree/shrub removal, surface smoothing, canal dredging, underground utility upgrades, pavement removal and mill/overlay, and facility/infrastructure sustainment. Vegetation removal and surface smoothing is required to maintain height criteria based on distances from the runway centerline for airfield flight safety. Canal dredging removes vegetation that may create flooding and/or bird attraction near the airfield. Utility, pavement and facility upgrades sustain mission requirements and maintain safety standards. Environmental impacts are minimized by keeping maintenance/upgrade activities within previously disturbed and developed areas with minimal habitat quality and avoiding higher quality habitat near the shoreline within wetlands. There are no practicable alternatives to airfield and munitions area maintenance located in the 100-yr floodplain because work is necessary to continue to sustain the AF mission.

Best Management Practices will be applied to reduce degradation to the floodplain by leveling ruts caused by heavy equipment, containing sediments to prevent unintentional release to surface waters during heavy rain events by maintaining and repairing silt fencing, and installing sod to restore and stabilize the ground after construction disturbance. Construction in the floodplain will not increase the likelihood for loss of life because storm tracking at PAFB proactively announces conditions and immediately notifies employees and the public of closures if necessary to prevent mishaps. In conclusion, the Proposed Action causes negligible floodplain impacts. No practicable alternatives to construction in the 100-yr floodplain exist as no other alternatives meet the selection standards or provide the mission sustainment requirements or desired QOL enhancements.

Fish and Other Fauna

No significant adverse impacts to fish and wildlife would be expected due to Proposed Action activities since the construction and demolition projects are occurring in previously developed/disturbed areas. Canal dredging would occur in small segments to prevent fish kills. Fish usually swim to undisturbed waters, and are anticipated to avoid the work area. The practice of working in small segments instead of large segments in one day is anticipated to lessen the chance for a large fish kill due to suffocation with heavy sediments in the water column.

Noise rather than the sight of machines appears to cause disturbance to wildlife. The combination of increased noise levels and human activity would likely cause temporary displacement of some animals that forage, feed, nest, or have dens within a 15-meter radius (or greater for more sensitive species) of noise sources. Potential impacts from construction/dredging noise would be short-term and would be expected to only temporarily affect fish and wildlife utilizing PAFB. Observations of wildlife indicate that they are already conditioned to daily aircraft flight activity noise.

In order to avoid attracting wildlife to the work sites, the contractor would keep the construction area, including storage areas, free from accumulation of waste materials or rubbish at all times. Waste materials generated during demolition, construction and renovation activities would be hauled off at the end of each workday and disposed of. Prior to the initiation of any project construction, ground disturbance or construction materials laydown, surveys would be conducted to determine the presence of any T&E species, other species of concern, or other native fish and fauna, and avoidance and impact minimization measures will be identified prior to project commencement. 45 CES Environmental would perform a walk-down of the Proposed Action area prior to commencement of activities to locate any wildlife that would not be able to flee. If animals or eggs are identified that would be harmed, the 45 CES Environmental would remove/relocate the wildlife to a safer area. Significant adverse impacts from Proposed Action activities are not expected to occur to fish and other fauna.

Migratory Birds

Based on observations by PAFB 45 CES Environmental, migratory birds that use PAFB are opportunistic and use landscape palm trees, grasses, airfield grasslands, and stormwater canals and ponds for nesting, resting and foraging. Large flocks and roosting colonies have not been observed on PAFB due to the lack of high habitat quality except for larger numbers of birds that use the PAFB beaches adjacent to the Atlantic Ocean and Banana River shoreline and waters for resting and foraging. Active bird harassment is routinely occurring with the Bird Aircraft Strike Hazard (BASH) program within the airfield zone, and aircraft noise occurs daily. Short-term, intermittent impacts to feeding/foraging/resting of migratory birds will occur due to Proposed Action activities, however, feeding/foraging/resting areas will be present on other portions of PAFB as activity will be incremental and will not affect all parts of PAFB at the same time. Some depredation is necessary to reduce aircraft/bird strike hazard risk, but is legally conducted under a USFWS Permit issued to the 45 SW. If adverse impacts to migratory birds are anticipated after project designs are reviewed, then consultation with the USFWS will occur to address impact minimization measures. Significant adverse impacts from Proposed Action activities are not expected to occur to migratory birds. The USFWS concurred with this opinion (Appendix B), and noted Conservation Recommendations to attempt to designate nesting habitat and prevent human access.

Vegetation

Project activities would generally occur on previously disturbed and developed land that is vegetated primarily with Bahia grass, ornamental shrubs, and palm trees. Soil disturbance and increased introduction of particulates into the air should not result in harmful effects to vegetation especially if ambient air concentrations of criteria pollutants are below the NAAQS. Any exotic, invasive vegetation encountered (such as Brazilian pepper, Vitex trifolia or cogon grass) will be removed and properly treated on site. New landscaping, shade trees, and groundcover will comply with EO 13112, *Invasive Species*, such that native plants are used as much as practical and no invasive plants are purchased. Landscaping plans should incorporate native plants that are drought tolerant to minimize or eliminate irrigation and high-cost maintenance requirements. The Recreation Area Concrete Staging Area/Recreation Dump (SWMU P065) is located in an area proposed for a potential trail in

the Mid-Base Military Recreational Area ADP (IV). Although designated as "No Further Action," this dump site is covered with invasive vegetation such as Brazilian pepper, Australian pine, *Vitex trifolia*, and *Wedelia trilobata*. Should parts of the Recreation Dump (P065) be utilized for trails under the ADP, invasive vegetation found on the site must be treated with DoD approved herbicides, managed in accordance with EO 13112, and restored with native vegetation. Temporary impacts to native vegetation may occur during river shoreline erosion control repair. Finally, dune vegetation will be minimally disturbed for construction of lookout platforms, pavilions and crossovers for beach amenity improvements (ADP I, II, V, and VIa). No significant adverse impacts to vegetation are anticipated and beneficial impacts are expected with invasive vegetation removal.

4.2.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. This alternative would provide for operational support of PAFB, but not at the efficiencies projected to be available from the Proposed Action. Repair and maintenance work under the no action alternatives would result in temporary, intermittent impacts to T&E species, fish and other fauna. Some work may be required in the 100-year floodplain, but it would all be maintenance related and areas would be restored after any ground disturbances. Considering that the No Action Alternative prevents the larger scale construction proposed in the 2011 General Plan, no significant impacts to biological resources are anticipated under the No Action Alternative.

4.2.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. Compared to the Proposed Action, this alternative would reduce impacts to biological resource because of significantly minimized new construction and lighting, therefore no significant impacts are anticipated due to this alternative. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location, otherwise the selection standards wouldn't be met.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. Compared to the Proposed Action, this alternative would reduce impacts to biological resource because of the reduction in new construction and lighting, therefore no significant impacts are anticipated due to this alternative. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location, otherwise the selection standards wouldn't be met.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the reduction of new construction and lighting, therefore no significant impacts to air quality are anticipated due to this alternative. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location, otherwise the selection standards wouldn't be met.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This alternative would result in temporary noise disturbances; no significant impacts to biological resources are anticipated due to this alternative.

Alternative 1 for DEOMI would reduce the square footage of the addition. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the minimization of new construction, therefore no significant impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. This alternative would minimize construction and require some renovation work, therefore, impacts to biological resources would be reduced and no significant impacts would result. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location otherwise the selection standards wouldn't be met.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location otherwise the selection standards wouldn't be met.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location otherwise the selection standards wouldn't be met.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This would create short-term noise impacts but would reduce impacts to biological resources with construction and lighting reduction, therefore no significant impacts are anticipated.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. This alternative would not require demolition, but would require new construction of several smaller facilities, and would require some renovation work. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the reduction in the footprint of new construction, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the minimized demolition and noise impacts, therefore no significant impacts are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This alternative would generate the same level of impact to biological resources as the Proposed Action, however, the impact would not be significant because both areas are on improved/disturbed grounds and light management policies would be followed.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This alternative would not impact biological resources as all work would be interior.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. Compared to the Proposed Action, this alternative would reduce impacts to biological resources because of the reduction in new construction and lighting, therefore no significant impacts are anticipated due to this alternative. This is a reasonable alternative for construction in the 100-year floodplain, but there are no practicable alternatives to some level of construction at this location, otherwise the selection standards wouldn't be met.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.3 Cultural Resources

4.3.1 Potential Impacts of the Proposed Action

Procedures for assessing adverse effects to cultural resources are discussed in regulations for 36 CFR Part 800 of National Historic Preservation Act (NHPA). Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties. AFI 32-7065, *Cultural Resources Management*, provides guidelines for the protection and management of cultural resources on AF-managed lands. An action results in adverse effects to a cultural resource eligible to the National Register of Historic Places (NRHP) when it alters the resource characteristics that qualify it for inclusion in the register. Adverse effects are most often a result of physical destruction, damage, or alteration of a resource; alteration of the character of the surrounding environment that contributes to the resource's eligibility; introduction of visual, audible, or atmospheric intrusions out of character with the resource or its setting; and neglect of the resource resulting in its deterioration or destruction; or transfer, lease, or sale of the property.

The Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida have stated during review of the 45 SW Integrated Cultural Resource Management Plan that they do not wish to review or participate in any action unless it involves a prehistoric archaeological site or there is a Native American Graves Protection and Repatriation Act (NAGPRA) issue. PAFB has no recorded archaeological sites and no potential for NAGPRA issues. A National Park Service study concluded that the likelihood that significant archaeological sites were preserved at PAFB was limited, and no cultural resource survey was planned. Federal cultural resource preservation statutes (including the Native American Graves Protection and Repatriation Act) mandate that should artifacts be unexpectedly discovered during construction or excavation, such materials shall be identified and evaluated by an archaeologist. Even though not considered very likely, should human remains or cultural artifacts be encountered, federal statutes specify that work shall cease immediately and the proper authorities be notified. The 45 SW CRM (archaeologist) will work with the State Historic Preservation Office (SHPO) should unexpected discoveries be identified, and work will be only be authorized for re-commencement once the SHPO clears the site.

Recent (2010/2011) Historical American Building Surveys conducted by the 45 SW Cultural Resource Manager (45 SW CRM) have identified at least 29 structures and eight districts on PAFB as potentially eligible for listing on the NRHP. Under the Proposed Action, some potentially eligible historic buildings or sites found within ADP II, III, V, VIb, and the airfield would be renovated or demolished. Refer to Table 3-4 for the list of potentially eligible facilities and Table 3-8 for those proposed for demolition or renovation. The National Historic Preservation Act, Section 106 consultation responses from the SHPO (Appendix C) have agreed with the 45 SW CRM, and they believe that all facilities associated with the eight districts are contributing resources for the districts. The SHPO opinion is that demolition of these contributing resources is considered an adverse effect. The SHPO agreed that previously submitted documentation (*An Update and Revision of Three Historic Properties Surveys, Patrick AFB, FL, 2011*; *A Cultural Resources Assessment Survey of the Inert Storage Facilities, Patrick AFB, FL, 2007*; *A Historic Properties Survey of the High Explosive Storage Magazines, Patrick AFB, FL, 2007*; Florida Master Site File Historical Structure Forms; facility as-built drawings; and historic and current facility photographs) for

Facilities 1322, 1327 and 1330 within the Inert Storage Facility Historic District and for Facilities 1425, 1432, 1435, 1437, 1440 within the High Explosive Storage Facility Historic District was adequate mitigation in addition to a proposed high definition digital documentation survey for both districts and their contents. No Memorandum of Agreement was required according to SHPO for either of these two districts.

Likewise, the SHPO stated in Section 106 consultation response that they expect to review plans for 22 facilities proposed for demolition on a case-by-case basis (Appendix C). Specifically, the SHPO responded that, in consultation for Facilities 313, 408, 410, 557, 559, 560 and 3650, case studies would be required to document what the 45 SW's alternatives are and what modifications to projects could occur to avoid or minimize adverse effects to cultural resources. Then the 45 SW must make this case study information available to the public to satisfy procedures related to *Resolution of Adverse Effects* of the NHPA. This information must also be made available to the Advisory Council on Historic Preservation (ACHP) in order to make a determination between the three parties if a Programmatic Agreement is required, and then develop the terms of a Memorandum of Agreement for mitigation of adverse effects. NEPA analyses for these other 22 facilities (some proposed for demolition well beyond the five years covered in this EA), in addition to projects proposed that may affect contributing elements for the airfield (PAFB Facilities Landplane District) can not be finalized without this coordination, therefore, these facilities will be analyzed in separate NEPA documents once there is resolution and agreement between the 45 SW, the SHPO and the ACHP concerning accepted mitigation for adverse effects.

Facilities proposed for demolition in the next five years that are not considered eligible for listing on the NRHP per SHPO consultation response are 515, 522, 523, 524, 533, and 739 (Appendix C). No mitigation for demolition is required for these listed facilities. In addition, facilities 912, 938, 960, 980 and 1968 are older than 50 years (constructed mid-1970s to 1990s), are not eligible for listing, and, therefore, were not included in SHPO response.

4.3.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. This alternative would provide for operational support of PAFB, but not at the efficiencies projected to be available from the Proposed Action. Project managers will be notified of any historic building NRHP eligibility and repair and minor renovation project designs would be reviewed by 45 CES Environmental (and specifically the 45 SW CRM) so any potential cultural impacts can be eliminated early on during the design phase. Considering that the No Action Alternative prevents the larger scale construction and demolition proposed in the PAFB General Plan, no significant impacts to cultural resources are anticipated.

4.3.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. This alternative does not impact cultural resources.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. This alternative does not impact cultural resources.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. This alternative does not impact cultural resources.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. The dorms are not eligible for listing; this alternative does not impact cultural resources.

Alternative 1 for DEOMI would reduce the square footage of the addition. DEOMI is not eligible for listing; this alternative does not impact cultural resources.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. FamCamp and 1657 are not eligible for listing; this alternative does not impact cultural resources.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. FamCamp and the closed landfill are not eligible for listing; this alternative does not impact cultural resources.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. This alternative does not impact cultural resources.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. Facility 313 is eligible for listing on the NRHP. This alternative will more than likely require consultation with the SHPO if architectural changes are being considered, however, it is not likely that an

adverse effect will result because it is assumed that the majority of the work will be interior. If the design does result in adverse effect, then this alternative would need to be analyzed through the case study for 313 and would require inclusion in a supplemental EA.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. This alternative does not impact cultural resources.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. This alternative does not impact cultural resources as the SHPO already accepted mitigation for demolition of all three of the inert storage magazines.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This alternative does not impact cultural resources.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This alternative does not impact cultural resources.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. This alternative does not impact cultural resources.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.4 Geology and Soils

4.4.1 Potential Impacts of the Proposed Action

The principal factors influencing stability of structures are soil and seismic properties. Soil, in general, refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support structures and facilities. Relative to development, soils typically are described in terms of their type, slope, physical characteristics, and relative compatibility or limitations with regard to particular construction activities and types of use. A significant impact on soils would result if substantial erosion or loss of topsoil occurred. The potential for erosion is highest during demolition and construction activities. Grading would cause loss of some ground cover for the new facilities, which would increase the potential for soil erosion. To reduce the impacts of erosion, standard construction BMPs would be implemented such as the use of silt fences,

mulch, siltation basins, and revegetation of disturbed areas to control erosion.

The greatest number of projects planned in the next five years that will require site grading and fill will be within the Mid-Base East Support development area (ADP V). The potential for erosion and stormwater run-off would be greatest in this area. New construction will be subject to conditions of NPDES permits and the SWPPP. The SWPPP would specify measures to reduce or eliminate any adverse erosion and sedimentation impacts. Compliance with established plans and policies and incorporation of standard erosion control measures into project design and construction requirements would reduce erosion potential to less than significant. For example, personnel will have appropriate training so they understand how to reduce impacts of stormwater runoff. Additionally, the practices of street sweeping and removal of debris from around storm drains, the use of secondary containment for drums and tanks, the practice of corrosion control, availability and use of spill kits, and proper maintenance of wash racks and trench drains will be followed to reduce impacts of stormwater runoff.

Dredge material from the marina (ADP VI) may require sampling prior to disposal due to the potential for sediments contaminated by petroleum products due to boat fuel spills especially with incidents during storm events as well as the potential for arsenic and heavy metals due to pressure treated wood rot and leachates. The 45 SW IRP had no documentation of these types of contaminants in marina sediments but sampling of the dredge spoils should be included in the contract to ensure proper disposal.

The 45 SW IRP manages regulated Solid Waste Management Units (SWMUs) at PAFB encompassing 29 sites throughout ADP II, III, IV, V, and VI that have some Land Use Controls (LUCs) or are under investigation or cleanup (refer to Appendix E). If any Proposed Action activities require disturbance below grade in a contaminated site, then guidance from the 45 SW Installation Restoration Program (IRP) will be provided during specific project design reviews concerning handling any contaminated media in each specific Proposed Action area. Facilities can be located on IRP sites if LUC requirements are met, contaminated media is left undisturbed, and land use is appropriate based on contamination levels. Mid Base River Industrial, ADP III, is proposed to remain as industrial use which is compatible with the 45 SW IRP LUCs for the six SWMU sites found in this area. Groundwater contamination in ADP II and III has been identified as vinyl chloride dichloroethene and petroleum constituents and other volatile organics. The most contaminated groundwater is found greater than 20 ft below the surface. If dewatering is not required for projects, and workers aren't anticipated to contact groundwater then no impacts related to contaminated media are expected. If dewatering is necessary, proper management and engineering controls must be built into the project for compliance with LUCs and regulatory requirements. Proposed Action activities in ADP IV related to FAMCAMP expansion and recreational amenity improvements will require coordination with the 45 SW IRP because several SWMUs aren't proposed for remediation, such as the northern end of the Survival Canal (SWMU P173), the closed landfills under the golf course (SWMU P023, P025), the closed landfill under the munitions bunkers (SWMU P024), the Recreation Area Concrete Staging Area/Recreation Dump (SWMU P065), and the closed landfill beyond FamCamp (SWMU P026). The fence restricting access to the Survival Canal would need to remain in place until the bottom sediment issues are satisfactorily addressed through 45 SW IRP, the concrete dump will not be opened for development until it is cleaned

up, and landfill access restrictions will not be lifted until the cap is restored sufficiently and approved by 45 SW IRP, the EPA, and FDEP. Additionally, monitoring wells used by the 45 SW IRP must not be impacted by PAFB Proposed Actions or if the wells will impact construction activities, then they must be properly closed and potentially replaced after construction at cost to the project.

General guidance establishes that as long as contaminated media is kept contained and disturbance doesn't cause migration or expansion (which can be attained with proper handling and management), no significant impacts to geology and soils are anticipated.

4.4.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation would occur for base maintenance purposes. Project managers will be notified of any potential contaminated sites in the project area, and project designs would be reviewed by 45 CES Environmental (and specifically the 45 SW IRP) so impacts can be eliminated early on in the planning stages. Facility repair and renovation generally does not affect geology and soils. Pavement repairs and canal maintenance may affect geology and soils, but proper BMPs and any permit requirements will be in place to prevent erosion. Any dredging that may affect a SWMU site will be coordinated with 45 SW IRP early on during the planning stage in order to prevent impacts and ensure proper management of any contaminated media. No significant impacts to geology and soils are anticipated due to the No Action Alternative.

4.4.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This alternative does not impact geology and soils.

Alternative 1 for DEOMI would reduce the square footage of the addition. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction. The trail project on the closed landfill (SWMU P026) includes additional fill so landfill contents aren't disturbed, therefore no significant impacts to geology and soils are anticipated due to this alternative.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction. Facility 313 is located over a groundwater plume so coordination with 45 SW IRP would be required during planning process should renovation require and groundwater disturbance to prevent impacts. No significant impacts to geology and soils are anticipated due to this alternative.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. A similar amount of ground disturbance may occur with this alternative, however BMPs will be used to reduce erosion. No significant impacts to geology and soils are anticipated due to this alternative.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction demolition, therefore no significant impacts are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. A similar amount of ground disturbance may occur with this alternative, however BMPs will be used to reduce erosion. No significant impacts to geology and soils are anticipated from this alternative.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This alternative does not impact geology and soils.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. Compared to the Proposed Action, this alternative would reduce impacts to geology and soils because of the reduction in new construction, therefore no significant impacts are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.5 Hazardous Materials and Waste

4.5.1 Potential Impacts of the Proposed Action

The nature and magnitude of potential impacts associated with hazardous materials and wastes depends on the toxicity, storage, use, transportation, and disposal of these substances. The threshold level of significance for hazardous materials, toxic substances, and hazardous wastes is surpassed if the storage, use, handling, or disposal of these substances substantially increases the risk to human health due to direct exposure, substantially increases the risk of environmental contamination, or violates applicable Federal, state, DoD, and/or local regulations.

Construction and maintenance activities associated with the Proposed Action would require the use of hazardous substances, such as petroleum, oil, and lubricants. During construction, use of these substances for fueling and equipment maintenance would have the potential for minor spills and releases. Hazardous materials and wastes would be handled in accordance with AFI 32-7042, *Solid and Hazardous Waste Compliance*, 45 SW Management Plan 19-14, and use of BMPs, such as secondary containment for construction vehicles and storage containers, would ensure that these substances would not be released into the environment.

All materials purchased and used in construction projects at PAFB are tracked through the Hazardous Materials Pharmacy, which manages the procurement, handling, storage and issuing of hazardous materials used at PAFB. Hazardous material authorization will be in accordance with AFI 32-7086, *Hazardous Materials Management*. Contractors will submit a Hazardous Materials Authorization Work Sheet (AF Form 3952), with the required supporting documentation, including a manufacturer specific Material Safety Data Sheet (MSDS) and estimated quantities for the work as required. All hazardous materials to be used at PAFB must be approved through the electronic USAF Hazardous Material authorization/tracking system prior to being transported onto the base. These procedures are equipped to handle potential waste increases due to implementing the General Plan projects. It is possible, but unlikely, for one of the proposed projects to introduce a new waste stream; however, it would be characterized to determine the correct waste disposition. PAFB would continue to be responsible for ensuring that any hazardous waste generated is disposed of in compliance with all Federal, state and local regulations. The 45 SW would also continue to track and keep a database of the inventories for all small quantity generation 180-day sites, and large quantity hazardous waste management 90-day sites. If small quantity sites have to move based on Proposed Action activities (potential for vehicle maintenance and the CE Complex) then the 45 SW Hazardous Waste Manager will ensure protocols and laws are appropriately followed and will record the record of site change and continue to track inventories through the database.

Standard design and construction techniques would be employed to ensure that no hazardous fumes permeate facilities, such as use of clean fill and vapor barriers. Environmental and occupational health program managers review project designs and inspect construction activities to ensure that appropriate engineering controls are in place.

Asbestos may be encountered as structures are renovated or demolished under the Proposed Action. A pre-demolition ACM survey must be completed and ACM should be abated before demolition. It is current USAF practice to remove exposed friable asbestos and manage other ACM in place, depending on the potential threat to human health. Friable asbestos, if encountered would be removed by licensed contractors and disposed of in an appropriate facility. Refer to Table 3-8 for a listing of facilities that may have ACM disturbance and/or abatement requirements.

Any demolition contractors must ensure all universal waste lamps are carefully handled and packaged to avoid breakage in preparation for recycling. Disposal of fluorescent lamps, high intensity discharge (HID) lamps, and low-pressure sodium lamps will be in accordance with 45 SW Management Plan 19-14. During the demolition of any facilities at PAFB, liquid PCBs may be present in electrical equipment such as large high and low voltage switches, capacitors, hydraulic systems, or compressors. If equipment of this nature exists, it should be sampled for PCBs prior to disposal. All electrical equipment containing dielectric fluid will have fluids sampled within six months of disposal. All items that contain PCB levels greater than or equal to 50 ppm will be handled in accordance with 40 CFR 761 and 45 SW OPLAN 19-16, and turned into the AF. Prior to 1983, PCBs were used in non-liquid applications such as caulk, sealants, paints, etc. If through documentation or prior knowledge, PCBs are believed to be present in areas proposed for renovation or demolition, the suspected materials must be disposed of properly in a regulated landfill.

Venting of ODCs into the atmosphere is prohibited. ODCs will be recovered and recycled prior to excising ODC containing equipment. ODC recovery operations will be performed by trained technicians using USEPA approved recovery equipment. Excised ODC equipment will be disposed of properly. New units will use non-Class I ODC substances such as R22, R123, R134a, or ammonia as the refrigerant. New units utilizing R-11 or R-12 are not to be purchased (Engineering Technical Letter 91-7, CFC Limitation in HVAC Systems).

Contractor would be responsible for sampling all wastes to determine whether they are hazardous or non-hazardous. Results of laboratory analyses will be provided to the Contracting Officer. All containers utilized for the management of wastes will be new and meet the Department of Transportation's performance-oriented packaging requirements. All containers must be properly labeled, separated by hazard class and stored for disposal. All hazardous waste containers designated for liquid storage must have appropriate secondary containment to prevent an uncontrolled release in the event of a breakage. Refer to 45 SW Management Plan 19-14 for specific information. The contractor will assume all liabilities for improper waste disposal. All USAF hazardous waste is to remain on base and will be shipped off-site by the USAF under an EPA identification number. Management of hazardous waste will be in accordance with 40 CFR 260-279. Locations of accumulation sites shall be approved by 45 CES Environmental prior to generating hazardous waste. Off-site disposal of solid non-hazardous waste lies with the contractor.

Solid waste is handled through ISWM and disposal is projected for Proposed Action activities to be consistent with tonnage over the last three years (2009-2011). Disposed solid waste for demolition and construction projects have been from 41 tons in three months to 292 tons in three months whereas green waste has been from 15 tons to 151 tons in three months. Solid waste that has been recycled (concrete, wood and metal mainly) has varied in the past three years from 5 tons to 249 tons in three months. Demolition proposed in the next five years will result in higher tonnage of solid waste disposed and recycled similar to the higher values obtained in the past three years when construction and demolition activities increased. Recycling of materials has been increasing as contracts have been more thoroughly reviewed and recycling metric reporting has been included in the contracts with follow-up inspections by 45 SW Asset Management so the contractors overseeing the construction, demolition, and renovation projects are aware of what is required and what must be reported.

No significant impacts are anticipated to hazardous materials and waste from the Proposed Action activities.

4.5.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation work would result for base maintenance purposes. Project managers will be notified of hazardous material and waste management through project design review by 45 CES Environmental so proper management is assured early on in the planning stages. No significant impacts to hazardous waste and materials are anticipated due to the No Action Alternative.

4.5.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This action may require the same amount of use of hazardous materials and generation of waste as the proposed action, however with adherence to all proper management and disposal requirements, no significant impacts are anticipated.

Alternative 1 for DEOMI would reduce the square footage of the addition. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. Compared to the Proposed Action (including extensive demolition), this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This action may require the same amount of use of hazardous materials and generation of waste as the proposed action, however with adherence to all proper management and disposal requirements, no significant impacts are anticipated.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. Compared to the Proposed Action, this alternative would reduce the use of hazardous materials and generation of waste, therefore no significant impacts are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.6 Safety and Health

4.6.1 Potential Impacts of the Proposed Action

Construction

Common safety hazards associated with heavy equipment operation during construction and demolition activities would exist. All appropriate regulations, including OSHA regulation 29 CFR 1926, *Safety and Health Regulations for Construction*, would be followed during project activities to minimize potential impacts.

The use of Personal Protection Equipment (PPE) may be required to reduce chemical hazard exposure during Proposed Action activities. Respiratory protection from dust masks to self-contained breathing apparatus may be utilized. If respirators are worn, requirements of the OSHA Respirator Standard, 29 CFR 1910.139, must be met. Eye protection, face shields, gloves, appropriate shoes, laboratory aprons, laboratory coats, and other protective equipment may be worn to protect personnel from hazards. Administrative controls may also be used to reduce the risk of overexposure to hazardous chemicals.

Specific safety precautions should be incorporated into the design of any new facility such as appropriate site lighting, building access areas and pedestrian walkways. New facilities must be compliant with the *DoD Minimum Antiterrorism Standards for Buildings* that will minimize antiterrorism vulnerabilities. In compliance with AFI 32-4002, *Hazardous Material Emergency Planning and Response Program*, new facilities will develop facility-specific emergency plans in accordance with state and Federal regulations to protect workers, public health and safety, and the environment in the event of an emergency. An Emergency Preparedness Hazards Assessment (EPHA) would also be developed to describe the hazards associated with operations and materials in the facility, and evaluate the consequences of events that might present a risk to health and safety of workers or members of the public.

Emergency procedures at PAFB would be reviewed annually and updated as needed when changes to operations could affect the level of risk associated with any facility. Each building's emergency procedures would describe types of hazards and operations associated with the facility as well as any administrative controls or engineered systems in place to mitigate the consequences of accidents or unexpected events. All new facilities at PAFB would ensure AF assets are appropriately protected from malevolent acts such as theft, diversion, and sabotage, as well as events such as natural disasters and civil disorder, by considering site and regional threats, protection planning strategies, and protection measures. Based on threat assessments and protection planning strategies, any new facility would be designed to provide the appropriate level of physical protection required to protect government-owned property against damage, theft, or intentional destructive acts.

The proposed actions to expand parking lots at Picnic Tables and Pineda Beach to correct safety issues created by lack of parking will be a positive effect to safety and health. Likewise, the drain pipe installation to correct flooding for the beach houses (251, 2533, and 255) will be a positive safety effect. Additionally, replacing all the deteriorating marina slips, correcting security issues at the South Gate, and repairing airfield lighting, pavement and

infrastructure will create positive safety effects.

Noise

Noise impacts from the operation of construction/demolition activities and equipment are usually limited to a distance of 1,000 feet or less. Significant impacts from noise would need to exceed OSHA safety standards. Based on EPA criteria, construction noise resulting in an hourly equivalent level of 75 dBA at a sensitive receptor would represent a significant impact. Noise from construction activity varies with the type of equipment used and the duration of use. During operation, heavy equipment and other construction activities generate noise levels typically ranging from 70 to 90 dBA at a distance of 50 feet (USEPA, 1971). All construction activities would be confined to daylight hours to avoid nuisance noise in the evenings.

Previous AF studies (USAF 2008) have analyzed the potential noise impacts from demolition of a two-story, 2,000 square foot concrete building located on one acre of land, and three acres of construction for a 30,000 square-foot concrete building with a 100,000 square-foot parking lot. The noise levels generated during demolition debris removal could reach a maximum of 76 dBA 50 feet from the site; at 500 feet noise would decrease to 61 dBA; and at 2,000 feet, noise generated from demolition activities would be 52 dBA. Although these levels are representative of one demolition or construction project, constructions/demolition activities would generally occur over a multi-year timeframe. Minimal to negligible impacts from construction noise would result for the following reasons:

- Heavy equipment that would generate the highest noise levels would not be used consistently enough to exceed the hourly equivalent noise level of 75 dBA for more than one hour. People outside of the boundaries of PAFB would be minimally affected.
- Construction/demolition activities would generally occur between 7:00 am and 4:30 pm.
- Temporary increases in truck (e.g., dump trucks, fill transports) traffic within and near the construction corridor would produce localized noise for brief periods, but would not create any adverse noise impacts to human health, the neighboring communities, or within PAFB.

In accordance with 29 CFR 1910, protection against the effects of noise exposure would be provided to personnel. When employees are subjected to sound levels exceeding those listed in Table 4-5, feasible administrative or engineering controls would be utilized. If such controls do not reduce sound levels to the levels presented, hearing protection would be provided and used to reduce exposure.

Table 4-5: Permissible Noise Exposures

Duration Per Day (Hours)	Slow Response Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102

1	105
0.5	110
0.25 or less	115

In general, construction and demolition noise would be intermittent and short-term in duration, and no long-term (recurring) noise impacts would result from implementation of the Proposed Action. However, exposure would need to be reduced in areas in which multiple projects are occurring. Generally, over the next five years projects are distributed across PAFB property and no single area will have long-term noise impacts due to multiple projects.

In terms of PAFB airfield operations, changes in noise levels 3 dB or greater would constitute a significant change in the noise environment. However, to achieve such changes would require doubling of the number of operations at PAFB. No part of the Proposed Action would produce changes in operations. Noise contours would remain unchanged from existing conditions. No significant noise impacts are expected based on General Plan Proposed Actions in combination with flying operations.

BASH

OPLAN 91-212, *Bird Hazard Reduction Plan*, requires a course of action for reduction of bird attractants to the airfield area and active harassment protocol to prevent habituation by birds. Maintenance of the airfield area includes techniques to deter bird nesting such as cutting grass regularly, removal and trimming of vegetation within specific height criteria depending on its proximity to active runways, dredging of canals, and removal of roosting/perching platforms in the airfield zone. These actions will reduce aircraft/bird strike hazard risk and improve safety. Also, preventing the use of wet detention within the Clear Zone and Accident Potential Zone and generally in areas in closer proximity to the runways will reduce bird attractants and BASH risk.

ACM

Asbestos-containing materials (ACM) may be present in buildings proposed for demolition or renovation (refer to Table 3-8). A pre-demolition ACM survey must be completed and ACM should be abated before demolition. Project designs for demolition of all facilities constructed prior to 1981 will fully address the NESHAP requirements for asbestos (40 CFR 61 Subpart M). Workers will be protected with proper PPE when working around or remediating ACM per OSHA requirements. Abatement of ACM during renovation projects will be a positive effect for safety and health by removing the risk that someone in the building may encounter friable ACM.

Heavy Metal Based Paints

Most facilities proposed for renovation or demolition are suspect for heavy metal paint coatings based on the age of the facilities (refer to Table 3-8). Testing should occur for disposal characterization. Activities involving painting and/or paint removal will be performed in accordance with FDEP, USEPA, OSHA, and HUD requirements for heavy metal and particulate matter emissions and heavy metal paint debris disposal.

Materials/coatings containing heavy metals should be left in place if possible and not disturbed. Paint removal and disposal of hazardous paint debris will be in accordance with 45 SW Management Plan 19-14 and RCRA. Large sized pieces of Construction and Demolition (C&D) debris with intact heavy metal paints shall be stored in covered containers until ready for disposal in a Class I or III landfill or a C&D disposal facility. The contractor will be responsible for sampling other generated waste streams (rinse water, chips, etc.) to determine if it is hazardous. Results of laboratory analyses will be made available to the AF.

No significant impacts are anticipated to safety and health due to proposed action activities.

4.6.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation work would result for base maintenance purposes. The 45 SW Safety and 45 SW Bioenvironmental (Occupational Health) units will remind project managers of all occupational safety and health regulations and requirements to prevent or reduce potential mishaps. No significant impacts to safety and health are anticipated due to the No Action Alternative.

4.6.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. This action would result in no changes to safety and health as long as structures are not elevated as this is in the airfield Clear Zone. No significant impacts are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for DEOMI would reduce the square footage of the addition. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. Landscaping plans are mindful of the Clear Zone and height criteria, and trees will be planted in accordance with height restrictions. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion,

one crossover and two lookout pavilions. This action would result in no changes to safety and health, therefore no significant impacts are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.7 Infrastructure and Transportation

4.7.1 Potential Impacts of the Proposed Action

Utility structures and lines should be identified prior to any excavation and an AF Form 103, Work Clearance Request, would be obtained. Should unidentified underground utilities be encountered during excavation, operations should cease until all utilities are properly identified. At Proposed Action construction sites, underground utility lines would be laid and tied into the existing mains. These lines would include electrical, water, wastewater and site drainage lines with appropriate drop inlets. Should larger potable water and/or sewer lines or lift stations be required to improve capacity and flow in the area, applicable permitting would be required.

All lighting will be coordinated with 45 SW Civil Engineering, 45 SW Safety, and 45 CES Environmental to ensure the appropriate balance between safety, energy conservation, sea turtle protection and reduced light pollution has been achieved. All exterior lighting will comply with 45 SWI 32-7001, *Exterior Lighting Management*, to prevent violations of the ESA.

Energy Conservation Improvement Program (ECIP) projects are designed to improve energy and water efficiency in existing DoD facilities to reduce utility costs and decrease energy and water consumption. Many of the projects identified in the General Plan would be eligible to incorporate these improvements. The benefits of the ECIP projects are greater than its costs, and the program has the potential to provide cost-effective energy conservation in the future. As such, and to the extent possible, each construction or repair project should have ECIP principles as a stated objective for compliance with energy conservation Executive Orders and initiatives.

Drinking Water System

Use of water for the proposed infrastructure improvement projects would not significantly affect availability of surface water or groundwater at PAFB or elsewhere in the area. The current water supply is considered sufficient, and anticipated increases due to construction and facility use are anticipated to be within current water allocation. If more water is needed, requirements could be met by the City of Cocoa and/or the City of Melbourne. Construction of new facilities with more efficient water conservation design and active

implemented water conservation measures coupled with demolition of existing facilities should offset any increased water use. No significant impacts to drinking water are anticipated.

Sanitary Sewer System

There are no known impediments to wastewater treatment capacity at PAFB in the near or distant future. An increase in wastewater flows may occur as a result of the increase in facility number and size with consolidation efforts, however, facilities will also be demolished and personnel moved to facilities to improve efficiencies. Under the Proposed Action, repairs to, and replacement of, certain sewer mains, lift stations and pumps in the lift stations would occur resulting in beneficial impacts to the sanitary sewer system.

Stormwater Drainage System

The implementation of the Proposed Action would create additional impervious surfaces through buildings construction and paving, increasing stormwater runoff. An exact amount of new impervious is not available, but an approximation based on planning data is 615,569 square feet. Likewise, several demolition projects and stormwater management re-configuration projects are proposed which will reduce impervious surfaces by about 98,134 square feet. Drainage from impervious surfaces would be controlled using grading, curbs, drains, gutters, and other standard construction and post-construction stormwater controls designed to prevent offsite impacts from stormwater runoff. Sustainable design measures must be incorporated into construction designs, utilizing retention and detention structures to minimize impacts from uncontrolled stormwater discharges. Any facilities constructed for industrial operations, such as aircraft maintenance, would be designed to meet spill prevention, control and countermeasures requirements under applicable Federal and state regulations. Such measures for utility systems would reduce the potential for adverse impacts from the stormwater system. The planned drainage repair and maintenance projects would result in beneficial impacts from the Proposed Action by removing the overgrowth of vegetation that cause stormwater flow problems in canals/ditches, and reduce treatment capacity in swales and ponds. Regional stormwater management system permit actions will consolidate existing stormwater permits and provide for better management of larger areas to more effectively calculate capacity and treatment with proposed development. Beneficial impacts are anticipated for PAFB stormwater systems.

Electric System

An increase in electrical use would be anticipated as a result of the overall increase in facility number and size with consolidation Proposed Actions in the General Plan. However, planned demolition of energy inefficient facilities and new facility construction employing energy-conserving equipment will reduce energy consumption and stress on electrical infrastructure. The current electrical system capacity would be adequate to meet the new requirements. The LEED program promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. Applicable projects would be LEED-certified, and are anticipated to enhance energy conservation by installing the newest, most energy efficient appliance or

apparatus relative to the action. Additionally, projects would follow Executive Order requirements to purchase Energy Star products and energy conserving equipment. No significant impacts are anticipated for electrical systems.

Natural Gas

The PAFB natural gas system appears to be adequate, at present. Whenever practicable and economically feasible, gas lines will be looped within the main base area. Currently, there are a number of “dead ends” in the gas distribution lines. A “loop system” for gas distribution is preferable to a system containing dead ends to allow continuous circulation and pressure maintenance. No significant impacts are anticipated.

Liquid Fuels System

The liquid fuel system includes all fuel delivery, storage and distribution facilities. All tanks comply with current regulatory requirements. Under the Proposed Action, projects have been identified to upgrade piping, remove or replace selected storage tanks, or replace underground storage tanks with aboveground tanks. These improvements to the system would result in beneficial impacts to the liquids fuel system by reducing the risk of releases due to old, corroded equipment and tanks, and with installation of upgraded and more sensitive sensors that can identify issues for correction before a problem becomes serious.

Communications

Communication utilities are critical to the AF and PAFB missions, therefore, only beneficial impacts would be expected from improvements and upgrades to its existing communication systems. The new Consolidated Network Communications Control Center would establish a modern and updated hub that will have a positive effect on infrastructure. Excavations for underground utility work would be coordinated through design reviews, individual project impact analysis identified through the AF 332 process, and the AF 103 process.

Transportation

Traffic levels may increase when a few construction/renovation/demolition projects are implemented in the same relative timeframe. The roadways leading to and on PAFB would be able to accommodate the anticipated level of traffic associated with construction equipment and employees; however, the increased levels may create congestion on the base during peak traffic periods. Long-term beneficial transportation impacts include gate reconfigurations to allow more direct routing and to ease existing congestion, and the planning and construction of pedestrian walkways throughout PAFB to reduce vehicle usage throughout daily operations as much as practical. Beneficial impacts are anticipated from these transportation improvements.

4.7.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur

in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation work would result for base maintenance purposes. No significant impacts to infrastructure and transportation are anticipated due to the No Action Alternative.

4.7.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This action would result in no changes to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for DEOMI would reduce the square footage of the addition. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. This action may result in the minor impacts to infrastructure and transportation similar to the proposed action, however, no significant impacts are anticipated with adherence to proper protocol for utility outages and traffic detours/re-routing.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. This action may result in the minor impacts to infrastructure and transportation similar to the proposed action, however, no significant impacts are anticipated because this area will

remain relatively semi-improved to unimproved with minimal infrastructure and only pedestrian foot traffic.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. Compared to the Proposed Action, this would result in similar impacts to infrastructure and transportation, however, no significant impacts are anticipated due to this alternative.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This action would result in no changes to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This action would result in no changes to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. This action would result in reduction of impacts to infrastructure and transportation, therefore no significant impacts are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.8 AICUZ and Land Use

4.8.1 Potential Impacts of the Proposed Action

This section focuses on the impacts to AICUZ and land use from implementation of the Proposed Action. The threshold level of significance for land use impact is the potential for the Proposed Action to change the land use in such a manner as to cause incompatibility with adjacent land management and/or uses.

There has been minimal off-base encroachment into the southern Accident Potential Zone (APZ) of Runway 02/20, according to a 2001 AICUZ Study. A civilian residential community on Tortoise Island was established during the mid 1990s that is partially within the Day-Night Average Sound Level (L_{dn}) 65-70 dB noise zone. This community was developed after the institution of the AICUZ in 1979, which detailed the recommended land use restrictions. However, the County government approved the housing in this area with the only restrictions being: 1) a declaration by deed to homeowners that the property lies within a noise and safety hazard zone; and 2) a requirement that home construction comply with noise attenuation standards. However, only a small segment of the development is impacted from noise. Refer to Section 4.8.7 for a discussion of other airfield land use issues.

PAFB's most significant constraint to further development on the installation is the almost "to capacity" development of the limited land area occupied by the base with such a large area occupied by the airfield. Although there are nearly 400 acres of 'Open Space' on the base, most of it is not available for construction, primarily due to locations in the 100-yr floodplain, requirements for storm water retention, and the general desire to retain 'Open Space' lands as a natural Quality of Life (QOL) amenity. Most of the 'Open Space' land that is available for development has been identified for locations of new facilities in ADPs. Operational constraints involve primarily the airfield Clear Zones and 45 SW IRP sites.

Applicable federal actions will be consistent with NOAA's federal consistency regulations at 15 CFR Part 930. Federal consistency is required for federal actions that are defined as federal activities, including any development projects (15 CFR Part 930, Subpart C). Subpart C regulations require that all federal activities and development projects be consistent to the maximum extent practicable with federally approved state Coastal Zone Management (CZM) programs. Activities will be reviewed to determine which directly affect the coastal zone of States with approved plans and provide a written "consistency determination" to the authorized state CZM agency for all activities directly affecting the state's coastal zone. In review of this EA through the Florida Clearinghouse, and as part of regulatory permitting processes in Florida, the Proposed Action has been deemed consistent with Florida's CZM program (Appendix D).

The most significant land use changes involve the relocation of 'Industrial' uses from the river community area to the Mid Base East Support area (ADP V), and the removal of structures from the Northern Clear Zone. These changes will not only bring PAFB into compliance with airfield criteria, they will also enhance QOL for base personnel. Implementation of the recommendations of the Area Development Plans are anticipated to enhance the working and living environment at PAFB, and are discussed below.

Area Development Plan I: North Base Residential

Effects from the Proposed Action are expected to be beneficial to land use of ADP I by enhancing the riverside trail, renovating visitor's quarters, and upgrading the beachfront recreation area to meet higher satisfaction criteria for QOL and fitness options as well as meet user demand.

Area Development Plan II: North Base Administration

Ground Safety and Flight Safety will need to evaluate designs for any new facilities in ADP II under the Proposed Action to ensure height and clear zone criteria are met before final site plan approvals. Due to limited funding for relocation of facilities in the CZ, it will not be economically feasible to remove all facilities within less than 20 years. Impacts from the Proposed Action would be beneficial to land use of ADP II by demolishing unneeded facilities, consolidating functions, and upgrading beachfront recreation areas to provide for more effective use of space as well as meet user demand (although elevated structures should not be built in the CZ that encompasses Main Gate Beach).

Area Development Plan III: Mid-Base River Industrial

The MBRI ADP seeks to maximize utilization of the airfield and land available for mission compatible, aviation-related operations. Base support facilities would be relocated and consolidated to ADP V to provide an improved operating environment for the 920 RQW campus. Non-aviation oriented mission compatible operations would also be relocated away from the airfield apron and out of MBRI when possible. Impacts from the Proposed Action would be beneficial to land use of ADP III by relocating and consolidating functions and reconfiguring stormwater systems to be more compatible with the 920 RQW mission and PAFB land use planning and provide for more effective use of space.

Area Development Plan IV: Mid-Base Military Recreational

The MBMR ADP includes expansion of FAMCAMP and reuse of a closed landfill for day use recreation and fitness. Some of the FAMCAMP expansion proposed on the far northern extent of the landfill could be compatible, however, constructed features such as large recreational facilities and retention swales that may require deep digging won't be approved by the EPA, FDEP and the 45 SW IRP if the landfill cap may be breached. Coordination with 45 CES Environmental would be required to ensure compliance with current land use controls. Additionally, the trail shouldn't be open for use at night because this brings the requirements for utilities and lighting and additional safety measures that result in impacts to the underlying landfill as well as more environmental impacts with unnecessary light pollution, energy waste, and removal of vegetation considered tripping hazards.

A tower with triangular fence is located in the northeast corner of the overflow area proposed for 22 new camping sites. Planning coordination must occur to determine if the tower can be relocated or the design will need to be reconfigured around the existing tower and fence which will reduce the number of developed camp sites with full hookups. Impacts from the Proposed Action would be beneficial to land use of ADP IV by expanding the FAMCAMP to meet user demand and providing more amenities to enhance QOL.

Area Development Plan V: Mid-Base East Support

Under the Proposed Action, the MBES development area would be utilized primarily for consolidation of base support functions. New facilities would be constructed to replace outdated facilities and consolidate functions such as the Fire Crash Rescue Station, Vehicle Maintenance Complex, and CE Complex. Impacts from the Proposed Action would be beneficial to land use of ADP V by demolishing unneeded facilities, consolidating functions, and upgrading beachfront recreation areas to provide for more effective use of space as well as meet user demand and improve QOL.

Area Development Plan VI: South Base Community Support

Under the Proposed Action, the SBCS development area would be utilized primarily for consolidation of community support such as retail, banking, medical services, recreational options, etc. New facilities would be constructed for food preparation and event management services and support amenities for the golf course and marina. Renovations would improve the marina and clubhouses. However, any marina work must consider that the western portion is located in the airfield CZ so no structures should be planned within this area. A seemingly incompatible land use in ADP VIb of the munitions storage area (11 bunkers) is actually compatible because Quantity-Distance (QD) arcs are established so buffers are developed based on the quantity and type of explosives, type of storage facility and risk factors, therefore no adverse impacts to land use are realized. Impacts from the Proposed Action would be beneficial to land use of ADP VI by providing improved service support to the base populace and retired military and upgrading the marina and beachfront recreation areas to meet user demand and improve QOL.

Airfield

Fifty-nine obstructions are within a 3000 ft x 3000 ft zone north of Runway 02-20 and all are waived by MAJCOM. Land uses with this ADP would change slightly by removing incompatible facilities to areas more consistent with their missions, and freeing space for missions directly related to aircraft operations. "Conservation" areas and designed "Administrative" space should not be located in CZs or APZs for compatibility with flight safety. Impacts from the Proposed Action would be beneficial to land use of the airfield by removing incompatible features, upgrading infrastructure and pavement/ramps to support flight operations.

South Housing

Under the proposed action, the former fire station would be demolished and restrooms for the soccer fields would be constructed. These actions are compatible with land use and AICUZ, therefore no adverse impacts to either are realized. Impacts from the Proposed Action would actually be beneficial to land use as improved service support to the active military base populace and their families would occur which would also assist with meeting user demand and improving QOL.

4.8.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation work would result for base maintenance purposes. The 45 SW Safety, 45 CES Environmental, and PAFB land use planners will review all project designs and specifications to ensure compatibility with base land use planning, and AICUZ criteria. Some incompatibly would remain as facilities are retained in the Clear Zone, however, no significant impacts are anticipated with waiver approvals and maintenance of these facilities on the demolition list so they can be removed when they reach the end of their sustainable life expectancy. No significant impacts to AICUZ and land use are anticipated due to the No Action Alternative.

4.8.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. This action would result in no changes to AICUZ and land use. To prevent incompatible use, however, construction in the Clear Zone should not violate AICUZ criteria. No significant impacts are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for DEOMI would reduce the square footage of the addition. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. Land use would change similar to the GP with conversion of 'Industrial' classification for the firing range to 'Recreational' after the site is cleared and restored. This action would result in no impacts to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. This action would result in no impacts to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. Some areas behind 1360 and 1350 are maintained grass areas considered 'Open Space' so would be converted to 'Industrial.' This action would result in no impacts to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. This action may result in the minor impacts to AICUZ and land use similar to the proposed action should facilities be retained in the Clear Zone or Q-D arcs limit aviation-related development, however, no significant impacts are anticipated with waiver approvals and retaining of these facilities on the demolition list for removal when they reach the end of their sustainable life expectancy.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. Some maintained grass area considered 'Open Space' would be converted to 'Community Support.' This action would result in no impacts to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. This action would result in no changes to AICUZ and land use, therefore no significant impacts are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.9 Water Resources

4.9.1 Potential Impacts of the Proposed Action

Water resources could potentially be affected by the Proposed Action activities if soil erosion occurs from land disturbance during construction activities. Prior to and during such activities, erosion and sediment control measures would be designed and implemented to retain sediment on-site and prevent violations of State and Federal water quality standards through siltation fences or other BMPs such as National Pollutant Discharge Elimination System (NPDES) monitoring. In addition, the contractor must implement BMPs as necessary and correct any erosion or shoaling causing adverse impacts to water resources. No significant impacts are anticipated to water resources.

Environmental Resource Permits (ERP), Potable Water Permits, FDEP Construction General Permits, and Domestic Wastewater Permits will be obtained for all construction activities that meet development thresholds. Public water system permits will be obtained for all applicable modifications or construction to drinking water infrastructure including water mains. An ERP serves as multi-purpose permit that covers alteration of uplands, Florida Coastal Zone Management and water quality certification requirements (if a Clean Water Act (CWA) Section 404 permit is required for dredge and fill activities). ERPs will be reviewed jointly by U.S. Army Corps of Engineers, FDEP and local water districts, and all established permit conditions will be integrated into project design and construction. An ERP will be coordinated through FDEP for coastal development activities east of SRA1A. For projects that require a Notice of Intent for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit, the package shall be submitted to FDEP through 45 CES Environmental. When all construction activities have been completed, a Notice of Termination shall be submitted to FDEP through 45 CES Environmental. Per Section 438 of the *Energy Independence Security Act*, post-development hydrologic stormwater discharge for activities affecting greater than 5,000 sq ft will meet pre-development discharge (no net increase in discharge). Additionally, low impact development processes shall be considered to minimize impacts of stormwater discharge and reduce TMDLs to the Banana River, the stormwater receiving waters for PAFB. Additionally, during repair, construction, or maintenance activities at PAFB, the conditions for the Municipal Separate Storm Sewer System (MS4) Permit shall be implemented along with best management practices activities to minimize impacts of stormwater discharge.

Dewatering activities associated with Proposed Action activities will obtain a Consumptive Use Permit per FAC Chapter 40C-2 when:

- The project proposes to withdraw water from a well that measures six inches or more in diameter.
- The project will use or wants to use an annual average of 100,000 gallons of water or more per day.
- The project has the capacity to pump one million gallons of water or more per day.

Effluent from dewatering activities will be discharged to an upland area, not to surface waters.

An exact amount of new impervious is not available, but an approximation based on planning data is 615,569 square feet. Likewise, several demolition and stormwater management re-configuration projects are proposed that will reduce impervious surfaces by about 98,134 square feet. Drainage from impervious surfaces would be controlled using grading, curbs, drains, gutters, and other standard construction and post-construction stormwater controls designed to prevent offsite impacts from stormwater runoff. Construction and paving associated with the proposed improvement projects could result in slightly fewer acres available to facilitate groundwater recharge, but the impact would not be significantly adverse as other areas would be converted to maintained grasses (recharge areas) after demolition.

In terms of water resources, the analysis focuses on potential effects on water use, availability and quality, and potential impacts to the hydrologic setting or water sources. A significant impact on water resources would (a) violate water quality standards; (b) substantially deplete groundwater supplies or interfere substantially with groundwater recharge; or (c) otherwise substantially degrade water quality.

Stormwater runoff from industrial facilities, parking lots, and roadways is the primary cause of non-point source pollution at PAFB. The Proposed Action includes paving and construction of buildings and walkways with impervious surfacing. As such, the Proposed Action provides an opportunity to design runoff treatment measures that help ensure nutrient Total Maximum Daily Loads (TMDLs) are met for the Banana River Lagoon watershed. The potential for stormwater non-point source pollution at PAFB is typically minimized by storage and treatment of runoff in retention ponds and swales, and BMPs to reduce exposure of potential contaminants to stormwater such as petroleum products (oils and grease) from asphalt surfaces and other hazardous materials and wastes from outdoor storage yards and work areas that may discharge to surface waters during an intense rainfall. The 45 SW is coordinating with FDEP and Brevard County to work cooperatively on TMDL implementation, and will obtain all necessary permits related to water quality regulations. No significant impacts to water resources from proposed action activities are anticipated.

4.9.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur

in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation work would result for base maintenance purposes. The 45 CES Environmental will review all project repair and maintenance designs and specifications under the No Action Alternative to ensure proper permitting is occurring and water quality impacts are being avoided or reduced to prevent significant impacts to water resources.

4.9.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This action would result in beneficial effects to water resources by reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 1 for DEOMI would reduce the square footage of the addition. This action would result in beneficial effects to water resources by reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. This action would result in beneficial effects to water resources by maintaining space for

water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. Some areas behind 1360 and 1350 are maintained grass areas considered 'Open Space' so would be converted to 'Industrial.' This action would result in minor impacts to water resources by increasing impervious area, eliminating recharge capacity and creating the need for stormwater treatment, however, no significant impacts are anticipated due to this alternative with adherence to stormwater management requirements through permitting conditions and BMPs.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. This action would result in a very small beneficial effect to water resources by creating space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. Some maintained grass area considered 'Open Space' would be converted to 'Community Support.' This action would result in no significant impacts to water resources, and would have a similar minor level of impact as compared to the proposed action.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This action would result in beneficial effects to water resources by reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. This action would result in beneficial effects to water resources by maintaining space for water recharge and reducing stormwater treatment requirements, therefore no significant adverse impacts are anticipated due to this alternative.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.10 Socioeconomics

4.10.1 Potential Impacts of the Proposed Action

Socioeconomics comprise such interrelated resources as population, employment, income, temporary living quarters (during construction activities), and public finance. It is not anticipated that the Proposed Action will affect employment patterns on a permanent basis or induce substantial growth or growth-related impacts. Under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, Federal agencies must analyze environmental effects such as human health, economic and social effects on low-income and minority populations, and mitigate significant effects to these communities. Proposed Action areas are not located adjacent to minority populations or low-income population centers. No significant impacts to socioeconomics are anticipated from the Proposed Action.

4.10.2 Potential Impacts of the No Action Alternative

Under the No Action Alternative existing facilities, infrastructure and grounds at PAFB would be maintained, and no consolidation, demolition or construction of new facilities would occur in support of changing operational requirements as envisioned in the PAFB General Plan. Small scale repair and renovation work would result for base maintenance purposes. No socioeconomic impacts are anticipated due to the No Action Alternative.

4.10.3 Potential Impacts of Other Alternatives

ADP I: North Base Housing

Alternative 1 for Picnic Tables Beach considered a reduction in the number of lookout pavilions (keep 1), removal of construction of new bathrooms to the south as well as the rental/concession facility. This action would result in no impacts to socioeconomics.

ADP II: North Base Administrative

Alternative 1 for Beachhouse Beach was to eliminate the pavilion and bathrooms proposed on the south end of the existing parking lot. This action would result in no impacts to socioeconomics.

Alternative 1 for Main Gate Beach was to only install one new crossover and two lookout platforms. This action would result in no impacts to socioeconomics.

Alternative 1 for the dorms was to renovate the existing buildings and not add-on to them or construct new ones. This action would result in no impacts to socioeconomics.

Alternative 1 for DEOMI would reduce the square footage of the addition. This action would result in no impacts to socioeconomics.

ADP III: Mid Base River Industrial

No alternatives were carried forward for analyses.

ADP IV: Mid Base Military Recreational

Alternative 1 for FamCamp was to limit expansion and reuse Facility 1657 as a community center once the outdoor firing range is demolished and the site is cleaned up and restored. This action would result in no impacts to socioeconomics.

Alternative 2 for FamCamp and the recreational trail was to limit expansion of the day-use fitness/recreational trail complex proposed on the closed landfill adjacent to FAMCAMP. This action would result in no impacts to socioeconomics.

ADP V: Mid Base East Support

Alternative 1 for Hangars Beach was to limit construction to one crossover and one lookout pavilion. This action would result in no impacts to socioeconomics.

Alternative 1 for the Vehicle Maintenance Complex was to extensively renovate Facility 313 to facilitate modern vehicle maintenance instead of constructing a new facility. This action would result in no impacts to socioeconomics.

Alternative 1 for CE consolidation was to use the area behind Facility 1360 and the Electric Shop (1350) instead of demolition and new construction near the new proposed Vehicle Maintenance Complex. This action would result in no impacts to socioeconomics.

Alternative 1 for inert storage was to only demolish inert munitions storage facility 1322. This action would result in no impacts to socioeconomics.

ADP VI: South Base Community Support (including Golf Course and Marina)

Alternative 1 for a food preparation and catering facility was to construct it near the Dining Hall instead of in ADP VI. This action would result in no impacts to socioeconomics.

Alternative 1 for the Tire Center was to develop it in the BX instead of as an addition to 1360. This action would result in no impacts to socioeconomics..

Alternative 1 for Pineda Beach was to reduce the amount of new construction proposed to the north of the existing parking lot and beach amenities to a small parking lot expansion, one crossover and two lookout pavilions. This action would result in no impacts to socioeconomics.

Airfield

No alternatives were carried forward for analyses.

South Housing

No alternatives were carried forward for analyses.

4.11 Conflicts with Federal, State, or Local Land Use Plans, Policies, and Controls

The Proposed Action would have beneficial impacts on existing PAFB land use and present no conflicts with Federal, regional, state, or local land use plans, policies, or controls.

4.12 Energy Requirements and Conservation Potential

Federal agencies are required to reduce energy consumption by 2% each year under the Energy Policy Act (Public Law 109-58, Aug 8, 2005). Projects will incorporate energy efficient appliances and products identified under the Energy Star labeling or designated under the Federal Energy Management Program (FEMP) of the Department of Energy as being among the highest 25% of equivalent products for energy efficiency unless it is not cost-effective over the life of the product taking energy cost savings into account or there are no products that meet the functional requirements of the agency.

EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, requires improved energy efficiency and reduced greenhouse gas emission through an annual 3% reduction in energy consumption, and an annual 2% reduction in water consumption. Per the National Energy Conservation Policy Act, sustainable design principles and life-cycle cost-effective technologies will be applied to siting, design, and construction of all new and replacement buildings. Existing energy sources are considered adequate to meet the requirements of the Proposed Action.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, expands on EO 13423 for energy reduction and environmental performance standards for Federal agencies. An integrated strategy for sustainability is anticipated with a priority of reduction of greenhouse gas emissions. Energy usage and alternative energy sources should be identified in National Environmental Policy Act documents. Sustainable Federal building design, construction, operation and management, maintenance, and demolition must be implemented beginning in 2020 to ensure new Federal buildings are designed to achieve zero-net-energy by 2030. At least 15% of existing buildings (greater than 5,000 sq

ft) must meet the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings* by fiscal year 2015, and make annual progress toward 100% conformance with the *Guiding Principles* for its building inventory by pursuing minimization of consumption of water, energy and materials, identifying alternatives to renovation to reduce existing assets' deferred maintenance costs, identifying ways to consolidate and dispose of real property assets, and ensuring historic buildings utilize technology to retrofit functions to promote long-term viability. A minimum of a 20% reduction of indoor potable water compared to the baseline, and 50% reduction of outdoor potable water compared to consumption by conventional means is required. The Proposed Actions identified through the General Plan were developed using these *Guiding Principles*. Future proposed actions center around consolidating functions and removing assets to reduce costs based on viable sustainability of the facilities.

4.13 Natural or Depletable Resource Requirements and Conservation Potential

Other than the use of fuel for demolition, construction/renovation activities and backup generator use, the Proposed Action requires no significant use of natural or depletable resources.

4.14 Irreversible or Irrecoverable Commitment of Resources

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irrecoverable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a T&E species or the disturbance of a cultural resource).

For the General Plan proposed actions, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or long lasting but negligible. Those limited resources that may involve a possible irreversible or irretrievable commitment under the Proposed Action are discussed below.

Facilities construction and maintenance for support activities would require consumption of limited quantities of aggregate, steel, concrete, petroleum, oil, and lubricants. Construction would generally occur on previously disturbed areas or in areas lacking significant habitat or concentrations of wildlife, so no irreversible loss of habitat and wildlife would result. Any renovation or demolition activities proposed for historic and eligible facilities will require concurrence from the State Historic Preservation Officer (SHPO) in accordance with 36 CFR Part 60. While construction of new facilities on PAFB would incur some soil disturbance and loss, measures to localize and minimize soil loss would be implemented. The AF would continue to comply with requirements of the USFWS Biological Opinions (BOs) to minimize T&E mortality, harassment, or habitat destruction.

Vehicle use by those supporting General Plan activities would consume fuel, oil, and lubricants. The amount of these materials may exceed that currently used because of the increase in the number of larger projects proposed in the next five years compared to the last five years. Construction in the region would occur regardless of the specific location, and fuels will be expended. The projects identified in the General Plan will be designed to assist in curtailing high energy consumption. In the long-term, non-renewable energy used for the projects should be offset by energy and resource saving measures in design and construction materials and processes.

4.15 Adverse Environmental Effects that Cannot be Avoided

Adverse environmental effects from the Proposed Action that cannot be avoided include construction-related emissions of fugitive dust and exhaust products; temporary displacement of wildlife during construction due to noise and construction activities; some destruction of existing vegetation; and sediment runoff into surrounding areas during construction activities. However, through implementation of the best management practices and measures described within this document, these effects are anticipated to have a less than significant impact on environmental resources.

4.16 Relationship Between Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

The Proposed Action activities establish an updated plan to maximize the utilization and capability of assets, existing and proposed, to meet the mission while maintaining sensitivity to its operational and physical impact. The short-term impacts described in this document will result in a more organized and logically developed base that has reduced sustainment costs, pedestrian friendly environments, and improved operational efficiencies providing long-term productivity.

4.17 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Based on preliminary guidance provided by the Federal Interagency Working Group on Environmental Justice, adverse may be defined as "having a deleterious effect on human health or the environment that is significant, unacceptable, or above generally accepted norms." Adverse human health effects include bodily impairment, infirmity, illness, or death. Adverse environmental effects may include ecological, cultural, human health, economic, or social impacts when interrelated to impacts on the natural or physical environment.

The Proposed Action area is not located adjacent to minority populations or low-income population centers, and indirect impacts to such communities located in the surrounding areas were not identified during the analysis of the Proposed Action. Census data for

Brevard County and surrounding counties is provided in Table 4-6. Proposed Action activities are not anticipated to produce excessive pollution or create a hazardous situation that would affect the surrounding community, regardless of economic background. Therefore, it is concluded that the Proposed Action would not result in disproportionately high or adverse human health or environmental effects on minority or low-income populations. Neither Other Alternatives nor the No Action Alternative would substantially affect human health or the environment and would not exclude persons from participation in projects, deny benefits, or subject persons to discrimination because of their race, color, or national origin. In accordance with EO 12898, the public will have the opportunity to review this EA and comment on its actions accordingly.

Table 4-6: Census Data Comparison for Brevard and Surrounding Counties (2007)

Statistics (%)	Brevard	Indian River	Orange	Osceola	Volusia
White persons	85.9	88.9	72.3	82.8	86.5
Black persons	10.0	8.8	20.8	11.3	10.5
American Indian and Alaska Native persons	0.4	0.3	0.5	0.7	0.4
Asian persons	2.0	1.0	4.4	3.2	1.5
Native Hawaiian and other Pacific Islander persons	0.1	0.0	0.2	0.2	0.0
Hispanics or Latino origin persons ¹	6.9	9.8	24.3	40.5	10.3
Persons below poverty	8.6	9.7	11.6	11.2	14.1

¹Hispanics may be of any race and are also included in applicable race categories.

Source: U.S. Census Bureau, www.census.gov

4.18 Cumulative Impacts Summary

Cumulative impact as shown in 40 CFR 1508.7 is "...the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Potential cumulative impacts of the proposed project activities are evaluated by determining (1) whether the Proposed Action would have an impact on a given resource and (2) what is the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions.

The AF and PAFB have developed extensive programs and plans to address environmental and cultural issues that are associated with the base. The general goals and objectives for the installation, as outlined in the PAFB General Plan, ensure that environmental impacts are reduced or eliminated. However, future individual actions may still require detailed environmental analysis and recommendations of feasible alternatives prior to construction and/or implementation especially if scope changes result in impacts to protected resources. The Environmental Management System (EMS) is also working to integrate environmental considerations into all operations and procedures to provide more environmentally safe practices that limit liabilities and potential damage.

A PAFB Installation Encroachment Management Action Plan has also been developed to identify any actions that impair or are likely to impair the current or future operational capability of PAFB, or have or are likely to have a significant adverse effect on nearby communities. The forms of encroachment that have been identified for analysis include: airborne noise, air and land space restrictions, air quality, water resources, cultural resources, endangered species habitat, frequency encroachment, maritime sustainability, urban growth, wetlands, renewable energy development, unexploded ordnance, internal encroachment and climate change. These results will further aid PAFB in effective comprehensive planning to include working with local governments for regional compatibility.

Most of the PAFB General Plan Proposed Action activities will occur in areas that have been previously disturbed. Many of these projects consist of minor improvements, repairs and maintenance projects that represent routine activities as classified under 32 CFR Part 989, and result in negligible effects to the environment (refer to Appendix A). However, several proposed projects would involve new construction, expansion, or demolition of facilities and infrastructure. Because the projects aim to consolidate functions and site facilities where similar activities and functions have and will continue to occur, no significant impacts to the proposed development areas are anticipated. Some Proposed Action projects are programmed to correct land use incompatibilities, as the General Plan goal is to provide appropriate land use functions on PAFB that will be harmoniously located and functionally efficient, thus creating a positive cumulative impact.

Energy and water conservation, recycling, and/or habitat conservation considerations will be incorporated into most of the proposed projects to comply with various EOs, regulations, and initiatives. Some are specifically designed to improve the environment (invasive vegetation removal), while others would utilize environmentally friendly systems such as higher efficiency HVAC systems (energy conservation), energy controls, and water conserving faucets. Cumulative contributions of non-recyclable construction debris to the CCAFS and Brevard County landfill would occur from demolition activities. However, this debris would not be considered a significant impact to landfill capacity over the course of five years. No significant cumulative impacts to human health or the environment are anticipated if designs are wisely developed and coordinated with all appropriate external and internal agencies.

Cumulative impacts from multiple actions occurring simultaneously on PAFB include air emissions from construction and mission-related functions. Refer to Section 3.1 and 4.1 for NAAQS requirements, air monitoring data and cumulative projected air emissions related to General Plan actions. While cumulative emissions would exceed the minimal quantities

generated by the individual projects identified in the Proposed Action, they would not pose a conformity problem under the CAA. PAFB's designation as a major source of criteria air pollutants permits emitting greater than 100 tpy of Particulate Matter (PM), however, emissions of PM should be below 250 tpy. In 2008 PAFB was not a major source of HAP but was a major source for the criteria air pollutant PM with slight exceedence over the 100 tpy threshold, but fell below the total synthetic minor thresholds for total HAPs emission thresholds (22 tpy) and individual HAP (8 tpy). In 2009, PAFB has the same results as 2008 as recorded within the air emissions inventory. Then in 2010, PAFB was not a major source for HAP nor any of the criteria air pollutants and remained under the 100 tpy threshold. PAFB has remained below the synthetic minor thresholds for total HAPs and individual HAP since 1997.

Future projections of emissions for stationary sources may fluctuate depending on activities performed by various organizations from CE to tenants such as 920 RQW, Department of State, AAFES, etc. Paint spray booths and storage tanks are not projected to increase, however operations may, thus increasing potential VOC emissions. Air inventory data will continue to be collected, emissions monitored and operations changed if necessary to prevent significant cumulative impacts to air quality. As for mobile sources of air pollutants, proposed action activities and other foreseeable future projects within the following discussion cover five years. In 2012, one large construction project and three small construction/demolition projects are projected (AFTAC, airfield pavement demolition, Picnic Tables expansion and Beachhouse club expansion). In 2013, two large construction and nine small construction/demolition projects are projected (AFTAC, Main Gate relocation, marina dock replacement, airfield paving and lighting upgrades, and demolition of 557, 407, 408, 739, 1322, 1327, and 1330). In 2014, two large construction and five small construction/demolition projects are projected (AFTAC, 920 RQW campus development, FamCamp expansion, Pineda Beach expansion, and demolition of 515, 523, and 524). In 2015, one large construction and six small construction/demolition projects are projected (AFTAC, beach rental/snack bar Picnic Tables, 1360 expansion, South Housing soccer field restrooms, and demolition of 1425, 1432, and 1435). In 2016, two large construction and six small construction/demolition projects are projected (Fire Crash Rescue Station, Consolidated Network Communications Control Center, 1060 expansion, Golf Course Clubhouse expansion, fuel tank replacement, and demolition of 1427, 1440 and 3650). Finally, in 2017, two large construction and ten small construction/demolition projects are projected (CE Complex, DEOMI expansion, Marina Clubhouse expansion, Department of State warehouse, demolition of 810, 533, 559, 560, 960, 912, 1968, and 980). In review of Tables 4.1 to 4.4, annual potential emissions related to construction and demolition using the proposed actions' projections of a maximum of two large construction projects and ten small construction/demolition projects per year fall below the 250 tpy threshold per any one of the criteria pollutants, and PSD requirements should not be triggered. No significant cumulative impacts to air quality are anticipated regionally.

On a global basis, the limited amount of emissions associated with projects identified in the Proposed Action would not contribute significantly to cumulative global warming or stratospheric ozone depletion; however, any emissions of ozone-depleting substances and GHG represent an incremental increase that would add to air emissions being released to the global atmosphere. No significant cumulative impacts to air quality are anticipated globally due to PAFB implementation of the General Plan.

The cumulative impacts that may occur as a result of the new construction and renovation work will include consolidation of development to functional areas which may increase lighting in specific ADPs. ADPs II, V, and VI will see the most change in five years unless budget cuts result in project de-prioritization and deletions. As long as light management requirements continue to be followed in accordance with the ESA, USFWS BO, and 45 SWI 32-7001, and incidental take due to sea turtle disorientations is not exceeded, then no significant adverse cumulative effect to protected sea turtles is expected (Appendix B). No significant adverse cumulative impacts are anticipated for manatee, wood stork, indigo snake, gopher tortoise, least tern or black skimmer (Appendix B). Impacts to each of these species will be temporary and intermittently spaced over five years so each will have the ability to use alternative resting, foraging, and potential nesting locations either at a different location on PAFB outside of the small area being disturbed or at the numerous higher quality habitat locations throughout Brevard County. Past impacts to biological resources have included: Atlantic Ocean dredging activities for PAFB beach restoration; depredation of birds for BASH reduction and safety; lighting impacts due to night construction and operational lighting for safety, security and night training requirements; public dog walking on PAFB beach that has caused destruction of sea turtle nests; mowing impacts to ground nesting animals; disturbance of roof nesting birds; construction and demolition noise impacts; and vegetation removal from canals and around buildings. These past impacts have the likelihood to occur in the present and in the future, however, most are reduced through best management practices with natural resource training, contract language, inspections and corrections. It is assumed that there will be no significant changes in impacts over time unless new more stringent regulations are developed or new species or habitat are listed under the ESA.

Reasonably foreseeable future development activities will probably put more pressure on construction in the 100-year floodplain as 'Open Space' areas outside of the floodplain are developed over the years. The 45 SW would continue to define alternative locations for construction outside of the 100-yr floodplain unless no other practicable alternatives exist, and then measures to minimize harm to or within the floodplain will be implemented. Structures in the 100-year floodplain will incorporate floodproofing measures per EO 11988 to reduce loss of property and life. Fill materials will be added to the building footprint where necessary to raise the building above flood elevations designated on FEMA/FIRM maps, and other structures will be elevated on pilings/stilts adjacent to Atlantic Ocean beaches to reduce impedance of floodwaters as they are able to pass under the structures. Existing structures in the 100-yr floodplain have sustained damage along the Atlantic Ocean and the Banana River after hurricanes and tropical storms because of rising floodwaters, velocity surge and sand movement inland beyond the dune. Past damage required facility repairs, although this type of damage has only occurred a couple times in 10 years. If storm intensity or frequency increases in the future as predicted with weather pattern and ocean circulation changes then more emphasis must be placed on avoiding or even removing existing development in the floodplain to prevent severe damage or loss of property. Cumulative impacts associated with construction in the 100-yr floodplain are not anticipated to significantly alter the 100-year floodplain's flood water management characteristics. If wetland impacts are a potential due to scope changes of General Plan actions then separate environmental impact analyses will be accomplished to ascertain if significant adverse effects and cumulative impacts will be realized.

In addition to past, present and future, small construction impacts along the dune for beach amenity and QOL enhancements, natural disturbances causing erosion, and daily human disturbances caused by beach users, pets, artificial lighting, and predators may decrease nesting/foraging success and modify fledgling or hatchling (birds and sea turtles) behaviors and survivability. The amount and intensity of disturbances will determine if wildlife behavior modification and displacement from preferred nesting/foraging areas will be temporary or permanent. Past lighting impacts (prior to the 1990s) were significant, however, light management strategies have significantly reduced impacts and impacts are anticipated to remain minor even with increased number of lights because new technologies are becoming more dark sky friendly. Construction work almost entirely behind the dune is not anticipated to result in cumulative impacts to habitat quality, but would result in some native vegetation losses. Educating the public of conservation measures they can take through beach access signs, the use of dune crossovers instead of creating their own paths over the dune, pamphlets, and internet sources should reduce human disturbance occurrences, but there is still a proportion of the public that won't make the effort to be responsible. There will be some small cumulative impacts to dune vegetation with small areas of removal and human beachgoer disturbance.

As facilities are constructed, greater amounts of impervious surfaces will be created for buildings and parking which will lead to requirements for improved retention and stormwater treatment for the increased runoff. Refer to above discussions of air quality cumulative impacts for a listing of larger proposed projects over the next five years. Old pavement and buildings will be demolished which will reduce some runoff, however, an increase in total impervious surface on PAFB is expected in the next five years (see Sections 4.7 and 4.9). In combination with regional runoff in the Banana River watershed with off-base development, the PAFB runoff discharges aren't anticipated to create significant cumulative impacts to water quality. In the past the Banana River was severely degraded due to septic tank loading, extensive runoff and direct discharges of wastewaters. Currently, the Banana River is still considered impaired but improvements have been made with removal of septic tanks, conversion to sewer systems, and more stringent stormwater retention treatment requirements. In the present and into the future, the Total Maximum Daily Load (TMDL) discharge reduction requirements will require a look at allotments and limits throughout Brevard County which will require a cumulative analysis decision-making approach to improve water quality regionally. Likewise, low impact development can be incorporated into present and future project designs such as using semi-permeable materials and percolation systems instead of pipe drainage to outfalls to limit storm water runoff.

Cumulatively adverse impacts will be occurring to potentially eligible historic resources at PAFB as Air Force goals require reduction of buildings to cost costs and improve efficiencies with consolidation. Only eligible facilities proposed for demolition in the High Explosive Magazine and Inert Storage Facility Historic Districts have been considered adequately mitigated by the SHPO (Appendix C). Cumulative impact analyses will occur in a separate NEPA document covering potentially eligible facilities proposed either for demolition or extensive renovations in the PAFB GP once determinations have been made by SHPO and the ACHP as to appropriate mitigation after case studies covering all alternatives that may avoid or minimize impacts to cultural resources are reviewed. Refer also to Section 4.3 and Appendix C for the listing of facilities that SHPO has determined are not eligible that are planned for demolition.

The greatest cumulative impacts anticipated are to geology and soils with ground disturbance and to air quality with increased air pollutants as several proposed projects are occurring in the same year through the five year period. As compared to the last three years (beginning in 2009), the next five years seem comparable in development as PAFB received a significant amount of stimulus dollars that went toward infrastructure upgrades, repair and construction. However, based on projections of Department of Defense budget and fiscal spending cuts, it is anticipated that a fair number of projects planned through the General Plan will go unfunded. The relatively small footprint of impacts (PAFB is only a little more than 2,000 acres), short-duration for projects, and expected recovery from construction effects leads to the determination that the Proposed Action will contribute a small, but negligible incremental effect to cumulative impacts when added to the impacts of other past, present and reasonably foreseeable actions affecting PAFB property.

5.0 Conclusion

The AF assessed the potential environmental consequences of implementing the PAFB General Plan and its associated projects on PAFB property within the next five years. The Proposed Action, No Action Alternative, and reasonable Alternatives to the Proposed Action were analyzed. Proposed action projects are necessary to provide for consolidation and disposal of real property assets to defer maintenance costs, to focus infrastructure on sustainability and long-term viability, to use new technologies for minimization of consumption of water, energy and materials, and promote benefits to health and welfare. The No Action Alternative did not meet the selection standards or the purpose and need of the projects proposed in the next five years. The Alternatives analyzed resulted in varying degrees of beneficial to minor effects, but overall did not meet all the selection standards as provided with implementation of the General Plan.

No significant environmental impacts were identified that would require the completion of an Environmental Impact Statement. However, some less than significant impacts were identified and are summarized below in Table 5-1, along with minimization measures and applicable regulatory guidance.

The 45 CES Environmental shall be notified of future designs, pre-construction, construction and post-construction meetings to monitor compliance with the environmental stipulations.

Table 5-1: Environmental Assessment Summary Matrix

Resource Category	Potential/Known Impact(s)	Impact Minimization Measure(s) and Applicable Guidance
Air Quality	Short term impacts to air quality from particulate matter, CO, SO ₂ and NO _x Potential releases of Ozone Depleting Substance (ODS)	Periodically water construction sites and restrict vehicle speeds for dust control. Properly remove ODS.
Biological Resources	Artificial lighting impacts to sea turtles Potential temporary disturbance of birds protected by the Migratory Bird Treaty Act (MBTA) and ESA	Coordination with 45 SW Asset Management/ CES Environmental and the USFWS; compliance with 45 SWI 32-7001 Relocate nests/eggs in accordance with the Federal Depredation Permit.
Cultural Resources	Demolition of potentially eligible historic structures Discovery of archeological resources	Provide SHPO with historic facility surveys and case study documentation Cease project activities if artifacts are unearthed and notify archeologist (45 SW CRM).

<p>Geology and Soils</p>	<p>Potential Disturbance of areas contaminated with hazardous waste resulting in greater dispersal of contaminants</p> <p>Soil erosion</p>	<p>Coordinate with 45 SW Installation (IRP) office</p> <p>Use BMPs to prevent erosion and stabilize the area with sod or seed after disturbance has ceased</p>
<p>Hazardous Materials and Waste</p>	<p>Hazardous Materials usage; Exposure to LBP, ACM, and PCBs</p> <p>Disposal of Hazardous Wastes</p>	<p>Develop HMMP for new facilities; Implement BMPs for LBP and PCBs; Submit Asbestos Abatement Plan</p> <p>Dispose hazardous wastes in accordance with 45 SW Management Plan 19-14.</p>
<p>Safety and Health</p>	<p>Worker Safety Issues</p> <p>Safety issues regarding handling, transporting, and disposing of hazardous materials and wastes (PCBs, asbestos, LBP, fuel, etc.)</p> <p>Chemical handling and venting of lab emissions</p> <p>Height restrictions for flight safety</p> <p>Short-term noise impacts to workers and surrounding personnel</p>	<p>Prepare Safety Plan, Hazard Communication</p> <p>Submit building plans to Security and Ground Safety, Flight Safety for approval</p> <p>Use administrative or engineering controls and PPE where necessary</p>
<p>Infrastructure and Transportation</p>	<p>Potential damage to underground utilities from heavy equipment</p> <p>Impacts to landfills from demolition debris</p> <p>Impacts to SR AIA traffic flow or FDOT facilities</p>	<p>Obtain dig permit prior to ground disturbance.</p> <p>Recycle wood, metals, concrete, and other materials whenever possible.</p> <p>Coordination with Florida Department Of Transportation and obtain required FDOT permits</p>
<p>AICUZ and Land Use</p>	<p>CZMA compliance</p>	<p>Provide Federal consistency review and obtain FDEP determination.</p>
<p>Water Resources</p>	<p>Soil erosion, siltation and pollution of surface waters</p>	<p>Obtain and comply with stormwater NPDES permit for activities that disturb 1 acre or more; implement BMPs.</p>

6.0 DOCUMENTATION CITED

- 32 CFR 989, 2003. *Environmental Impact Analysis Process (EIAP)*. Headquarters USAF. Washington D.C.
- AFI 32-7064, 2004. *Integrated Natural Resources Management*, Headquarters USAF. Washington D.C., 17 Sept.
- Department of Defense, 2003. *Unified Facilities Criteria, DoD Minimum Antiterrorism Standards for Buildings*, 8 October.
- Endangered Species Act, 1973. Pub. L. No.93-205, 81 Stat. 884 (Dec. 28, 1973) (current version at 16 USC. 1531-1543 (1982)).
- Executive Order 13112, 1999. *Invasive Species*.
- Executive Order 11990, 1977. *Protection of Wetlands*.
- Executive Order 11988, 1977. *Floodplain Management*.
- Hulstead, Wilford M. 1981. Cultural Resource Staff Visit Report Eastern Space and Missile Center. Report on file, Florida Division of Historical Resources. Tallahassee, FL.
- SpecPro, Inc. 2003. *45th Space Wing Historical Buildings Survey, Patrick AFB, Florida*. Prepared for the U.S. Air Force, 45th Space Wing. Patrick Air Force Base, FL.
- United States Air Force (USAF), 2011. *Update and Revision of Historic Properties Surveys Patrick Air Force Base, Brevard County, FL*. U.S. Air Force, 45th Space Wing. Patrick Air Force Base, FL.
- USAF, 2011. *2010 Air Emissions Inventory, Patrick AFB*, October 2011.
- USAF, 2010. *2009 Air Emissions Inventory, Patrick AFB*, August 2010.
- USAF, 2009. *Integrated Natural Resources Management Plan, Cape Canaveral Air Force Station, Florida*. U.S. Air Force, 45th Space Wing. Cape Canaveral Air Force Station, FL.
- USAF, 2009. *2008 Air Emissions Inventory, Patrick AFB*, September 2009.
- USAF, 2008. *Nellis and Creech AFBs Capital Improvements Program Environmental Assessment*, September 2008.
- USAF, 2007. *A Historic Properties Survey of the Inert Storage Facilities, Patrick AFB, Brevard County, FL*. U.S. Air Force, 45th Space Wing. Patrick Air Force Base, FL.
- USAF, 2007. *A Historic Properties Survey of the High Explosive Storage Magazines, Patrick AFB, Brevard County, FL*. U.S. Air Force, 45th Space Wing. Patrick Air Force Base, FL.

- USAF, 2005. *Environmental Assessment for the General Plan and Maintenance of Patrick AFB, FL.*, May 2005.
- USAF, 2004. *Invasive Plant Species Control Plan for PAFB, 2004*
- U.S. Army, 1994. *Historical and Architectural Documentation Reports of Patrick Air Force Base, Cocoa Beach, Florida.* U.S. Army Construction Engineering Research Laboratory, Tri-Services, Cultural Resource Research Center, Champaign, Illinois.
- United States Department of Agriculture (USDA), 1974. *Soil Survey of Brevard County, Florida.* USDA, Soil Conservation Service, in cooperation with the University of Florida Agricultural Experiment Stations. Horace Huckle, Hershel Dollar, and Robert Pendleton. USDA, Washington, D.C. 20250.
- United States Environmental Protection Agency (USEPA), 2011. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009.* EPA 430-R-11-005, April 2011.
- USEPA, 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, NJID, 300 1, December 31, 1971.
- U.S. Fish and Wildlife Service (USFWS). 2001. *Florida Manatee Recovery Plan (Trichechus manatus latirostris)*, Third Revision. U.S. Fish and Wildlife Service. Atlanta, Georgia. 144 p. + appendices.
- USFWS. 1996. *Revised Recovery Plan for the U.S. Breeding Population of the Wood Stork*, U.S. Fish and Wildlife Service. Atlanta, Georgia. 40 pp.
- USFWS. 1999. *South Florida Multi-Species Recovery Plan for the Threatened and Endangered Species.* U.S. Fish and Wildlife Service. Vero Beach, FL.
- USFWS. 1982. *Eastern Indigo Snake Recovery Plan.* U.S. Fish and Wildlife Service. Atlanta, Georgia.
- Witherington, B.E. 1992. Behavioral responses to nesting sea turtles to artificial lighting. *Herpetologica* 48:31-39.

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APPENDIX A
FIVE-YEAR DEVELOPMENT PLAN

Control Install	Wing	FY	Project Nbr	Project Title	Fac Nbr	Fund Stat	ADP
SXHT	45	2012	SXHT001040	CONSTRUCT RV STORAGE AREA	00000	U	
SXHT	45	2012	SXHT051089	CONST FAMILY SUPPORT CENTER OUTDOOR COVERED STAGE & PARK	00000	U	
SXHT	45	2012	SXHT061035	CONSTRUCT BASKETBALL COURTS, RIVERFRONT	00000	U	
SXHT	45	2012	SXHT061070	CONSTRUCT HAZMAT STORAGE FAC	00000	U	
SXHT	45	2012	SXHT101080	Const Munitions Loading Dock	00000	U	
SXHT	45	2013	SXHT031085	Construct Riverwalk Pavilion	00000	U	
SXHT	45	2013	SXHT101061	CONSTRUCT PLUMBING SHOP	00000	U	
SXHT	45	2013	SXHT101064	CONSTRUCT SIGN AND KEY SHOP	00000	U	
SXHT	45	2013	SXHT992516	CONSTRUCT PAVILION, S BEACH	00000	U	
SXHT	45	2014	SXHT101062	CONSTRUCT SHOP SPACE	00000	U	
SXHT	45	2015	SXHT101063	CONSTRUCT WAREHOUSE	00000	U	
SXHT	45	2018	SXHT001067	CONSTRUCT DRY BOAT STORAGE	00000	U	
45 FSS/FSRL	45	2013	SXHT105002	Construct Restrooms, Golf Course Hole #6	00000	U	
		2015	SXHT033003	MAINTENANCE WORKSHOP COMPLEX	00000	U	
		2012	SXHT043002	CORROSION CONTROL FACILITY	00000	U	
		2014	SXHT103001	Construct Guardian Angel Fac, AFRC	00000	U	
		2013	SXHT061018	CONSTRUCT BLAST FENCE	00000	U	
		2014	SXHT081122	GA STORAGE FACILITY	00000	U	
		2015	SXHT973008	CONSTRUCT 920TH HQ FACILITY	00000	U	
SXHT	45	2012	SXHT011065	CONSTRUCT OBSTACLE COURSE	00001	U	
SXHT	45	2015	SXHT011072	CONSTRUCT FIRE TRAINING FACILITY	00001	U	
SXHT	45	2015	SXHT101049	REPAIR SEWAGE LIFT STATION 191	00191	U	I
SXHT	45	2015	SXHT101050	REPAIR SEWAGE LIFT STATION 195	00195	U	I
SXHT	45	2012	SXHT091000P1	CONSTRUCT EMERGENCY GENERATOR & BLDG FOR FAC 209	00209	U	I
SXHT	45	2012	SXHT051111	Construc/Install Cypher Locks, Bldg. 264	00264	U	I

SXHT	45	2013	SXHT011038	REPAIR VQ, BLDG 264	00264	U	I
SXHT	45	2013	SXHT111005	CONSTRUCT LAUNDRY ROOM, BLDG 264	00264	U	I
SXHT	45	2012	SXHT011039	REPAIR VQ, BLDG 265	00265	U	I
SXHT	45	2013	SXHT971020	REPAIR BOAT RAMP, FAC 303	00303	U	III
SXHT	45	2012	SXHT011022	REPAIR/PATCH SEA WALL EAST AND NORTH SIDE FACILITY 600	00304	U	III
SXHT	45	2012	SXHT081145	Repair Hanger 313, Storm Fay	00313	U	III
SXHT	45	2012	SXHT081040	Construct Heavy Equip/Vehicle Wash Rack	00313	U	III
SXHT	45	2012	SXHT081130	Repair Lathe Room Windows, Hangar 313	00313	U	III
SXHT	45	2013	SXHT071033	Repair and Abate Lead Paint, Bldg. 313 NW Hallway	00313	U	III
SXHT	45	2014	SXHT101110	Construct Large Vehicle Welding Shelter, Bldg 313	00313	U	III
SXHT	45	2012	SXHT081077	CONSTRUCT VIEWING STANDS, WARFIT TRACK	00320	U	III
SXHT	45	2012	SXHT101054	Construct 400M Running Track, PAFB	00320	U	III
SXHT	45	2012	SXHT011084	CONSTRUCT WAREHOUSE AT DINING HALL	00350	U	II
SXHT	45	2012	SXHT041029	REPAIR WINDOWS WITH LAMINATED GLASS, DINING HALL	00350	U	II
SXHT	45	2012	SXHT891050	REPAIR VOQ, BLDG 404	00404	U	II
	45	2012	SXHT101039	DEMOLISH LMR BUILDING 407	407	U	II
	45	2013	SXHT101224	DEMO BLDG 408	408	U	II
	45	2014	SXHT101230	Demolish North & Central Water Towers (410, 948)	410	U	II
SXHT	45	2014	SXHT041028	REPAIR WINDOWS WITH LAMINATED GLASS, MINIMALL	00415	U	II
SXHT	45	2012	SXHT001069	REPAIR NORTH ELEVATOR,B423	00423	U	II
SXHT	45	2012	SXHT061052	REPAIR STAIRWELL FIRE DOORS, BLDG 423	00423	U	II
SXHT	45	2013	SXHT051261	REPAIR DOORS BLDG 423	00423	U	II
SXHT	45	2012	SXHT951014B	REPAIR EXTERIOR POST OFFICE B-424	00424	U	II
SXHT	45	2012	SXHT951014C	CONSTRUCT ALTERATIONS EXTERIOR POST OFF B-424	00424	U	II
SXHT	45	2012	SXHT111008	Repair Rest Rooms, Bldg 425	00425	U	II
SXHT	45	2014	SXHT051067	CONSTRUCT LAMINATED WINDOWS, BLDG	00425	U	II

				425			
		2012	SXHT091085	Separate Vault from 920 RQW	00425	U	II
SXHT	45	2012	SXHT021033	REPAIR AIR HANDLERS, PIPING & CONTROLS FAC 431/39/40	00431	U	II
SXHT	45	2013	SXHT091081	REPAIR EXTERIOR, THEATER, BLDG 431	00431	U	II
SXHT	45	2012	SXHT061039	REPAIR EXTERIOR WALKWAYS SEASIDE CHAPEL & ANNEX	00439	U	II
SXHT	45	2012	SXHT031074	REPAIR VAV'S WITH HEAT STRIPS, FACILITY 502	00502	U	III
SXHT	45	2012	SXHT041009	CONSTRUCT PAVILION AT DORM, B502	00502	U	III
SXHT	45	2014	SXHT051072	REPAIR SUPPLY AIR INTAKE, BLDG 502	00502	U	III
SXHT	45	2014	SXHT101029	REPAIR FIRE SUPPRESSION SYSTEM, BLDG 502	00502	U	III
SXHT	45	2012	SXHT011046	REPAIR VQ, BLDG 503	00503	U	III
SXHT	45	2012	SXHT031075	REPAIR VAV'S WITH HEAT STRIPS, FACILITY 503	00503	U	III
SXHT	45	2015	SXHT051073	REPAIR SUPPLY AIR INTAKE, BLDG 503	00503	U	III
SXHT	45	2012	SXHT031079	REPAIR VAV'S W/HEAT STRIPS UPG	00505	U	III
SXHT	45	2013	SXHT7051079	CONSTRUCT DORM ARCHWAY BARRIER, BLDGS 505 AND 506	00505	U	III
SXHT	45	2014	SXHT051074	REPAIR SUPPLY AIR INTAKE, BLDG 505	00505	U	III
SXHT	45	2015	SXHT011066	REPAIR DORMITORY, B505	00505	U	III
SXHT	45	2012	SXHT031080	REPAIR VAVS WITH HEAT STRIPS & UPRIps, UPGRADE ELEC, 506	00506	U	III
SXHT	45	2013	SXHT011047	REPAIR DORM, BLDG 506	00506	U	III
SXHT	45	2013	SXHT041010	CONSTRUCT PAVILION AT DORM, B506	00506	U	III
SXHT	45	2014	SXHT051075	REPAIR SUPPLY AIR INTAKE, BLDG 506	00506	U	III
SXHT	45	2013	SXHT081057	Repair Vehicle Maint Shop, Bldg. 511	00511	U	III
	45	2015	SXHT101228	DEMO BLDG 515	515	U	III
SXHT	45	2012	SXHT031041	REPAIR CONCRETE COOLING TOWER, FACILITY 521	00521	U	III
SXHT	45	2012	SXHT031014	REPAIR 3 AIR HANDLERS, PIPING & CONTROLS, FAC 522	00522	U	III
SXHT	45	2012	SXHT991076	REPAIR EXT FIRE SUPPRESSION SYS B.522	00522	U	III

SXHT	45	2012	SXHT962526	CONSTRUCT CANOPY & DOORS, B-523	00523	U	III
	45	2015	SXHT101226	DEMO BLDG 523	523	U	III
SXHT	45	2012	SXHT961031	CONSTRUCT WTR & WSTE/FUELS MGT SHOP	00524	U	III
	45	2015	SXHT101227	DEMO BLDG 524	524	U	III
SXHT	45	2012	SXHT051082	REPAIR COMM RELAY TOWER FENCE, BLDG 533	00533	U	III
SXHT	45	2012	SXHT061022	SUSTAINMENT-REPAIR FIRE PROTECTION SYSTEM VARIOUS	00533	U	III
SXHT	45	2012	SXHT991079	REPAIR BLDG. 533	00533	U	III
SXHT	45	2012	SXHT921065C	CONSTRUCT ALTERATIONS BLDG 534	00534	U	III
SXHT	45	2013	SXHT041021	REPAIR WINDOWS WITH LAMINATED GLASS, BLDG 534	00534	U	III
SXHT	45	2013	SXHT921065B	REPAIR BLDG 534	00534	U	III
SXHT	45	2012	SXHT041024	REPAIR WINDOWS WITH LAMINATED GLASS, BLDG 537	00537	U	III
SXHT	45	2013	SXHT051081	CONSTRUCT FITNESS CENTER ENTRANCE BARRIER, BLDGS 545 & 546	00545	U	III
SXHT	45	2013	SXHT061031	Repair Fire Protection System, Fitness Center	00545	U	III
SXHT	45	2013	SXHT101055	Expand Athletic Storage Area, Fitness Center	00545	U	III
SXHT	45	2014	SXHT061027	REPAIR ELECTRICAL PANEL, GYM	00545	U	III
45 SVS	45	2014	SXHT061027	REPAIR ELECTRICAL PANEL, GYM	00545	U	III
SXHT	45	2012	SXHT101085	Install Stair Lift, Fitness Center	00546	U	III
45FSS/FSVS	45	2013	SXHT101101	Repair Walls, Fitness Center	00546	U	III
SXHT	45	2012	SXHT061008	REPAIR/REPLACE DUNE PROTECTION SIGNS	00553	U	III
	45	2012	SXHT101019	Demolish Bldg. 557	557	U	III
SXHT	45	2013	SXHT101097	Replace Door for H/C Access, Bldg. 559	00559	U	III
SXHT	45	2013	SXHT101229	Repair Air Distribution Sys, Fac 559	00559	U	III
	45	2013	SXHT011218	Demolish Bldg 559	559	U	III
SXHT	45	2014	SXHT031070	REPAIR CHILLER & AIR HANDLERS, FAC 560	00560	U	III
	45	2013	SXHT101225	DEMO BLDG 560	560	U	III
		2014	SXHT031070	REPAIR CHILLER & AIR HANDLERS, FAC	00560	U	III

				560			
SXHT	45	2015	SXHT041039	CONSTRUCT EXPANSION PASS & ID	00577	U	III
SXHT	45	2012	SXHT061053	REPAIR CAP AND DRILL NEW WELL, 579	00579	U	III
SXHT	45	2013	SXHT972534B	CONSTRUCT WOOD FENCE BOATHOUSE	00601	U	III
		2012	SXHT071065	MOVE WALL SIGN SHOP, BLDG 605	00605	U	III
SXHT	45	2013	SXHT101026	REPAIR LPS SYSTEM, FUEL STORAGE YARD, BLDG 623	00623	U	III
45 LRF	45	2012	SXHT101067	INSTALL DEADMAN SWITCH, FACILITY 623A	623	U	III
SXHT	45	2014	SXHT101033	REPAIR AFFF SYSTEM, BLDG 630	00630	U	III
SXHT	45	2014	SXHT051007	REPAIR INTERIOR BUILDING 632	00632	U	III
SXHT	45	2012	SXHT011049	RENOVATE BLDG 647	00647	U	III
SXHT	45	2014	SXHT081085	Repair Fire and Safety Deficiencies, Hgr 647	00647	U	III
		2014	SXHT081085	Repair Fire and Safety Deficiencies, Hgr 647	00647	U	III
SXHT	45	2014	SXHT101048	REPAIR SEWAGE LIFT STATION 652	00652	U	III
SXHT	45	2012	SXHT941063B4	REPAIR RESTROOMS BLDG 655	00655	U	III
45 CES	45	2012	SXHT101115	REPAIR ROOF, BLDG 661	661	U	III
SXHT	45	2013	SXHT991041	REPAIR RESTROOMS BLDG 673	00673	U	III
SXHT	45	2013	SXHT081136	Construct Refueler Vehicle Exhaust System, B676	00676	U	III
SXHT	45	2014	SXHT101038	REPAIR HVAC CONTROLS ON EXISTING SYSTEM, BLDG 681	00681	U	III
SXHT	45	2012	SXHT071042	REPAIR FIRE SAFETY DEFICIENCIES, B689	00689	U	III
		2012	SXHT071042	REPAIR FIRE SAFETY DEFICIENCIES, B689	00689	U	III
SXHT	45	2014	SXHT001047	REMOVE ABOVE GRND FUEL STG TNK	00691	U	III
SXHT	45	2014	SXHT101037	REPAIR HVAC CONTROLS ON EXISTING SYSTEM, BLDG 698	00698	U	III
SXHT	45	2012	SXHT982506	REPAIR LOAD DOCK & OVERHG, B-700	00700	U	III
SXHT	45	2013	SXHT011014	CONSTRUCT EXTENSION FIRE SUPPRESSION SYSTEM, BUILDING 710	00710	U	III
SXHT	45	2013	SXHT921087	REPAIR BLDG 710, BCE WAREHOUSE	00710	U	III
SXHT	45	2013	SXHT131017	IDIQ-MAINTAIN ROOFS VARIOUS	00710	U	III
SXHT	45	2017	SXHT051061	REPAIR/ UPGRADE BASE LIBRARY, BLDG 722	00722	U	III
SXHT	45	2012	SXHT101058	CONSTRUCT SPRINKLER SYSTEM	00722	U	III

				EXPANSION, BLDG 722			
SXHT	45	2014	SXHT031095	CONSTRUCT ADDITION TO BASE LIBRARY	00722	U	III
	45	2013	SXHT051254	DEMO TRANSIENT ALERT FACILITY 739	739	U	III
SXHT	45	2012	SXHT952540	CONST (ENCLOSE) BLDG 742	00742	U	III
SXHT	45	2012	SXHT011079	REPAIR WIRING HANGAR 750	00750	U	III
		2012	SXHT011079	REPAIR WIRING HANGAR 750	00750	U	III
SXHT	45	2013	SXHT061058	REPAIR WINDOWS, BLDG 751 SOUTH, 2ND FLOOR	00751	U	III
SXHT	45	2014	SXHT101032	REPAIR AFFF SYSTEM, BLDG 751	00751	U	III
SXHT	45	2013	SXHT001028	Construct/Relocate Airfield Light Vault, B805	00802	U	VII
SXHT	45	2013	SXHT101060	REPAIR BLDG 802	00802	U	VII
SXHT	45	2012	SXHT081082	REPAIR PAVEMENT TRENCH DRAIN, BLDG 810	00810	U	
SXHT	45	2013	SXHT021009	REPAIR FIRE DEPARTMENT AREAS, BLDG 810	00810	U	
SXHT	45	2012	SXHT051127	CONSTRUCT STORAGE SHED NEAR BLDG 529	00820	U	V
SXHT	45	2012	SXHT051070	Construct Roll Up Doors, Bldg. 821	00821	U	V
SXHT	45	2013	SXHT101027	REPAIR CARPET/ELECTRICAL OUTLETS, BLDG 821	00821	U	V
SXHT	45	2012	SXHT091063	REPAIR CONCRETE LOADING DOCK, BLDG 822	00822	U	V
SXHT	45	2013	SXHT101104	Construct Restrooms, TMO, Bldg. 822	00822	U	V
SXHT	45	2013	SXHT091065B	Repair Exterior, Comm Terminal Bldg. 891	00891	U	V
SXHT	45	2013	SXHT091065C	Const Alarms Addition, Comm Terminal Bldg. 891	00891	U	V
SXHT	45	2012	SXHT101108	Repair Exterior Corrosion, Bldg 910	00910	U	V
SXHT	45	2012	SXHT972508	CONST CE ADMIN FAC, SHOP LEADS	00912	U	V
SXHT	45	2012	SXHT101092	Repair Pool Bath House, B917	00917	U	V
SXHT	45	2013	SXHT061042	REPAIR FAMILY POOL, FACILITY 919	00919	U	V
SXHT	45	2012	SXHT101040	Repair Concrete Support Columns, Chiller Bldg 925	00925	U	V
SXHT	45	2013	SXHT101047	REPAIR DISCHARGE PIPING, LIFT STATION 928	00928	U	

SXHT	45	2013	SXHT101046	REPAIR SEWAGE LIFT STATION 943	00943	U	
SXHT	45	2013	SXHT081132	Repair Windows, Warehouse B945	00945	U	
SXHT	45	2013	SXHT101113	Repair Restrooms, Bldg 945	00945	U	
SXHT	45	2014	SXHT011053	REPAIR WAREHOUSE, BLDG 945	00945	U	
	45	2012	SXHT101230	Demolish North & Central Water Towers	948	U	
SXHT	45	2012	SXHT031033	REPAIR CORRODED MEMBERS & REPAINT TOWER, 950	00950	U	
SXHT	45	2012	SXHT081023	REPAIR CORROSION CONTROL, COMM TOWERS	00957	U	
	45	2016	SXHT011261	DEMO BLDG. 960	960	U	
SXHT	45	2012	SXHT031036	REPAIR BLDG 965	00965	U	VIB
SXHT	45	2012	SXHT051117	Repair Sidewalk/Lighting, West Side, Tides Club, Bldg 967	00967	U	
SXHT	45	2013	SXHT031026	REPAIR WINDOWS WITH LAMINATED GLASS, TIDES CLUB	00967	U	
SXHT	45	2014	SXHT101096	Repair 0.14 Radar Bldg. 969	00969	U	VIB
SXHT	45	2012	SXHT001020	CONSTRUCT FIRE SUPP SYS, BLDG 981	00981	U	
SXHT	45	2012	SXHT991057	REPAIR LIGHTNING PRO SYS, 981	00981	U	
SXHT	45	2013	SXHT101006	REPAIR WINDOWS, BLDG 984	00984	U	V
SXHT	45	2014	SXHT011058	Repair Warehouse, Bldg 984	00984	U	V
SXHT	45	2013	SXHT071034	REPAIR ABATE LEAD PAINT INTERIOR BLDG 985	00985	U	V
SXHT	45	2013	SXHT101116	Construct/Modify Egress, Office Areas, Hangar 985	00985	U	V
SXHT	45	2014	SXHT101030	REPAIR FIRE SUPPRESSION SYSTEM, BLDG 985	00985	U	V
SXHT	45	2014	SXHT101031	REPAIR AFFF SYSTEM, BLDG 985	00985	U	V
SXHT	45	2012	SXHT051101	REPAIR HVAC, PORTABLE TLM SHELTER, BLDG 986	00986	U	V
SXHT	45	2013	SXHT091001	IDIQ REPAIR PAINT INTERIOR, BLDG 986	00986	U	V
SXHT	45	2013	SXHT101117	Construct/Modify Egress, Office Areas, Hangar 986	00986	U	V
SXHT	45	2012	SXHT021011P5	REPAIR/REPLACE ELEVATOR #2	00989	U	V
SXHT	45	2012	SXHT021026	OVERLAY PARKING AREAS AROUND B & C WINGS, BLDG 989	00989	U	V

SXHT	45	2012	SXHT031013	REPAIR CERAMIC COOLING TOWER 989 "C"	00989	U	V
SXHT	45	2012	SXHT081090	Repair Hallway Walls, SLRSC	00989	U	V
SXHT	45	2012	SXHT971052P2	REPAIR OF EXTERIOR, BLDG 989	00989	U	V
SXHT	45	2012	SXHT971052P3	REPAIR OF EXTERIOR, BLDG 989	00989	U	V
SXHT	45	2012	SXHT971052P4	REPAIR OF EXTERIOR, BLDG 989	00989	U	V
SXHT	45	2014	SXHT031045	Repair Plumbing & Restrooms B989 "A Wing"	00989	U	V
SXHT	45	2014	SXHT101034	REPAIR AIR HANDLER & CHILLERS, BLDG 991	00991	U	
SXHT	45	2012	SXHT081037P1	IDIQ - CONSTRUCT PARKING LOT, BLDG 993	00993	U	VIB
SXHT	45	2014	SXHT051097	CONSTRUCT CANOPY, CONCRETE PAD, BLDG 993	00993	U	VIB
SXHT	45	2013	SXHT041032	Repair Fire Protection System, Education Center	00998	U	VIB
SXHT	45	2013	SXHT071062	Repair/Upgrade Bldg. 1060	01060	U	VIB
SXHT	45	2014	SXHT101036	REPAIR HVAC CONTROLS ON EXISTING SYSTEM, BLDG 1317	01317	U	
SXHT	45	2013	SXHT071028	CONSTRUCT FIRE SPRINKLERS, BCE MAINT SHOP	01352	U	V
SXHT	45	2012	SXHT051006	REPAIR INTERIOR OF BUILDING 1354	01354	U	V
SXHT	45	2014	SXHT041146	CONSTRUCT MUNITIONS BLDG 1355	01355	U	
SXHT	45	2012	SXHT081065	CONSTRUCT PAVILION OVERHANG, SOUTH GATE	01358	U	
SXHT	45	2013	SXHT111011	REPAIR CATCHMENT BASIN, FACILITY 1360	01360	U	
SXHT	45	2012	SXHT031063	REPAIR HVAC, BX	01364	U	VIB
SXHT	45	2014	SXHT031023	REPAIR WINDOWS WITH LAMINATED GLASS, COMMISSARY	01365	U	VIB
SXHT	45	2014	SXHT101035	REPAIR AIR HANDLER & CHILLERS, BLDG 1368	01368	U	VIB
SXHT	45	2012	SXHT031042	REPAIR CONCRETE COOLING TOWER, FACILITY 1380	01380	U	VI
CEO	45	2012	SXHT031042	REPAIR CONCRETE COOLING TOWER, FACILITY 1380	1380	O&M	VI
SXHT	45	2012	SXHT991071	CONSTRUCT FIRE SUPPRESSION 1391	01391	U	
SXHT	45	2012	SXHT991074	CONSTRUCT FIRE SUPPRESSION SYS. 1392	01392	U	VI
SXHT	45	2012	SXHT991073	CONSTRUCT FIRE SUPPRESSION SYS. 1394	01394	U	

SXHT	45	2012	SXHT991072	CONSTRUCT FIRE SUPPRESSION 1402	01402	U	
SXHT	45	2013	SXHT101084	Repair Fire Suppression, Bldg. 1403	01403	U	
45 FSS/FSVF	45	2013	SXHT101084	Repair Fire Suppression, Bldg. 1403	01403	U	
SXHT	45	2013	SXHT101028	REPAIR D, E & F DOCKS, FACILITY 1408	01408	U	VI
SXHT	45	2013	SXHT101078	Const Munitions Storage Igloo 1420	01420	U	
SXHT	45	2014	SXHT101079	Const Munitions Storage Igloo 1421	01421	U	
SXHT	45	2015	SXHT041139	CONST MUNITIONS IGLOO, BLDG 1425	01425	U	
SXHT	45	2012	SXHT001048	REPAIR PERIM FENCE MUNITIONS CMPD	01433	U	
SXHT	45	2012	SXHT041143	REPAIR MUNITIONS M & I BLDG 1433	01433	U	
45 SVS	45	2012	SXHT995000	REPLACE ROOFS, RAIN SHELTERS	01449	U	VI
SERVICES	45	2012	SXHT105017	Construct Maint Rinse Station, Golf Course	01475	U	VI
SXHT	45	2012	SXHT081045P2	MAINTAIN APF DREDGING REQUIREMENTS, GOLF COURSE	01480	U	VI
SXHT	45	2012	SXHT101090	Maintain/Dredge Golf Course Canals	01480	U	VI
SXHT	45	2013	SXHT071059	CONSTRUCT GOLF CART WASH AREA	01491	U	VI
45 SVS	45	2012	SXHT045003	MODIFY MARINA ENTRANCE	01493	U	VI
45 SVS/SVP	45	2014	SXHT055001	REPLACE 25 DOCK PILINGS AT MARINA	01495	U	VI
SXHT	45	2012	SXHT081003	Repair Drainage Culvert Golf Course	01500	U	VI
SXHT	45	2013	SXHT052505	CONSTRUCT TWO DUMPSTER ENCLOSERS, FAC 1651	01651	U	IV
45 SVS	45	2014	SXHT045001	IMPROVE DRAINAGE, FAMCAMP	01651	U	IV
45 SVS	45	2014	SXHT055005	EXPAND FAMCAMP	01651	U	IV
45 FSS	45	2013	SXHT105012	REPAIR WOOD DECKS, FAMCAMP	01652	U	IV
SXHT	45	2012	SXHT041042	CONSTRUCT ADDITION TO WEAPONS FACILITY	01657	U	
SXHT	45	2012	SXHT941058	REPAIR REGULATORS/CABLES, 02/20	02020	U	
SXHT	45	2012	SXHT011009	Maintain Pews and Carpet in Building 3659	03659	U	
SXHT	45	2012	SXHT011062	REPAIR CHAPEL 2, BLDG 3659	03659	U	
SXHT	45	2012	SXHT091079	Repair Power, Pelican Soccer Field	03683	U	
SXHT	45	2015	SXHT061089	REPAIR LIGHT POLES, SOUTH HOUSING SOCCER FIELD	03683	U	
SXHT	45	2014	SXHT002508	REPAIR TENNIS COURTS, SOUTH HOUSING	04083	U	

SXHT	45	2012	SXHT081002	Repair Schobel Field	04085	U	
SXHT	45	2012	SXHT001031	MAINTAIN CLEAR TREES, AIRFIELD	11029	U	AIR
SXHT	45	2013	SXHT991047P4	Repair Fill/Grade Drainage, Airfield	11029	U	AIR
SXHT	45	2012	SXHT031022	CONSTRUCT BARRIER SYSTEM, TIDES CLUB	20000	U	
SXHT	45	2012	SXHT051080	Construct Fence Around Gas Meter, Tides Club, Bldg 967	20000	U	
SXHT	45	2012	SXHT061007	REPAIR EXISTING A1A CRASH GATE	20000	U	
SXHT	45	2013	SXHT031028	CONSTRUCT BASE PERIMETER WARNING SIGNS	20000	U	
SXHT	45	2013	SXHT081134	Repair Airfield Security Access Gates	20000	U	VII
SXHT	45	2013	SXHT081134C	Construct Security Fencing, Airfield Areas	20000	U	VII
SXHT	45	2012	SXHT091000	REPAIR WATER LINES, VARIOUS	20100	U	
SXHT	45	2014	SXHT021048	REPAIR MANHOLE RACKS	20100	U	
SXHT	45	2012	SXHT021037C2	Construct Road to SFS Mobility Facility	20200	U	
SXHT	45	2013	SXHT021037C3	Construct Parking Area Adjacent to Building 1350	20200	U	V
SXHT	45	2014	SXHT021037C4	Construct New Road To Building 649/655	20200	U	III
SXHT	45	2014	SXHT041037C	Construct TACAN Road	20203	U	
SXHT	45	2014	SXHT041145	CONSTRUCT WIDENING MUNITIONS ACCESS RD	20212	U	
SXHT	45	2012	SXHT011032	CONSTRUCT SECURITY BARRIERS	20400	U	
SXHT	45	2012	SXHT051145	Repair N. Beach Housing	20405	U	III
SXHT	45	2012	SXHT061064	MAINTAIN PARKING LOT, BETWEEN BLDG'S 720 & 722	20405	U	III
SXHT	45	2013	SXHT051122	REPAIR SOUTH AND WEST SIDES BLDG 981 PAVEMENT	20405	U	
SXHT	45	2013	SXHT051146	Construct/Modify Entrance to BX/Commissary	20405	U	
SXHT	45	2013	SXHT061037P5	MAINTAIN PARKING AREAS, BLDGS 630 & 632	20405	U	III
45 FSS/FSCM	45	2012	SXHT105016	Construct Add'l Parking, PAFB Marina	20405	U	
SXHT	45	2014	SXHT071027	CONSTRUCT SOUTH JOGGING TRAIL	20500	U	
SXHT	45	2015	SXHT071030	CONSTRUCT SOUTHEAST JOGGING TRAIL	20500	U	
SXHT	45	2014	SXHT021005C	CONSTRUCT MINI WORKOUT STATIONS ON BIKE/JOGGING TRAIL	20501	U	

SXHT	45	2012	SXHT941012B	Repair South Airfield Overrun	20601	U	
		2016	SXHT071058	CONSTRUCT PAVEMENT, BLDG 750	20602	U	III
SXHT	45	2012	SXHT051143	MAINTAIN 750 RAMP	20610	U	III
SXHT	45	2012	SXHT081048	REPAIR MILL AND OVERLAY APRON, N & S RAMP, BLDG 810	20610	U	
SXHT	45	2013	SXHT051054	REPAIR 750 RAMP	20610	U	
SXHT	45	2013	SXHT051125	REPAIR ASPHALT SHOULDER/DRAINAGE SWALE	20610	U	
SXHT	45	2013	SXHT051144	REPAIR SEAL DRAINAGE PIPES/LIFT SLABS 750 RAMP	20610	U	
SXHT	45	2013	SXHT101013	REPAIR MILL AND OVERLAY TXWY CHARLIE	20610	U	
SXHT	45	2015	SXHT101099	Repair/Replace Pavement Section, Rwy 20	20610	U	
	45	2012	SXHT101011	Demo Abandoned Airfield Pavement and Obstructions	20610	U	
SXHT	45	2012	SXHT051141	REPAIR NORTH 02/20 OVERRUN	20630	U	VII
SXHT	45	2013	SXHT101010	Repair/Install Backflow Preventers, Various	20700	U	
SXHT	45	2012	SXHT067047	REPAIR CONTINUOUS WATER SYSTEM MONITORING	20702	U	
SXHT	45	2012	SXHT121000	Repair Water Distribution System, PAFB	20706	U	
SXHT	45	2013	SXHT131000	Repair Water Distribution System, PAFB	20706	U	
SXHT	45	2014	SXHT141000	Repair Water Distribution System, PAFB	20706	U	
SXHT	45	2015	SXHT151000	Repair Water Distribution System, PAFB	20706	U	
SXHT	45	2013	SXHT011081	CONSTRUCT AIR CONDITIONING COOLING TOWERS TO SANITARY SEWER	20800	U	
SXHT	45	2012	SXHT071001	REPAIR/REPLACE SEWER MAINS AND PUMP	20804	U	
SXHT	45	2012	SXHT101005	Repair HV Electric Lines, Golf Course & N Base	20900	U	
SXHT	45	2014	SXHT061125	Repair Transformer Vault, Blockhouse	20900	U	
SXHT	45	2012	SXHT991044	REPAIR SIGNAL AT FIRE STATION	20904	U	
SXHT	45	2012	SXHT081046	Resurface Parking Area, Class 6 Store, Bldg 1360	20905	U	
SXHT	45	2014	SXHT001062	REPAIR LIGHT POLES, RUNWAY	30101	U	
SXHT	45	2013	SXHT101012	Repair Taxiway Signs, Lights and Markings	30103	U	
SXHT	45	2013	SXHT101094	Construct/Relocate Airfield Rotating Beacon	30103	U	

SXHT	45	2015	SXHT101098	Repair/Upgrade Approach Lighting Sys, Rwy 20	30105	U	
SXHT	45	2012	SXHT071037P2	Repair Pavement on Rescue Road, Phase 2	30305	U	
SXHT	45	2014	SXHT101112	Construct Exercise Trail for Land Reutilization	80065	U	
SXHT	45	2012	SXHT031071	REPAIR OFFICES, DUCT AND INSULATION, FACILITIES 560 & 561	MULTI	U	
SXHT	45	2012	SXHT121015	FY12/IDIQ- MAINTAIN PAINT VARIOUS FACILITIES	MULTI	U	
SXHT	45	2012	SXHT121017	IDIQ- MAINTAIN ROOFS VARIOUS	MULTI	U	
SXHT	45	2012	SXHT121037	Maintain/Repair Streets/Parking, Various, PAFB	MULTI	U	
SXHT	45	2013	SXHT091091	MAINTAIN CATHODIC PROTECTION SYSTEM, WATER TOWERS 410 & 948	MULTI	U	
SXHT	45	2013	SXHT101114	Repair Ceiling Fans/Lights, Dorms 505, 506	MULTI	U	
SXHT	45	2013	SXHT131015	FY13/IDIQ- MAINTAIN PAINT VARIOUS FACILITIES	MULTI	U	
SXHT	45	2013	SXHT131037	Maintain Streets & Parking, Various PAFB	MULTI	U	
		2012	SXHT081120	SIDEWALKS, CURBS, GUTTERS,BOLLARDS, B603, 605, 624, 629 & 632	MULTI	U	
		2012	SXHT031071	REPAIR OFFICES, DUCT AND INSULATION, FACILITIES 560 & 561	MULTI	U	
NULL	MED GROUP	2013	SXHT108000	Construct Vet Clinic	TBD	O&M	
45 MDS	45	2012	SXHT098017	Maintain Roofs, Medical Fac's		O&M	
CEOE	45	2013	SXHT971300	REPLACE LIGHTING, MED FACS		O&M	
NULL	45	2015	SXHT063001	REPLACE JP-8 TANKS		U	
NULL	45	2012	SXHT071044	MAINTAIN ROAD, NORTH/CENTRAL FUELS AREA		U	
45 LRF	45	2012	SXHT101066	REPAIR ROADWAY, NORTH BULK STORAGE AREA		U	

APPENDIX B
CONSULTATION WITH
U.S. FISH AND WILDLIFE SERVICE



United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

February 28, 2012

Ms. Theresa Ahlin, Asset Optimization Chief
45 CES/CEAO
1224 Jupiter Street, MS 9125
Patrick AFB, FL 32925-3343

FWS Log Number: 2012-I-0069

Dear Ms. Ahlin:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter received on 10 January 2012, for informal section 7 consultation for the Implementation of General Plan Development (IGPD) at Patrick Air Force Base (PAFB) in Brevard County, Florida as reviewed in the Draft Environmental Assessment for IGPD at PAFB. PAFB proposes new facility construction, facility/structure renovation, expansion and demolition, stormwater design, marina and canal dredging, and general maintenance over the next five years. We provide the following comments in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

We provide PAFB our comments on the effects of the proposed project on nesting and hatchling loggerhead (*Caretta caretta*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea*) sea turtles, the Florida manatee (*Trichechus manatus latirostris*), the American wood stork (*Mycteria americana*), and the Eastern indigo snake (*Drymarchon corais couperi*).

For sea turtles, the main concern with PAFB's IGPD is the effect the lighting associated with this program may have on nesting and hatchling sea turtles at PAFB. Artificial lighting can be detrimental to sea turtles in several ways. Field observations have shown a correlation between lighted beaches and reduced sea turtle nesting. Adult females rely on visual brightness cues to find their way back to the ocean after nesting and those turtles that nest on lighted beaches may be disoriented by artificial lights and have difficulty finding their way back to the ocean.

Under natural conditions, hatchling sea turtles, which typically emerge from nests at night, move toward the brightest, most open horizon, which is over the ocean. However, when bright light sources are visible on the beach, they become the brightest spot on the horizon and attract hatchlings in the wrong direction, making them more vulnerable to predators, desiccation,

entrapment in debris or vegetation, and exhaustion, and often luring them onto roadways and parking lots where they are run over. Artificial lights can also disorient hatchlings once they reach the water.

PAFB proposes the following measures to reduce the impacts of exterior lighting:

1. Re-configuration of the traffic signal at the Blockhouse to include mast-arms and programmable signals to allow illumination adjustments (contingent on funding);
2. All lighting proposed will be in compliance with the light management requirements set in the Biological Opinion (FWS Log Number: 41910-2009-F-0087) and the USFWS-approved 45th Space Wing (45 SW) internal policy 45 SW Instruction 32-7001, *Exterior Lighting Management*, as noted in the Biological Opinion;
3. Lighting designs will be reviewed by the 45th Space Wing Environmental staff to ensure fixture selections, placement, and lumen levels will prevent visibility of artificial lighting on the beach and minimize glow;
4. Tinting of the windows and interior blinds/shades will be incorporated into applicable designs to reduce interior glow visible to the exterior facilities; and
5. Light Management Plans (LMP) will be developed for all new facilities that are in close proximity to the beach or will have fixtures/lighting that may be visible from the beach during the late design phases and provided to the Service for review and approval.

The Service concurs with your determination and no further consultation for the IGDP is necessary provided the following additional activities are incorporated into the IGDP:

1. Regarding the tinting of the windows and interior blinds/shades, the tinting of the windows must be glass treated to achieve an industry- approved, inside to outside light transmittance value of 45% or less. Such transmittance is limited to the visible spectrum (400 to 700 nanometers) and is measured as the percentage of light that is transmitted through the glass.
2. Lighting directly visible from the beach is shielded so that the point source of light or any reflective surface is not directly visible from the beach. Native vegetation must be planted and maintained to further shield any light visible from the beach due to the lighting provided frequent erosion (annual) won't destroy the vegetation.
3. The LMPs must be reviewed and approved by the Service in the early design phase. This will allow us to work together to provide the best available sea turtle 'friendly' lighting technology for the project.

For the Florida manatee, the Service concurs with your determination and no further consultation for the IGDP is necessary provided the following activities are incorporated into the IGDP:

1. The Standard Manatee Conditions for In-Water Construction (2011); and

2. When in-water work is being performed or vessels are moving, at least one person will be designated as a manatee observer.

For the wood stork and Eastern indigo snake, the Service concurs with your determination and no further consultation for the IGDP is necessary:

Although this does not represent a Biological Opinion as described in section 7 of the ESA, it does fulfill the requirements of the ESA. If modifications are made in the project or additional information becomes available on listed species, reinitiation of consultation may be required.

Conservation recommendations under the authority of the Migratory Bird Treaty Act

The Service understands that least terns and black skimmers are sensitive to human disturbance and that human disturbance may be hindering these species from establishing nesting colonies in areas that are subjected to even slight human disturbance. If PAFB has the authority and available resources, the Service encourages PAFB to identify areas suitable for nesting for least terns and black skimmers and to limit human access to those areas on a seasonal basis to encourage nesting and aid their conservation.

The Service appreciates the cooperation of PAFB. We look forward to working with you and your staff regarding the IGDP. For further coordination please contact Ann Marie Lauritsen at (904) 525-0661.

Sincerely,



for

David L. Hankla
Field Supervisor

Cc: Sandy MacPherson- JAX FO



United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

FWS Log No. 41910-2009-F-0087

November 18, 2008

Brigadier General Edward L. Bolton, Jr.
Commander, 45th Space Wing, 45 CES/CEVP
1224 Edward H. White II Street, MS-7100
Patrick AFB, Florida 32925-3299
(ATTN: Robin Sutherland)

FWS Log No. 41910-2009-F-0087

Dear General Bolton:

This document transmits the U.S. Fish and Wildlife Service's (Service) final biological opinion (BO) based on our review of historical and anticipated future light management activities by the 45th Space Wing (45th SW) of the U.S. Air Force at the Cape Canaveral Air Force Station (CCAFS) and Patrick Air Force Base (PAFB) in Brevard County, Florida, and their effects on nesting and hatchling loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), and Kemp's ridley (*Lepidochelys kempii*) sea turtles in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

On April 13, 1988, Mr. Earl Possardt, the Southeastern Sea Turtle Coordinator for the Service, met with several representatives of the Air Force to discuss a security upgrade lighting for Launch Complex (LC) 17, 40, and 41 and the sea turtle hatchling disorientations at this installation. During the 1987 – 1990 sea turtle nesting season, there were between 2236 loggerhead nests and 26-78 green turtle nests on CCAFS. For the 1988 sea turtle nesting season, 69 nests at CCAFS and 4 nests at PAFB were disoriented or misoriented due to CCAFS lighting. On August 15, 1988, the Service sent a letter to the 45th SW reiterating the

concern for the number of disorientations at CCAFS and the need for compliance with Section 7 of the Act, as amended. The Air Force replied with a letter to the Service on September 19, 1988 indicating their desire to resolve the lighting issues at CCAFS. Following this letter, it was agreed that the Air Force would develop light management plans (LMP) in cooperation with the Service, for its launch complexes and other facilities at CCAFS. On October 17, 1989, LMPs were provided to the Service for the following areas: Industrial Area, Vertical Integration Building (VIB), Port Area, LC 17, LC 40, and LC 41. On February 28, 1990, revised LMPs were provided to the Service for LC 17 and LC 41. For the 1990 sea turtle nesting season, 160 nests at CCAFS and 12 nests at PAFB were disoriented or misoriented due to CCAFS lights.

On February 9, 1990, the Service issued a Biological Opinion (BO) for the LMP for LC 36. On January 17, 1991, a revised LMP was provided to the Service for the Port Area. On April 9, 1991, the Service issued their BO authorizing an incidental take of hatchlings from 75 loggerhead and 2 green turtle nests at CCAFS and hatchlings from 2 loggerhead nests at PAFB. In subsequent years, the authorized level of incidental take was to reduce by 50% each year following the implementation of the LMPs. The Air Force developed seven LMPs, eliminated 293 incandescent, high pressure sodium, mercury vapor fixtures and quartz lights. Four hundred and seventy-seven incandescent lights were replaced with yellow buglights. Eight hundred and forty-four incandescent, high pressure sodium, mercury vapor, quartz, and metal halide lights were changed to low pressure sodium. Four hundred and forty-nine high pressure sodium lights were shielded. Lights not in use were shut off and compliance was recorded ensuring routine security inspection and patrols. Annual notices to all complex personnel were issued prior to sea turtle nesting season.

On September 9, 1991, the Service received a letter from the Air Force to report that CCAFS had exceeded the incidental take for sea turtle hatchlings authorized by the Service in the April 9, 1991, BO. The Air Force has exceeded its authorized incidental take by 61 loggerhead nests. On October 10, 1991, the Service's Southeastern Sea Turtle Coordinator, Mr. Earl Possardt, met with representatives of CCAFS to discuss the implementation of the LMPs and additional measures to minimize the number of hatchling disorientations. The exceeded take was due to a higher number of nests and more comprehensive nesting and lighting surveys. To minimize further disorientations, 280 susceptible nests were screened. The BO written on April 9, 1990 was modified to include all hatchlings from nests disoriented and misoriented during the 1991 nesting and hatching season. Incidental take for subsequent years was authorized for hatchlings from four percent of the nests at CCAFS during the 1992 nesting season and reduced to two percent for subsequent years. The Service amended their BO on May 2, 2000 to authorize an incidental take of two percent of hatchlings and two percent of nesting females at CCAFS.

Patrick Air Force Base: On August 30, 2004, the Service received an email from an Air Force, 45th SW representative of PAFB, Ms. Keitha Dattilo-Bain, to inform us that the 2% incidental take of sea turtles given in the BO dated May 2, 2000 was exceeded. The email contained

information with precautions that were being conducted to reduce the number of disorientation events; such as reducing/shielding the safety/security lighting at a few facilities and planting more dune vegetation in the areas from the Officers' Club to the north Distinguished Visitors beach housing. Keitha Dattilo-Bain stated that the traffic lights on State Road (SR) A1A for the Main Gate and the former Officers' Club/Blockhouse (including public beach access lights) appeared to be the cause of the majority of the disorientation events. Modifications to the lights were being researched to attempt to develop a solution by next nesting season, but it would be low on the Brevard County Traffic Engineering's (BTE) list as repairs to other traffic lights destroyed by the hurricanes in 2004 would be top priority. In the interim, funding would be obtained by the Air Force and coordination with the Florida Department of Transportation (FDOT) and BTE would occur to strive for retrofitting before the next nesting season.

In 2005, two lighting surveys were conducted at PAFB by the University of Central Florida Marine Turtle Research Group and a representative of the 45th SW, Keitha Dattilo-Bain. The surveys included patrolling the beach at night to determine sources of light that could potentially cause disorientations of sea turtles. The surveys identified the traffic lights at the Main Gate and Officers' Club as light sources likely to cause sea turtle disorientations during the 2005 sea turtle nesting season. On July 28, 2005, the Service received an email from Keitha Dattilo-Bain to discuss the traffic lights at the Main Gate and Officers' Club. Emails were exchanged with Keitha Dattilo-Bain of PAFB, Dean Gallagher of the Florida Fish and Wildlife Conservation Commission, Doug Mihalich of BTE, and the Service as to a possible solution for the traffic lights. On July 28, 2005, the Service received an email from Keitha Dattilo-Bain stating that the solution reached through discussions with FDOT) and BTE was for installation of shielding louvers on the traffic lights. The lighting from the traffic signals would still be visible on the beach but reduced. In the interim, while waiting for the Air Force funds and BTE scheduling, the Air Force agreed to use silt fencing to temporarily shield any nests laid on the dune that were likely to be affected by the traffic lights.

Louvers were installed at the traffic lights at the Main Gate and former Officer's Club/Blockhouse at PAFB in January 2006. BTE readjusted the louvers, installed new mounting hardware, and added new signal heads to increase visibility for motorists. Strong winds in February and March of 2006 caused significant sway of these traffic lights, which, in combination with the louvers, reduced the ability of motorists to see the traffic signal. In March 2006, FDOT ordered the louvers from the Main Gate to be removed due to safety concerns and public complaints. The pedestrian and beach access signal louvers at the former Officer's Club/Blockhouse were opened to three times their original configuration. Other alternatives for the traffic lights were discussed at a meeting held on April 13, 2006 with Keitha Dattilo-Bain, the Service, Doug Mihalich, Rick Morrow, Chris Cairns, Suzanne Hertz, representatives of FDOT, and OJ Oujevolk of BTE. Options for removing the traffic signal at the former Officer's Club/Blockhouse were discussed as well as rerouting traffic and turning off lights during the nesting season. Discussions are on-going between the 45th SW, FDOT, BTE, and the Service to minimize impacts to sea turtles from the traffic lights.

On October 21, 2004, the Service received a letter from Angy Chambers, a representative of CCAFS, to inform us that the incidental take of 2% for sea turtles given in the May 2, 2000 BO, was also exceeded at this location. On June 27, 2005, the Service conducted a site visit and met with representatives of the 45th SW, including Angy Chambers and Randall Rowland. The possible lighting sources causing the sea turtle hatchling disorientations and misorientations were discussed.

On August 23, 2006, the Service issued an interim BO for the 2006 and 2007 nesting seasons. The "Terms and Conditions" provided in the interim BO were assessed and amended "Terms and Conditions" were discussed. Disorientation is defined as a nesting female's or hatchling's loss of orientation, being unable to maintain constant directional movement. Misorientation is defined as orientation in the wrong direction. This BO represents the final BO with an allowable percentage of incidental take from lighting disorientations and misorientations.

On September 17, 2008, a representative of CCAFS provided the Service with the 2007 Sea Turtle Hatchling Disorientation Report for CCAFS and PAFB. The Service had sufficient information to complete the final BO.

Information for this final BO was obtained by email correspondence, meetings, several site visits, telephone conversations and other sources of information. A complete administrative record of this consultation is on file at the Service's Jacksonville Field Office.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The area involved in this biological opinion is the entirety of CCAFS and PAFB in Brevard County, Florida. The CCAFS has approximately 21 km of nesting beach and PAFB approximately 7 km of beach. At CCAFS, Light Management Plans (LMP) were previously developed for CCAFS and at PAFB, a Light Management Plan was developed for the base and approved by the Service in 1993, in an attempt to reduce or eliminate sea turtle hatchling disorientation/misorientation events. Facility custodians and managers are responsible for ensuring compliance of site personnel with operational constraints. The 45th SW Civil Engineering Squadron/Civil Engineering Environmental Protection (CES/CEVP) office conducts lighting inspections and records noncompliance, and the person responsible for the lights is notified. In addition, facility managers are required to report noncompliant lights. The 45th SW issues annual notices to all personnel prior to the sea turtle nesting season reminding tenants of light use requirements and responsibilities.

The previously issued May 2, 2000, BO requires the 45th SW to develop LMPs for all new construction and all facilities that currently do not have an LMP at CCAFS and PAFB for submittal to the Service for review and approval. The purpose of reinitiating consultation due to authorized incidental take being exceeded, is to reevaluate the level of anticipated incidental

take as a result of disorientation and misorientation, modify the Service's minimization measures, review the 45th SW lighting guidelines, retrofit where feasible the lighting sources that are potentially causing the disorientations/misorientations, and re-evaluate the need for individual facility LMPs.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species/critical habitat description

Loggerhead Sea Turtle

The loggerhead sea turtle was listed as a threatened species on July 28, 1978 (43 FR 32800). The loggerhead occurs throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans.

Within the continental U.S., loggerheads nest from Texas to Virginia with major nesting concentrations found in South Florida. Additional nesting concentrations occur on coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (NMFS and Service 1991b). Within the western Atlantic, loggerheads also nest in Mexico and the Caribbean.

The loggerhead sea turtle grows to an average weight of about 200 pounds and is characterized by a large head with blunt jaws. Adults and subadults have a reddish-brown carapace. Scales on the top of the head and top of the flippers are also reddish-brown with yellow on the borders. Hatchlings are a dull brown color (NMFS 2002a). The loggerhead feeds on mollusks, crustaceans, fish, and other marine animals.

The loggerhead occurs throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. However, the majority of loggerhead nesting is at the western rims of the Atlantic and Indian Oceans. The species is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and ship wrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and often in association with other species of sea turtles.

No critical habitat has been designated for the loggerhead sea turtle.

On November 16, 2007, the Service and NMFS received a petition from Oceana and the Center for Biological Diversity requesting that loggerhead turtles in the western North Atlantic Ocean be reclassified as a Distinct Population Segments (DPS) with endangered status and that critical habitat be designated. A DPS is a population segment that is discrete in relation to the remainder of the species to which it belongs, and significant to the species to which it belongs.

NMFS took the lead on the petition response and issued a 90-day finding on March 5, 2008 in the Federal Register, that the petition presents substantial scientific information indicating that the petitioned action may be warranted. NMFS has initiated a review of the status of the species to determine whether the petitioned action is warranted and to determine whether any additional changes to the current listing of the loggerhead turtle are warranted and solicited public comment that ended on May 5, 2008 (73 FR 11849).

Green Sea Turtle

The green sea turtle was federally listed as a protected species on July 28, 1978 (43 FR 32800). Breeding populations of the green turtle in Florida and along the Pacific Coast of Mexico are listed as endangered; all other populations are listed as threatened. The green sea turtle has a worldwide distribution in tropical and subtropical waters. Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (NMFS and Service 1991a). Nesting also has been documented along the Gulf coast of Florida from Escambia County through Franklin County in northwest Florida and from Pinellas County through Collier County in southwest Florida (FWC Statewide Nesting Beach Survey database). Green turtles have been known to nest in Georgia, but only on rare occasions (Georgia Department of Natural Resources statewide nesting database). The green turtle also nests sporadically in North Carolina and South Carolina (North Carolina Wildlife Resources Commission statewide nesting database; South Carolina Department of Natural Resources statewide nesting database). Unconfirmed nesting of green turtles in Alabama has also been reported (Bon Secour National Wildlife Refuge nesting reports).

Green sea turtles are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. The green turtle is attracted to lagoons and shoals with an abundance of marine grass and algae. Open beaches with a sloping platform and minimal disturbance are required for nesting.

The green sea turtle grows to a maximum size of about 4 feet and a weight of 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers. The carapace is smooth and colored gray, green, brown and black. Hatchlings are black on top and white on the bottom (NMFS 2002b). Hatchling green turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae.

Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys.

Leatherback Sea Turtle

The leatherback sea turtle, listed as an endangered species on June 2, 1970 (35 FR 8491), nests on shores of the Atlantic, Pacific and Indian Oceans. Leatherbacks have the widest distribution of the sea turtles with nesting on beaches in the tropics and sub-tropics and foraging excursions into higher-latitude sub-polar waters. They have evolved physiological and anatomical adaptations (Frair et al. 1972, Greer et al. 1973) that allow them to exploit waters far colder than any other sea turtle species would be capable of surviving. Non-breeding animals have been recorded as far north as the British Isles and the Maritime Provinces of Canada and as far south as Argentina and the Cape of Good Hope (Pritchard 1992). Nesting grounds are distributed worldwide, with the Pacific Coast of Mexico historically supporting the world's largest known concentration of nesting leatherbacks. The largest nesting colony in the wider Caribbean region is found in French Guiana, but nesting occurs frequently, although in lesser numbers, from Costa Rica to Columbia and in Guyana, Surinam, and Trinidad (NMFS and Service 1992; National Research Council 1990a).

The leatherback regularly nests in the U.S., in Puerto Rico, the U.S. Virgin Islands, and along the Atlantic coast of Florida as far north as Georgia (NMFS and Service 1992). Leatherback turtles have been known to nest in Georgia, South Carolina, and North Carolina, but only on rare occasions (North Carolina Wildlife Resources Commission; South Carolina Department of Natural Resources; and Georgia Department of Natural Resources statewide nesting databases). Leatherback nesting has also been reported on the northwest coast of Florida (LeBuff 1990; FWC Statewide Nesting Beach Survey database); and in southwest Florida a false crawl (non-nesting emergence) has been observed on Sanibel Island (LeBuff 1990).

This is the largest, deepest diving of all sea turtle species. The adult leatherback can reach 4 to 8 feet in length and weigh 500 to 2,000 pounds. The carapace is distinguished by a rubber-like texture, about 1.6 inches thick, made primarily of tough, oil-saturated connective tissue. Hatchlings are dorsally mostly black and are covered with tiny scales; the flippers are edged in white, and rows of white scales appear as stripes along the length of the back (NMFS 2002c). Jellyfish are the main staple of its diet, but it is also known to feed on sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

Adult females require sandy nesting beaches backed with vegetation and sloped sufficiently so the distance to dry sand is limited. Their preferred beaches have proximity to deep water and generally rough seas.

Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (50 CFR 17.95).

Hawksbill Sea Turtle

The hawksbill sea turtle was listed as an endangered species on June 2, 1970 (35 FR 8491). The hawksbill is found in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean.

Within the continental U.S., hawksbill sea turtle nesting is rare and is restricted to the southeastern coast of Florida (Volusia through Dade Counties) and the Florida Keys (Monroe County) (Meylan 1992; Meylan et al. 1995). However, hawksbill tracks are difficult to differentiate from those of loggerheads and may not be recognized by surveyors. Therefore, surveys in Florida likely underestimate actual hawksbill nesting numbers (Meylan et al. 1995). In the U.S. Caribbean, hawksbill nesting occurs on beaches throughout Puerto Rico and the U.S. Virgin Islands (NMFS and Service 1993).

Hawksbills typically weigh around 176 pounds or less in the wider Caribbean; hatchlings average about 1.6 inches straight length and range in weight from 0.5 to 0.7 ounces. The carapace is heart shaped in young turtles, and becomes more elongated or egg-shaped with maturity. The top scutes are often richly patterned with irregularly radiating streaks of brown or black on an amber background. The head is elongated and tapers sharply to a point. The lower jaw is V-shaped (NMFS 2002d).

Critical habitat for the hawksbill sea turtle has been designated for selected beaches and/or waters of Mona, Monito, Culebrita, and Culebra Islands, Puerto Rico.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle was listed as endangered on December 2, 1970 (35 FR 18320). The Kemp's ridley, along with the flatback sea turtle (*Natator depressus*), has the most geographically restricted distribution of any sea turtle species. The range of the Kemp's ridley includes the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland. The majority of nesting for the entire species occurs on the primary nesting beach at Rancho Nuevo (Marquez-M. 1994).

Outside of nesting, adult Kemp's ridleys are believed to spend most of their time in the Gulf of Mexico, while juveniles and subadults also regularly occur along the eastern seaboard of the U.S. (Service and NMFS 1992). There have been rare instances when immature ridleys have been documented making transatlantic movements (Service and NMFS 1992). It was originally speculated that ridleys that make it out of the Gulf of Mexico might be lost to the breeding population (Hendrickson 1980), but data indicate that many of these turtles are capable of moving back into the Gulf of Mexico (Henwood and Ogren 1987). In fact, there are documented cases of ridleys captured in the Atlantic that migrated back to the nesting beach at Rancho Nuevo (Schmid and Witzell 1997, Schmid 1998, Witzell 1998).

Hatchlings, after leaving the nesting beach, are believed to become entrained in eddies within the Gulf of Mexico, where they are dispersed within the Gulf and Atlantic by oceanic surface currents until they reach about 7.9 inches in length, at which size they enter coastal shallow water habitats (Ogren 1989).

No critical habitat has been designated for the Kemp's ridley sea turtle.

Life history

Loggerhead Sea Turtle

Loggerheads are long-lived, slow-growing animals that use multiple habitats across entire ocean basins throughout their life history. This complex life history encompasses terrestrial, nearshore, and open ocean habitats. The three basic ecosystems in which loggerheads live are the:

1. Terrestrial zone (supralittoral) - the nesting beach where both oviposition (egg laying) and embryonic development and hatching occur.
2. Neritic zone - the inshore marine environment (from the surface to the sea floor) where water depths do not exceed 656 feet (200 meters). The neritic zone generally includes the continental shelf, but in areas where the continental shelf is very narrow or nonexistent, the neritic zone conventionally extends to areas where water depths are less than 656 feet (200 meters).
3. Oceanic zone - the vast open ocean environment (from the surface to the sea floor) where water depths are greater than 656 feet (200 meters).

Maximum intrinsic growth rates of sea turtles are limited by the extremely long duration of the juvenile stage and fecundity. Loggerheads require high survival rates in the juvenile and adult stages, common constraints critical to maintaining long-lived, slow-growing species, to achieve positive or stable long-term population growth (Congdon et al. 1993; Heppell 1998; Crouse 1999; Heppell et al. 1999, 2003; Musick 1999).

The basic life cycle of the loggerhead turtle in the western North Atlantic consists of seven life stages (Figure 1) that are based on the size of the sea turtles at different ages (Bolten 2003, Crouse et al. 1987).

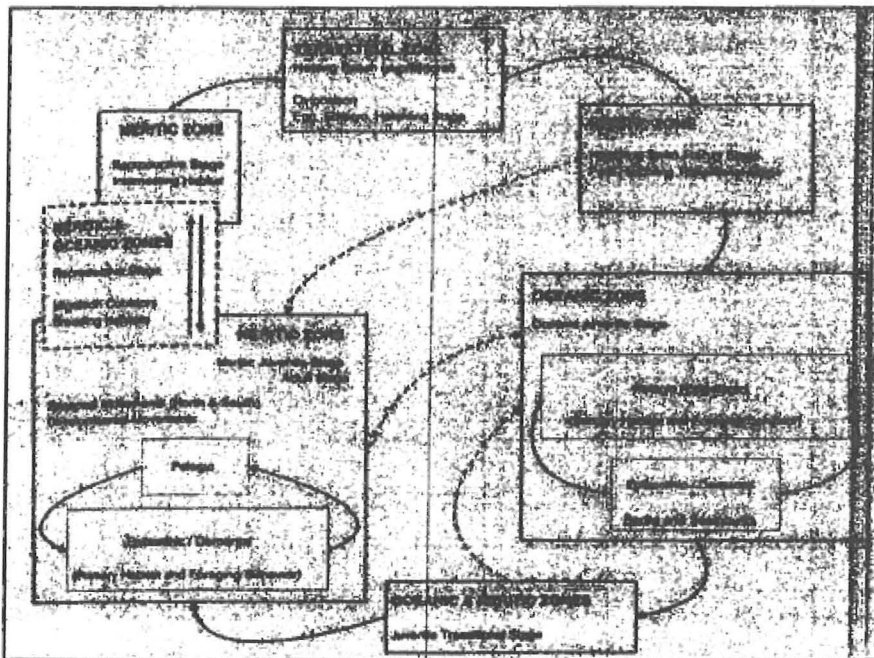


Figure 1. Life history stages of a loggerhead turtle. The boxes represent life stages and the corresponding ecosystems, solid lines represent movements between life stages and ecosystems, and dotted lines are speculative (Bolten 2003).

Numbers of nests and nesting females are often highly variable from year to year due to a number of factors including environmental stochasticity, periodicity in ocean conditions, anthropogenic effects, and density-dependent and density-independent factors affecting survival, growth, and reproduction (Meylan 1982, Hays 2000, Chaloupka 2001, Solow et al. 2002). Despite these sources of variation, and because female turtles exhibit strong nest site fidelity, a nesting beach survey can provide a valuable assessment of changes in the adult female population, provided that the study is sufficiently long and effort and methods are standardized (Meylan 1982, Gerrodette and Brandon 2000, Reina et al. 2002).

Life History Trait	Data
Clutch size (mean)	100-126 eggs ¹
Incubation duration (varies depending on time of year and latitude)	Range = 42-75 days ^{2,3}
Juvenile (<87 cm CCL) sex ratio	65-70% female ⁴
Pivotal temperature (incubation temperature that produces an equal number of males and females)	29.0°C ⁵

Nest productivity (emerged hatchlings/total eggs) x 100 (varies depending on site specific factors)	Range = 45-70% ^{2,6}
Clutch frequency (number of nests/female/season)	3-4 nests ⁷
Interesting interval (number of days between successive nests within a season)	12-15 days ⁸
Remigration interval (number of years between successive nesting migrations)	2.5-3.7 years ⁹
Nesting season	late April-early September
Hatching season	late June-early November
Age at sexual maturity	32-35 years ¹⁰
Life span	>57 years ¹¹

¹ Dodd 1988.

² Dodd and Mackinnon (1999, 2000, 2001, 2002, 2003, 2004).

³ B. Witherington, FWC, pers. comm. 2006 (information based on nests monitored throughout Florida beaches in 2005, n=865).

⁴ National Marine Fisheries Service (2001); A. Foley, FWC, pers. comm. 2005.

⁵ Mrosovsky (1988); Marcovaldi et al. (1997).

⁶ B. Witherington, FWC, pers. comm. 2006 (information based on nests monitored throughout Florida beaches in 2005, n=1,680).

⁷ Murphy and Hopkins (1984); Frazer and Richardson (1985); Ehrhart, unpublished data.

⁸ Caldwell (1962), Dodd (1988).

⁹ Richardson et al. (1978); Bjorndal et al. (1983); Ehrhart, unpublished data.

¹⁰ M. Snover, NMFS, pers. comm. 2005.

¹¹ Dahlen et al. (2000).

Loggerheads nest on ocean beaches and occasionally on estuarine shorelines with suitable sand. Nests are typically laid between the high tide line and the dune front (Routa 1968, Witherington 1986, Hailman and Elowson 1992). Wood and Bjorndal (2000) evaluated four environmental factors (slope, temperature, moisture, and salinity) and found that slope had the greatest influence on loggerhead nest-site selection. Loggerheads appear to prefer relatively narrow, steeply sloped, coarse-grained beaches, although nearshore contours may also play a role in nesting beach site selection (Provancha and Ehrhart 1987).

Sea turtle eggs require a high-humidity substrate that allows for sufficient gas exchange for development (Miller 1997, Miller et al. 2003). Loggerhead nests incubate for variable periods of time. The length of the incubation period (commonly measured from the time of egg deposition to hatchling emergence) is inversely related to nest temperature, such that between 26°C and 32°C, a change of 1°C adds or subtracts approximately 5 days (Mrosovsky 1980).

The warmer the sand surrounding the egg chamber, the faster the embryos develop (Mrosovsky and Yntema 1980). Sediment temperatures prevailing during the middle third of the incubation period also determine the sex of hatchling sea turtles (Mrosovsky and Yntema 1980). Incubation temperatures near the upper end of the tolerable range produce only female hatchlings while incubation temperatures near the lower end of the tolerable range produce only male hatchlings. The pivotal temperature (i.e., the incubation temperature that produces equal numbers of males and females) in loggerheads is approximately 29°C (Limpus et al. 1983, Mrosovsky 1988, Marcovaldi et al. 1997). However, clutches with the same average temperature may have different sex ratios depending on the fluctuation of temperature during incubation (Georges et al. 1994). Moisture conditions in the nest similarly influence incubation period, hatching success, and hatchling size (McGehee 1990, Carthy et al. 2003).

Loggerhead hatchlings pip and escape from their eggs over a 1- to 3-day interval and move upward and out of the nest over a 2- to 4-day interval (Christens 1990). The time from pipping to emergence ranges from 4 to 7 days with an average of 4.1 days (Godfrey and Mrosovsky 1997). Hatchlings emerge from their nests en masse almost exclusively at night, and presumably using decreasing sand temperature as a cue (Hendrickson 1958, Mrosovsky 1968, Witherington et al. 1990). Moran et al. (1999) concluded that a lowering of sand temperatures below a critical threshold, which most typically occurs after nightfall, is the most probable trigger for hatchling emergence from a nest. After an initial emergence, there may be secondary emergences on subsequent nights (Carr and Ogren 1960, Witherington 1986, Ernest and Martin 1993).

Hatchlings use a progression of orientation cues to guide their movement from the nest to the marine environments where they spend their early years (Lohmann and Lohmann 2003). Hatchlings first use light cues to find the ocean. On naturally lighted beaches without artificial lighting, ambient light from the open sky creates a relatively bright horizon compared to the dark silhouette of the dune and vegetation landward of the nest. This contrast guides the hatchlings to the ocean (Daniel and Smith 1947, Limpus 1971, Salmon et al. 1992, Witherington 1997, Witherington and Martin 1996).

Green Sea Turtle

Green turtles deposit from one to nine clutches within a nesting season, but the overall average is about 3.3 nests. The interval between nesting events within a season varies around a mean of about 13 days (Hirth 1997). Mean clutch size varies widely among populations. Average clutch size reported for Florida was 136 eggs in 130 clutches (Witherington and Ehrhart 1989). Only occasionally do females produce clutches in successive years. Usually two, three, four or more years intervene between breeding seasons (NMFS and Service 1991a). Age at sexual maturity is believed to be 20 to 50 years (Hirth 1997).

Leatherback Sea Turtle

Leatherbacks nest an average of five to seven times within a nesting season, with an observed maximum of 11 nests (NMFS and Service 1992). The interval between nesting events within a season is about 9 to 10 days. Clutch size averages 80 to 85 yolked eggs, with the addition of usually a few dozen smaller, yolkless eggs, mostly laid toward the end of the clutch (Pritchard 1992). Nesting migration intervals of 2 to 3 years were observed in leatherbacks nesting on the Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands (McDonald and Dutton 1996). Leatherbacks are believed to reach sexual maturity in 6 to 10 years (Zug and Parham 1996).

Hawksbill Sea Turtle

Hawksbills nest on average about 4.5 times per season at intervals of approximately 14 days (Corliss et al. 1989). In Florida and the U.S. Caribbean, clutch size is approximately 140 eggs, although several records exist of over 200 eggs per nest (NMFS and Service 1993). On the basis of limited information, nesting migration intervals of 2 to 3 years appear to predominate. Hawksbills are recruited into the reef environment at about 14 inches in length and are believed to begin breeding about 30 years later. However, the time required to reach 14 inches in length is unknown and growth rates vary geographically. As a result, actual age at sexual maturity is unknown.

Kemp's Ridley Sea Turtle

Nesting occurs from April into July during which time the turtles appear off the Tamaulipas and Veracruz coasts of Mexico. Precipitated by strong winds, the females swarm to mass nesting emergences, known as *arribadas* or *arribazones*, to nest during daylight hours. The period between Kemp's ridley *arribadas* averages approximately 25 days (Rostal et al. 1997), but the precise timing of the *arribadas* is highly variable and unpredictable (Bernardo and Plotkin 2007). Clutch size averages 100 eggs and eggs typically take 45 to 58 days to hatch depending on temperatures (Marquez-M. 1994, Rostal 2007).

Some females breed annually and nest an average of 1 to 4 times in a season at intervals of 10 to 28 days. Analysis by Rostal (2007) suggested that ridley females lay approximately 3.075 nests per nesting. Interannual remigration rate for female ridleys is estimated to be approximately 1.8 (Rostal 2007) to 2.0 years (Marquez Millan et al. 1989, TEWG 2000). Age at sexual maturity is believed to be between 10 to 17 years (Snover et al. (2007).

Population dynamics

Loggerhead Sea Turtle

The loggerhead occurs throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. However, the majority of loggerhead nesting is at the western rims of the Atlantic and Indian Oceans. The most recent reviews show that only two loggerhead nesting beaches have greater than 10,000 females nesting per year (Baldwin et al. 2003, Ehrhart et al.

2003, Kamezaki et al. 2003, Limpus and Limpus 2003, Margaritoulis et al. 2003): South Florida (U.S.) and Masirah (Oman). Those beaches with 1,000 to 9,999 females nesting each year are Georgia through North Carolina (U.S.), Quintana Roo and Yucatán (Mexico), Cape Verde Islands (Cape Verde, eastern Atlantic off Africa), and Western Australia (Australia). Smaller nesting aggregations with 100 to 999 nesting females annually occur in the Northern Gulf of Mexico (U.S.), Dry Tortugas (U.S.), Cay Sal Bank (Bahamas), Sergipe and Northern Bahia (Brazil), Southern Bahia to Rio de Janeiro (Brazil), Tongaland (South Africa), Mozambique, Arabian Sea Coast (Oman), Halaniyat Islands (Oman), Cyprus, Peloponnesus (Greece), Island of Zakynthos (Greece), Turkey, Queensland (Australia), and Japan.

The loggerhead is commonly found throughout the North Atlantic including the Gulf of Mexico, the northern Caribbean, the Bahamas archipelago, and eastward to West Africa, the western Mediterranean, and the west coast of Europe.

The major nesting concentrations in the U.S. are found in South Florida. However, loggerheads nest from Texas to Virginia. Total estimated nesting in the U.S. has fluctuated between 47,000 and 90,000 nests per year over the last decade (FWC, unpublished data; GDNR, unpublished data; SCDNR, unpublished data; NCWRC, unpublished data). About 80% of loggerhead nesting in the southeast U.S. occurs in six Florida counties (Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties). Adult loggerheads are known to make considerable migrations between foraging areas and nesting beaches (Schroeder et al. 2003, Foley et al. in press). During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S. and throughout the Gulf of Mexico, Bahamas, Greater Antilles, and Yucatán.

From a global perspective, the U.S. nesting aggregation is of paramount importance to the survival of the species and is second in size only to that which nests on islands in the Arabian Sea off Oman (Ross 1982, Ehrhart 1989). The status of the Oman loggerhead nesting population, reported to be the largest in the world (Ross 1979), is uncertain because of the lack of long-term standardized nesting or foraging ground surveys and its vulnerability to increasing development pressures near major nesting beaches and threats from fisheries interaction on foraging grounds and migration routes (E. Possardt, Service, personal communication 2005). The loggerhead nesting aggregations in Oman, the U.S., and Australia account for about 88% of nesting worldwide (NMFS and Service 1991b).

Green Sea Turtle

About 150 to 3,000 females are estimated to nest on beaches in the continental U.S. annually (FWC 2005). In the U.S. Pacific, over 90 percent of nesting throughout the Hawaiian archipelago occurs at the French Frigate Shoals, where about 200 to 700 females nest each year (NMFS and Service 1998a). Elsewhere in the U.S. Pacific, nesting takes place at scattered locations in the Commonwealth of the Northern Marianas, Guam, and American Samoa. In the western Pacific, the largest green turtle nesting aggregation in the world occurs on Raine

Island, Australia, where thousands of females nest nightly in an average nesting season (Limpus et al. 1993). In the Indian Ocean, major nesting beaches occur in Oman where 30,000 females are reported to nest annually (Ross and Barwani 1995).

Leatherback Sea Turtle

A dramatic drop in nesting numbers has been recorded on major nesting beaches in the Pacific. Spotila et al. (2000) have highlighted the dramatic and possible extirpation of leatherbacks in the Pacific.

The East Pacific and Malaysia leatherback populations have collapsed. Spotila et al. (1996) estimated that only 34,500 females nested annually worldwide in 1995, which is a dramatic decline from the 115,000 estimated in 1980 (Pritchard 1982). In the eastern Pacific, the major nesting beaches occur in Costa Rica and Mexico. At Playa Grande, Costa Rica, considered the most important nesting beach in the eastern Pacific, numbers have dropped from 1,367 leatherbacks in 1988-1989 to an average of 188 females nesting between 2000-2001 and 2003-2004. In Pacific Mexico, in 1982 through aerial surveys of adult female leatherbacks this area became the most important leatherback nesting beach in the world. Tens of thousands of nests were laid on the beaches in 1980s but during the 2003-2004 seasons a total of 120 nests was recorded. In the western Pacific, the major nesting beaches lie in Papua New Guinea, Papua, Indonesia, and the Solomon Islands. These are some of the last remaining significant nesting assemblages in the Pacific. Compiled nesting data estimated approximately 5,000-9,200 nests annually with 75% of the nests being laid in Papua, Indonesia.

However, the most recent population size estimate for the North Atlantic alone is a range of 34,000-94,000 adult leatherbacks (Turtle Expert Working Group 2007). In Florida, an increase in leatherback nesting numbers from 98 nests in 1989 to between 800 and 900 nests in the early 2000s has been documented.

Nesting in the Southern Caribbean occurs in the Guianas (Guyana, Suriname, and French Guiana), Trinidad, Dominica, and Venezuela. The largest nesting populations at present occur in the western Atlantic in French Guiana with nesting varying between approximately 5,029 and 63,294 nests between 1967 and 2005 (Turtle Expert Working Group 2007). Trinidad supports an estimated 6,000 leatherbacks nesting annually, which represents more than 80% of the nesting in the insular Caribbean Sea. Leatherback nesting along the Caribbean Central American coast takes place between the Honduras and Colombia. In Atlantic Costa Rica, at Tortuguero the number of nests laid annually between 1995 and 2006 was estimated to range from 199-1,623; modeling of these data indicated that the nesting population has decreased by 67.8% over this time period.

In Puerto Rico, the main nesting areas are at Fajardo on the main island of Puerto Rico and on the island of Culebra. Between 1978 and 2005, nesting increased in Puerto Rico with a minimum of 9 nests recorded in 1978 and a minimum of 469-882 nests recorded each year

between 2000 and 2005. Recorded leatherback nesting on the Sandy Point National Wildlife Refuge on the island of St. Croix, U.S. Virgin Islands between 1990 and 2005, ranged from a low of 143 in 1990 to a high of 1,008 in 2001. In the British Virgin Islands, annual nest numbers have increased in Tortola from 0-6 nests per year in the late 1980s to 35-65 nests per year in the 2000s.

The most important nesting beach for leatherbacks in the eastern Atlantic lies in Gabon, Africa. It was estimated there were 30,000 nests along 60 miles (96.5 km) of Mayumba Beach in southern Gabon during the 1999 - 2000 nesting season. Some nesting has been reported in Mauritania, Senegal, the Bijagos Archipelago of Guinea-Bissau, Turtle Islands and Sherbro Island of Sierra Leone, Liberia, Togo, Benin, Nigeria, Cameroon, Sao Tome and Principe, continental Equatorial Guinea, Islands of Corisco in the Gulf of Guinea and the Democratic Republic of the Congo, and Angola. A larger nesting population is found on the island of Bioko (Equatorial Guinea).

Hawksbill Sea Turtle

About 15,000 females are estimated to nest each year throughout the world with the Caribbean accounting for 20 to 30 percent of the world's hawksbill population. Only five regional populations remain with more than 1,000 females nesting annually (Seychelles, Mexico, Indonesia, and two in Australia) (Meylan and Donnelly 1999). Mexico is now the most important region for hawksbills in the Caribbean with about 3,000 nests/year (Meylan 1999). Other significant but smaller populations in the Caribbean still occur in Martinique, Jamaica, Guatemala, Nicaragua, Grenada, Dominican Republic, Turks and Caicos Islands, Cuba, Puerto Rico, and U.S. Virgin Islands. In the U.S. Caribbean, about 150 to 500 nests per year are laid on Mona Island, Puerto Rico and 70 to 130 nests/year are laid on Buck Island Reef National Monument, U.S. Virgin Islands. In the U.S. Pacific, hawksbills nest only on main island beaches in Hawaii, primarily along the east coast of the island of Hawaii. Hawksbill nesting has also been documented in American Samoa and Guam (NMFS and Service 1998b).

Kemp's Ridley Sea Turtle

Most Kemp's ridleys nest on the coastal beaches of the Mexican states of Tamaulipas and Veracruz, although a small number of Kemp's ridleys nest consistently along the Texas coast (Turtle Expert Working Group 1998). In addition, rare nesting events have been reported in Alabama, Florida, Georgia, South Carolina, and North Carolina. Historic information indicates that tens of thousands of ridleys nested near Rancho Nuevo, Mexico, during the late 1940s (Hildebrand 1963). The Kemp's ridley population experienced a devastating decline between the late 1940s and the mid 1980s. The total number of nests per nesting season at Rancho Nuevo remained below 1,000 throughout the 1980s, but gradually began to increase in the 1990s. In 2007, 11,268 nests were documented along the 18.6 miles (30 km) of coastline patrolled at Rancho Nuevo, and the total number of nests documented for all the monitored beaches in Mexico was 15,032 (Service 2007c). During the 2007 nesting season, an arribada

with an estimated 5,000 turtles was recorded at Rancho Nuevo from May 20 to May 23. In addition, 128 nests were recorded during 2007 in the U.S., primarily in Texas.

Status and Distribution

Loggerhead Sea turtle

Genetic research involving analysis of mitochondrial DNA has identified five different loggerhead subpopulations/nesting aggregations in the western North Atlantic: (1) the Northern Subpopulation occurring from North Carolina to around Cape Canaveral, Florida (about 29° N.); (2) South Florida Subpopulation occurring from about 29° N. on Florida's east coast to Sarasota on Florida's west coast; (3) Dry Tortugas, Florida, Subpopulation, (4) Northwest Florida Subpopulation occurring at Eglin Air Force Base and the beaches near Panama City; and (5) Yucatán Subpopulation occurring on the eastern Yucatán Peninsula, Mexico (Bowen 1994, 1995; Bowen et al. 1993; Encalada et al. 1998; Pearce 2001). These data indicate that gene flow between these five regions is very low. If nesting females are extirpated from one of these regions, regional dispersal will not be sufficient to replenish the depleted nesting subpopulation.

The Northern Subpopulation had an average of 5,151 nests per year from 1989-2005 (Georgia Department of Natural Resources, unpublished data; North Carolina Wildlife Resources Commission, unpublished data; South Carolina Department of Natural Resources, unpublished data). Standardized ground surveys of 11 North Carolina, South Carolina, and Georgia nesting beaches showed a significant declining trend of 1.9% annually in loggerhead nesting from 1983-2005 (M. Dodd, Georgia Department of Natural Resources, personal communication 2006; M. Godfrey, North Carolina Wildlife and Marine Resources Commission, personal communication 2006; S. Murphy, South Carolina Department of Natural Resources, personal communication 2006). In addition, standardized aerial nesting surveys in South Carolina have shown a significant annual decrease of 3.1% from 1980-2002 (South Carolina Department of Natural Resources, unpublished data).

An analysis of Florida's long-term loggerhead sea turtle nesting data, carried out as part of the FWC's Index Nesting Beach Survey (INBS) program (its purpose is to measure seasonal productivity, allowing comparisons between beaches and between years.), reveals a decline in loggerhead nest numbers around the state. Nest counts have decreased nearly 50 percent from 1998 to 2007. The precipitous decline in loggerhead nest numbers has followed a modest increase that occurred between 1989 and 1998. Between 1989 and 2007, the overall trend in loggerhead nesting is down approximately 37 percent. Data collected during the 2007 Statewide Nesting Beach Survey (SNBS) program (its purpose is to document the total distribution, seasonality and abundance of sea turtle nesting in Florida) indicate the lowest nesting levels in Florida in the 19-year history of this monitoring program (45,084 nests).

A near complete census of the Florida Panhandle Subpopulation undertaken from 1995 to 2006 reveals a mean of 910 nests per year, which equates to about 222 females nesting per year

(FWC Statewide Nesting Beach Survey database). However, preliminary analysis for 11 years (1995 to 2005) of INBS data for the Florida Panhandle subpopulation shows a declining trend (B. Witherington, FWC, personal communication 2007).

A near complete census of the Dry Tortugas Subpopulation undertaken from 1995 to 2004, excluding 2002 (9 years surveyed), reveals a mean of 246 nests per year, which equates to about 60 females nesting per year (FWC Statewide Nesting Beach Survey database). The trend data for the Dry Tortugas Subpopulation are from beaches that are not included in Florida's INBS program, but have moderately good monitoring consistency. There are 9 years of data for this Subpopulation, but the time series is too short to detect a trend (B. Witherington, FWC, personal communication 2007).

The Yucatán Nesting Subpopulation (occurring in the eastern Yucatán Peninsula in Mexico) had a range of 903-2,331 nests from 1987-2001 along the central coast of Quintana Roo (Zurita *et al.* 2003). Zurita *et al.* (2003) reported a statistically significant increase in the number of nests laid on seven of the beaches in Quintana Roo, Mexico, from 1987-2001 where survey effort was consistent during the period. However, nesting since 2001 has declined and the previously reported increasing trend appears to have not been sustained (J. Zurita, personal communication 2006).

Recovery Criteria

The southeastern U.S. loggerhead population can be considered for delisting when, over a period of 25 years, the following conditions are met:

1. The adult female population in Florida is increasing and in North Carolina, South Carolina, and Georgia, it has returned to pre-listing levels (NC - 800, SC - 10,000, and GA - 2,000 nests per season). The above conditions shall be met with the data from standardized surveys, which would continue for at least five years after delisting.
2. At least 25 percent (348 miles) of all available nesting beaches (1,400 miles) are in public ownership, distributed over the entire nesting range and encompassing at least 50 percent of the nesting activity in each state.
3. All priority one tasks identified in the recovery plan have been successfully implemented.

The Recovery Plan for the loggerhead sea turtle is currently under revision. An initial recovery plan for the loggerhead turtle was approved on September 19, 1984. This initial plan was a multi-species plan for all six species of sea turtles occurring in the U.S. On December 26, 1991, a separate recovery plan for the U.S. Atlantic population of the loggerhead turtle was approved. Since approval of the first revised plan in 1991, significant research has been

accomplished and important conservation and recovery activities have been undertaken. As a result, we have a greater knowledge of the species and its status. Thus, a revision of the Recovery Plan was drafted and distributed for public comment on May 30, 2008 (73 FR 31066). Comments are requested by July 29, 2008.

The Service and NMFS completed a five-year status review of the loggerhead sea turtle in August 2007 (NMFS and Service 2007a). A recommendation has been made to determine the application of the Distinct Population Segment (DPS) policy for the species. A DPS is a population segment that is discrete in relation to the remainder of the species to which it belongs, and significant to the species to which it belongs. NMFS and the Service have established a Biological Review Team to assess the loggerhead population structure globally to determine whether DPSs exist and assess the status of each DPS. The Biological Review Team is in the process of reviewing and synthesizing information and will ultimately render an expert opinion in a written report. This report is anticipated to be completed in 2009.

Green Turtle

Nesting data collected as part of the Florida SNBS program (2000-2006) show that a mean of approximately 5,600 nests are laid each year in Florida. Nesting occurs in 26 counties with a peak along the east coast, from Volusia through Broward Counties. The green turtle nesting population of Florida appears to be increasing based on 19 years (1989-2007) of INBS data from throughout the state. The increase in nesting in Florida is likely a result of several factors, including: (1) a Florida statute enacted in the early 1970s that prohibited the killing of green turtles in Florida; (2) the species listing under the ESA in 1973, affording complete protection to eggs, juveniles, and adults in all U.S. waters; (3) the passage of Florida's constitutional net ban amendment in 1994 and its subsequent enactment, making it illegal to use any gillnets or other entangling nets in state waters; (4) the likelihood that the majority of Florida adult green turtles reside within Florida waters where they are fully protected; (5) the protections afforded Florida green turtles while they inhabit the waters of other nations that have enacted strong sea turtle conservation measures (e.g., Bermuda); and (6) the listing of the species on Appendix I of CITES, which stopped international trade and reduced incentives for illegal trade from the U.S.

Recovery Criteria

The U.S. Atlantic population of green sea turtles can be considered for delisting when, over a period of 25 years the following conditions are met:

1. The level of nesting in Florida has increased to an average of 5,000 nests per year for at least six years. Nesting data shall be based on standardized surveys.
 2. At least 25 percent (65 miles) of all available nesting beaches (260 miles) are in public ownership and encompass at least 50 percent of the nesting activity.
-

3. A reduction in stage class mortality is reflected in higher counts of individuals on foraging grounds.
4. All priority one tasks identified in the recovery plan have been successfully implemented.

The current "Recovery Plan for the U.S. Population of Atlantic Green Turtle (*Chelonia mydas*)" was completed in 1991, the Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*)" was completed in 1998, and the "Recovery Plan for U.S. Pacific Populations of the East Pacific Green Turtle (*Chelonia mydas*)" was completed in 1998. The recovery criteria contained in the plans, while not strictly adhering to all elements of the Recovery Planning Guidelines (Service and NOAA), are a viable measure of the species status.

The Service and NMFS completed a five-year status review of the green sea turtle in August 2007 (NMFS and Service 2007b). A recommendation has been made to conduct an analysis and review of the species to determine the application of the Distinct Population Segment (DPS) policy for the species. A DPS is a population segment that is discrete in relation to the remainder of the species to which it belongs, and significant to the species to which it belongs. Since the species' listing, a substantial amount of information has become available on population structure (through genetic studies) and distribution (through telemetry, tagging, and genetic studies). The data has not been fully assembled or analyzed; however, at a minimum, these data appear to indicate a possible separation of populations by ocean basins.

Leatherback Sea Turtle

Declines in leatherback nesting have occurred over the last two decades along the Pacific coasts of Mexico and Costa Rica. The Mexican leatherback nesting population, once considered to be the world's largest leatherback nesting population (historically estimated to be 65 percent of worldwide population), is now less than one percent of its estimated size in 1980. Spotila et al. (1996) estimated the number of leatherback sea turtles nesting on 28 beaches throughout the world from the literature and from communications with investigators studying those beaches. The estimated worldwide population of leatherbacks in 1995 was about 34,500 females on these beaches with a lower limit of about 26,200 and an upper limit of about 42,900. This is less than one third the 1980 estimate of 115,000. Leatherbacks are rare in the Indian Ocean and in very low numbers in the western Pacific Ocean. The largest population is in the western Atlantic. Using an age-based demographic model, Spotila et al. (1996) determined that leatherback populations in the Indian Ocean and western Pacific Ocean cannot withstand even moderate levels of adult mortality and that even the Atlantic populations are being exploited at a rate that cannot be sustained. They concluded that leatherbacks are on the

road to extinction and further population declines can be expected unless action is taken to reduce adult mortality and increase survival of eggs and hatchlings.

In the U.S., nesting populations occur in Florida, Puerto Rico, and the U.S. Virgin Islands. In Florida, the SNBS program has documented an increase in leatherback nesting numbers from 98 nests in 1988 to between 800 and 900 nests per season in the early 2000s (FWC SNBS; Stewart and Johnson 2006). Although the SNBS program provides information on distribution and total abundance statewide, it cannot be used to assess trends because of variable survey effort. Therefore, leatherback nesting trends are best assessed using standardized nest counts made at INBS sites surveyed with constant effort over time (1989-2007). An analysis of the INBS data has shown a substantial increase in leatherback nesting in Florida since 1989 (FWC INBS; Turtle Expert Working Group 2007).

Recovery Criteria

The U.S. Atlantic population of leatherbacks can be considered for delisting when the following conditions are met:

1. The adult female population increases over the next 25 years, as evidenced by a statistically significant trend in the number of nests at Culebra, Puerto Rico, St. Croix, U.S. Virgin Island, and along the east coast of Florida.
2. Nesting habitat encompassing at least 75 percent of nesting activity in U.S. Virgin Islands, Puerto Rico, and Florida is in public ownership.
3. All priority one tasks identified in the recovery plan have been successfully implemented.

The current "Recovery Plan for the Leatherback Turtles (*Dermochelys coriacea*)" in the U.S. Caribbean, Atlantic, and Gulf of Mexico" was signed in 1992 and the "Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (*Dermochelys coriacea*)" was signed in 1998. The recovery criteria contained in the plans, while not strictly adhering to all elements of the Recovery Planning Guidelines (Service and NOAA), are a viable measure of the species status.

The Service and the National Marine Fisheries Service completed a five-year status review of the leatherback sea turtle in August 2007 (NMFS and Service 2007c). A recommendation has been made to conduct an analysis and review of the species to determine the application of the Distinct Population Segment (DPS) policy for the species. A DPS is a population segment that is discrete in relation to the remainder of the species to which it belongs, and significant to the species to which it belongs. Since the species' listing, a substantial amount of information has become available on population structure (through genetic studies) and distribution (through telemetry, tagging, and genetic studies). The data has not been fully assembled or analyzed; however, at a minimum, these data appear to indicate a possible separation of populations by ocean basins.

Hawksbill Sea Turtle

The hawksbill sea turtle has experienced global population declines of 80 percent or more during the past century and continued declines are projected (Meylan and Donnelly 1999). Most populations are declining, depleted, or remnants of larger aggregations. Hawksbills were previously abundant, as evidenced by high-density nesting at a few remaining sites and by trade statistics.

Recovery Criteria

The U.S. Atlantic population of hawksbills can be considered for delisting when the following conditions are met:

1. The adult female population is increasing, as evidenced by a statistically significant trend in the annual numbers of nests on at least five index beaches, including Mona Island and Buck Island Reef National Monument (BIRNM).
2. Habitat for at least 50 percent of the nesting activity that occurs in the U.S. Virgin Islands (USVI) and Puerto Rico is protected in perpetuity.
3. Numbers of adults, subadults, and juveniles are increasing, as evidenced by a statistically significant trend on at least five key foraging areas within Puerto Rico, USVI, and Florida.
4. All priority one tasks identified in the recovery plan have been successfully implemented.

Kemp's Ridley Sea Turtle

Today, under strict protection, the population appears to be in the early stages of recovery. The recent nesting increase can be attributed to full protection of nesting females and their nests in Mexico resulting from a bi-national effort between Mexico and the U.S. to prevent the extinction of the Kemp's ridley, and the requirement to use Turtle Excluder Devices (TEDs) in shrimp trawls both in the United States and Mexico.

The Mexico government also prohibits harvesting and is working to increase the population through more intensive law enforcement, by fencing nest areas to diminish natural predation, and by relocating most nests into corrals to prevent poaching and predation. While relocation of nests into corrals is currently a necessary management measure, this relocation and concentration of eggs into a "safe" area is of concern since it makes the eggs more susceptible to reduced viability.

Recovery Criteria

The goal of the recovery plan is for the species to be reduced from endangered to threatened status. The Recovery Team members feel that the criteria for a complete removal of this species from the endangered species list need not be considered now, but rather left for future revisions of the plan. Complete removal from the federal list would certainly necessitate that some other instrument of protection, similar to the Marine Mammal Protection Act, be in place and be international in scope. Kemp's ridley can be considered for reclassification to threatened status when the following four criteria are met:

1. Protection of the known nesting habitat and the water adjacent to the nesting beach (concentrating on the Rancho Nuevo area) and continuation of the bi-national project.
2. Elimination of the mortality from incidental catch from commercial shrimping in the U.S. and Mexico through the use of TEDs and full compliance with the regulations requiring TED use.
3. Attainment of a population of at least 10,000 females nesting in a season.
4. All priority one recovery tasks in the recovery plan are successfully implemented.

The current Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) was signed in 1992. Significant new information on the biology and population status of Kemp's ridley has become available since 1992. Consequently, a full revision of the recovery plan has been undertaken by the Service and NMFS and is nearing completion. The revised plan will provide updated species biology and population status information, objective and measurable recovery criteria, and updated and prioritized recovery actions. The Service and NMFS completed a five-year status review of the Kemp's ridley sea turtle in August 2007 (NMFS and Service 2007d). Recommendations provided in the five-year review focused on the protection of the species both in the water (enforcement of TED use) and on land (nesting habitat).

Common threats to sea turtles in Florida

Anthropogenic (human) factors that impact hatchlings and adult female turtles on land, or the success of nesting and hatching include: beach erosion, armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, feral hogs, dogs, and an increased presence of native species (e.g., raccoons, armadillos, and opossums), which raid and

feed on turtle eggs. Although sea turtle nesting beaches are protected along large expanses of the western North Atlantic coast, other areas along these coasts have limited or no protection.

Anthropogenic threats in the marine environment include oil and gas exploration and transportation; marine pollution; underwater explosions; hopper dredging, offshore artificial lighting; power plant entrainment and/or impingement; entanglement in debris; ingestion of marine debris; marina and dock construction and operation; boat collisions; poaching and fishery interactions.

Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor, particularly for green turtles. This disease has seriously impacted green turtle populations in Florida, Hawaii, and other parts of the world. The tumors interfere with swimming, eating, breathing, vision, and reproduction, and turtles with heavy tumor burdens may die.

Coastal Development

Loss of nesting habitat related to coastal development has had the greatest impact on nesting sea turtles in Florida. Beachfront development not only causes the loss of suitable nesting habitat, but can result in the disruption of powerful coastal processes accelerating erosion and interrupting the natural shoreline migration (National Research Council 1990b). This may in turn cause the need to protect upland structures and infrastructure by armoring, groin placement, beach emergency berm construction and repair, and beach nourishment which cause changes in, additional loss or impact to the remaining sea turtle habitat.

Hurricanes

Hurricanes were probably responsible for maintaining coastal beach habitat upon which sea turtles depend through repeated cycles of destruction, alteration, and recovery of beach and dune habitat. Hurricanes generally produce damaging winds, storm tides and surges, and rain and can result in severe erosion of the beach and dune systems. Overwash and blowouts are common on barrier islands. Hurricanes and other storms can result in the direct or indirect loss of sea turtle nests, either by erosion or washing away of the nests by wave action or inundation or "drowning" of the eggs or hatchlings developing within the nest or indirectly by loss of nesting habitat. Depending on their frequency, storms can affect sea turtles on either a short-term basis (nests lost for one season and/or temporary loss of nesting habitat) or long term, if frequent (habitat unable to recover). How hurricanes affect sea turtle nesting also depends on its characteristics (winds, storm surge, rainfall), the time of year (within or outside of the nesting season), and where the northeast edge of the hurricane crosses land.

Because of the limited remaining nesting habitat, frequent or successive severe weather events could threaten the ability of certain sea turtle populations to survive and recover. Sea turtles evolved under natural coastal environmental events such as hurricanes. The extensive amount

of pre-development coastal beach and dune habitat allowed sea turtles to survive even the most severe hurricane events. It is only within the last 20 to 30 years that the combination of habitat loss to beachfront development and destruction of remaining habitat by hurricanes has increased the threat to sea turtle survival and recovery. On developed beaches, typically little space remains for sandy beaches to become re-established after periodic storms. While the beach itself moves landward during such storms, reconstruction or persistence of structures at their pre-storm locations can result in a major loss of nesting habitat.

The 2004 hurricane season was the most active storm season in Florida since weather records began in 1851. Hurricanes Charley, Frances, Ivan, and Jeanne, along with Tropical Storm Bonnie, damaged the beach and dune system, upland structures and properties, and infrastructure in the majority of Florida's coastal counties. The cumulative impact of these storms exacerbated erosion conditions throughout the state.

The 2005 hurricane season was a record-breaking season with 27 named storms. Hurricanes Dennis, Katrina, Ophelia, Rita, and Wilma, and Tropical Storms Arlene and Tammy impacted Florida. The cumulative impact of these storms exacerbated erosion conditions in south and northwest Florida.

Erosion

The designation of a Critically Eroded Beach is a planning requirement of the State's Beach Erosion Control Funding Assistance Program. A segment of beach shall first be designated as critically eroded in order to be eligible for State funding. A critically eroded area is a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critically eroded areas may also include peripheral segments or gaps between identified critically eroded areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects (FDEP 2005). It is important to note, that for an erosion problem area to be critical, there shall exist a threat to or loss of one of four specific interests – upland development, recreation, wildlife habitat, or important cultural resources. The total of critically eroded beaches statewide in Florida for 2007 is 388 miles of 497 miles of shoreline. Seventy-eight (78) percent of the State's shoreline is considered to be critically eroded.

Beachfront Lighting

Artificial beachfront lighting may cause disorientation (loss of bearings) and misorientation (incorrect orientation) of sea turtle hatchlings. Visual signs are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr 1967; Mrosovsky and Shettleworth 1968; Dickerson and Nelson 1989; Witherington and Bjorndal 1991). Artificial beachfront lighting is

a documented cause of hatchling disorientation and misorientation on nesting beaches (Philibosian 1976; Mann 1977; FWC 2006). The emergence from the nest and crawl to the sea is one of the most critical periods of a sea turtle's life. Hatchlings that do not make it to the sea quickly become food for ghost crabs, birds, and other predators or become dehydrated and may never reach the sea. Some types of beachfront lighting attract hatchlings away from the sea while some lights cause adult turtles to avoid stretches of brightly illuminated beach. Research has documented significant reduction in sea turtle nesting activity on beaches illuminated with artificial lights (Witherington 1992). During the 2007 sea turtle nesting season in Florida, over 64,000 turtle hatchlings were documented as being disoriented (Table 4) (FWC/FWRI 2007, http://www.myfwc.com/seaturtle/Lighting/Light_Disorient.htm). Exterior and interior lighting associated with condominiums had the greatest impact causing approximately 42 percent of documented hatchling disorientation/misorientation. Other causes included urban sky glow and street lights (http://www.myfwc.com/seaturtle/Lighting/Light_Disorient.htm).

Table 1. Documented Disorientations along the Florida coast.

Year	Total Number of Hatchling Disorientation Events	Total Number of Hatchlings Involved in Disorientation Events	Total Number of Adult Disorientation Events
2001	743	28,674	19
2002	896	43,226	37
2003	1,446	79,357	18
2004	888	46,487	24
2005	976	41,521	50
2006	1,521	71,798	40
2007	1,410	64,433	25

Predation

Depredation of sea turtle eggs and hatchlings by natural and introduced species occurs on almost all nesting beaches. Depredation by a variety of predators can considerably decrease sea turtle nest hatching success. The most common predators in the southeastern United States are ghost crabs (*Ocypode quadrata*), raccoons (*Procyon lotor*), feral hogs (*Sus scrofa*), foxes (*Urocyon cinereoargenteus* and *Vulpes vulpes*), coyotes (*Canis latrans*), armadillos (*Dasypus novemcinctus*), cats (*Felis catus*), and fire ants (*Solenopsis* spp.) (Dodd 1988, Stancyk 1995). Raccoons are particularly destructive on the Atlantic coast and may take up to 96 percent of all nests deposited on a beach (Davis and Whiting 1977, Hopkins and Murphy 1980, Stancyk et al. 1980, Talbert et al. 1980, Schroeder 1981, Labisky et al. 1986). As nesting habitat dwindles, it

is essential that nest production be naturally maximized so the turtles may continue to exist in the wild.

In response to increasing depredation of sea turtle nests by coyote, fox, hog, and raccoon, multi-agency cooperative efforts have been initiated and are ongoing throughout Florida, particularly on public lands.

Driving on the Beach

The operation of motor vehicles on the beach affects sea turtle nesting by: interrupting a female turtle approaching the beach; headlights disorienting or misorienting emergent hatchlings; vehicles running over hatchlings attempting to reach the ocean; and vehicle tracks traversing the beach which interfere with hatchlings crawling to the ocean. Hatchlings appear to become diverted not because they cannot physically climb out of the rut (Hughes and Caine 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon (Mann 1977). The extended period of travel required to negotiate tire tracks and ruts may increase the susceptibility of hatchlings to dehydration and depredation during migration to the ocean (Hosier et al. 1981). Driving directly above or over incubating egg clutches or on the beach can cause sand compaction which may result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings, decreasing nest success and directly killing pre-emergent hatchlings (Mann 1977, Nelson and Dickerson 1987, Nelson 1988).

The physical changes and loss of plant cover caused by vehicles on dunes can lead to various degrees of instability, and therefore encourage dune migration. As vehicles move either up or down a slope, sand is displaced downward, lowering the trail. Since the vehicles also inhibit plant growth, and open the area to wind erosion, dunes may become unstable, and begin to migrate. Unvegetated sand dunes may continue to migrate across stable areas as long as vehicle traffic continues. Vehicular traffic through dune breaches or low dunes on an eroding beach may cause accelerated rate of overwash and beach erosion (Godfrey et al. 1978). If driving is required, the area where the least amount of impact occurs is the beach between the low and high tide water lines. Vegetation on the dunes can quickly re-establish provided the mechanical impact is removed.

In 1985, the Florida Legislature severely restricted vehicular driving on Florida's beaches, except that which is necessary for cleanup, repair, or public safety. This legislation also allowed an exception for five counties to continue to allow vehicular access on coastal beaches due to the availability of less than 50 percent of its peak user demand for off-beach parking. The counties affected by this exception are Volusia, St. Johns, Gulf, Nassau, and Flagler Counties, as well as limited vehicular access on Walton County beaches for boat launching.

Analysis of the species/critical habitat likely to be affected

The presence of artificial lighting on CCAFS and PAFB has the potential to adversely affect nesting female and hatchling sea turtles. The effects of the proposed action on sea turtles will be considered further in the remaining sections of this biological opinion. Potential effects of the presence of artificial lighting on CCAFS and PAFB include the deterrence of female sea turtles from coming onto the beach to dig nests; harassment of nesting females that results in aborted nesting attempts; harassment in the form of misdirection of females attempting to return to sea

after nesting; mortality of nesting females that are misdirected and end up on coastal highways where they may be struck by vehicles; harassment in the form of misdirection of hatchling turtles as they emerge from the nest and attempt to crawl to the water; and mortality of hatchling turtles that are misdirected and made more vulnerable to predators, desiccation, exhaustion, and automobiles.

Critical habitat has not been designated in the continental United States; therefore, the proposed action would not result in an adverse modification.

ENVIRONMENTAL BASELINE

Status of the species within the action area

Loggerhead Sea Turtle

The loggerhead sea turtle nesting and hatching season for southern Florida Atlantic beaches extends from March 15 through November 30. Incubation ranges from about 45 to 95 days. Between 889 and 1,579 loggerhead nests were deposited annually on PAFB beach from 2000 through 2007. Between 1,195 and 3,395 nests were deposited annually on CCAFS beach from 2000 through 2007.

Green Sea Turtle

The green sea turtle nesting and hatching season for southern Florida Atlantic beaches extends from May 1 through November 30. Incubation ranges from about 45 to 75 days. Between 0 and 51 green turtle nests were deposited annually on PAFB beach from 2000 through 2007. Between 4 and 163 nests were deposited annually on CCAFS beach from 2000 through 2007.

Leatherback Sea Turtle

The leatherback sea turtle nesting and hatching season for Southern Florida Atlantic beaches extends from February 15 through November 15. Incubation ranges from about 55 to 85 days. Between 0 and 3 leatherback turtle nests were deposited annually on PAFB beach from 2000 through 2007. Between 0 and 8 nests were deposited annually on CCAFS beach from 2000 through 2007.

Hawksbill Sea Turtle

The hawksbill sea turtle nesting and hatching season for Southern Florida Atlantic beaches extends from June 1 through December 31. Incubation lasts approximately 60 days. Hawksbill sea turtle nesting is rare and restricted to the southeastern coast of Florida (Volusia through Dade Counties) and the Florida Keys (Monroe County) (Meylan 1992, Meylan *et al.* 1995). However, hawksbill tracks are difficult to differentiate from those of loggerheads and may not be recognized by surveyors. Therefore, surveys in Florida likely underestimate actual hawksbill nesting numbers (Meylan *et al.* 1995). Although no hawksbill nests have ever been recorded in Brevard County, one was reported at the Canaveral National Seashore in Volusia County in 1982 (Meylan *et al.* 1995). Therefore, the potential exists for such an occurrence at CCAFS and PAFB.

EFFECTS OF THE ACTION

Factors to be considered

Direct effects

Artificial lighting can be detrimental to sea turtles in several ways. Field observations have shown a correlation between lighted beaches and reduced loggerhead and green sea turtle nesting (Mortimer 1982, Raymond 1984, Mattison *et al.* 1993). Experimental field work by Witherington (1992a) directly implicated artificial lighting in deterring sea turtles from nesting. In these experiments, both green and loggerhead turtles showed a significant tendency to avoid stretches of beach with artificial lights that have predominantly blue and green wavelengths. Because adult females rely on visual brightness cues to find their way back to the ocean after nesting, those turtles that nest on lighted beaches may be disoriented by artificial lights and have difficulty finding their way back to the ocean. In the lighted-beach experiments described by Witherington (1992a), few nesting turtles returning to the sea were misdirected by lighting; however, those that were, spent a large portion of the night wandering in search of the ocean. In some cases, nesting females have ended up on coastal highways and been struck by vehicles. However, turtles returning to the sea after nesting are not misdirected nearly as often as hatchlings emerging on the same beaches (Witherington and Martin 1996).

Under natural conditions, hatchling sea turtles, which typically emerge from nests at night, move toward the brightest, most open horizon, which is over the ocean. However, when bright light sources are visible on the beach, they become the brightest spot on the horizon and attract hatchlings in the wrong direction, making them more vulnerable to predators, desiccation, entrapment in debris or vegetation, and exhaustion, and often luring them onto roadways and parking lots where they are run over. Artificial lights can also disorient hatchlings once they reach the water. Hatchlings have been observed to exit the surf onto land where lighting is nearby (Daniel and Smith 1947, Carr and Ogren 1960, Witherington 1986). Artificial beachfront lighting from buildings and streetlights is a well documented cause of hatchling disorientation (loss of bearings) and misorientation (incorrect orientation) on nesting beaches (McFarlane 1963, Philibosian, 1976, Mann 1978, Florida Fish and Wildlife Conservation Commission unpubl. data).

Extensive research has demonstrated that visual cues are the primary sea finding mechanism for hatchlings (Carr and Ogren 1960, Ehrenfeld and Carr 1967, Mrosovsky and Carr 1967, Mrosovsky and Shettleworth 1968, Dickerson and Nelson 1989, Witherington and Bjorndal 1991). Loggerhead, green and hawksbill hatchlings demonstrate a strong preference for short-wavelength light (Witherington and Bjorndal 1991, Witherington 1992b). Green and hawksbill turtles were most strongly attracted to light in the near-ultraviolet to yellow region of the spectrum and were weakly attracted or indifferent to orange and red light. Loggerheads were most strongly attracted to light in the near-ultraviolet to green region and showed differing responses to light in the yellow region of the spectrum depending on light intensities. At intensities of yellow light comparable to a full moon or a dawn sky, loggerhead hatchlings showed an aversion response to yellow light sources, but at low, nighttime intensities, loggerheads were weakly attracted to yellow light.

Although the attributes that can make a light source harmful to sea turtles are complex, a simple rule has proven useful in identifying problem lighting: "An artificial light source is likely to

cause problems for sea turtles if light from the source can be seen by an observer standing anywhere on the beach" (Witherington and Martin 1996). If any glowing portion of a luminaire (including the lamp, globe or reflector) is directly visible on the beach, then this source of light is likely to be a problem for sea turtles. But light may also reach the beach indirectly by reflecting off buildings or trees that are visible from the beach. Bright or numerous sources of lights, especially those directed upward, will illuminate sea mist and low clouds, creating a distinct sky glow visible from the beach. Field research suggests natural hatchling dispersal patterns may be disrupted by the glow from heavily lighted coastal areas (Witherington 1991).

Hatchling disorientation and misorientation incidents are well documented on CCAFS and PAFB. A few surveys may be missed during the course of the nesting and hatching season. Since the tracks of hatchlings are easily obscured by rain or windblown sand, the actual number of hatchling disorientation/misorientation incidents may be higher than what is actually observed and reported. Use of a standard monitoring and reporting protocol for disorientations/misorientations and estimating the percentage of all nests laid that produce hatchlings that are misdirected on an annual basis can be useful in assessing the success of light management activities.

Prior to implementation of approved LMPs and an internal light management policy, hatchlings from 4.4 percent of nests laid on CCAFS and Kennedy Space Center/Merritt Island National Wildlife Refuge in 1988 and 0.6 percent in 1989 were estimated to have been disoriented or misoriented by CCAFS lights. Hatchling disorientation and misorientation incidents recorded at PAFB in 1988 and 1989 were 0 and 0 percent, respectively, of all nests laid on PAFB.

Following implementation of approved LMPs and an internal light management policy, hatchlings from 0.005 percent of nests laid on CCAFS and Kennedy Space Center/Merritt Island National Wildlife Refuge in 1998 and 0.007 percent in 1999 were estimated to have been disoriented or misoriented by CCAFS lights. Hatchling disorientation and misorientation incidents recorded at PAFB in 1998 and 1999 were 0 and 0 percent, respectively, of all nests laid on PAFB. In 2005, hatchling and adult disorientation and misorientation incidents recorded at PAFB and CCAFS were 2.3% and 3.3% respectively. In 2006, using the marked sample hatchling disorientation calculation, disorientation recorded at PAFB and CCAFS was 0% and 3% respectively, and in 2007 it was 0% and 2.5% for PAFB and CCAFS respectively.

Prior to implementation of approved LMPs and an internal light management policy, over 4,000 artificial lights were associated with the facilities described above and contributed to the illumination of the nesting beach and light glow affecting CCAFS, PAFB, and adjacent nesting beaches. Incandescent, high pressure sodium, quartz, and mercury vapor lights were commonly used lights at CCAFS and PAFB facilities. These types of lights emit high levels of blue and green wavelengths and consequently present the greatest potential for deterring nesting activities and causing hatchling disorientations and misorientations. Light management at CCAFS and PAFB has resulted in a significant number of lights being converted to low pressure sodium lights, which are monochromatic and emit only yellow wavelengths. Although these lights could still cause some hatchling disorientations or misorientations if they are close to the beach and their lamps, globes, or reflectors are visible from the beach, they are much less likely to adversely impact nesting activities or hatchlings, particularly if they are shielded. In addition, many lights have been eliminated, replaced with cutoff shoebox fixtures, and/or shielded.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any cumulative effects in the project area.

CONCLUSION

After reviewing the current status of the loggerhead, green, leatherback and hawksbill sea turtles, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitat. No critical habitat has been designated for the sea turtles in the continental United States; therefore, none will be affected.

It is our opinion that considering the measures the 45th SW has implemented and will be implementing to minimize direct lighting of the nesting beaches and background lighting glow at CCAFS and PAFB, the proposed project is not likely to jeopardize the continued existence of listed sea turtles. We do, however, believe that adverse impacts to sea turtles will continue from lighting sources essential for human safety and national security at CCAFS and PAFB. We believe the reasonable and prudent measures provided with the incidental take statement below will effectively reduce the take of sea turtles.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the Air Force's 45th SW so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The 45th SW has a continuing duty to regulate the activity covered by this incidental take statement. If the 45th SW (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the 45th SW must report the progress of the

action and its impacts on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i) (3)].

AMOUNT OR EXTENT OF TAKE

The Service has determined that incidental take of hatchlings will be described as the actual number of hatchlings that disoriented/misoriented from surveyed nests (based on hatchling track counts) divided by total number of hatchlings potentially emerging from surveyed nests based on an average hatchling emerging success rate from 2001 through 2005 (72 hatchlings per CCAFS and PAFB).

In addition, the previous method of assessing disorientations/misorientations will be calculated and provided to the Service as well. The previous method was the percentage of disoriented nests (more than four hatchlings tracks were observed disoriented/misoriented) divided by the total number of nests during the nesting season.

The Service anticipates that up to a total of 3 percent of all hatchlings disoriented/misoriented from a representative sample of all surveyed nests (marked) nests (based on hatchling track counts) divided by total number of hatchlings potentially emerging from marked nests based on an average hatchling emerging success rate each hatching season (72 hatchlings per CCAFS and PAFB) and 3 percent of females nesting at each installation (CCAFS and PAFB) during each nesting seasons could be taken as a result of this proposed action. The incidental take is expected to be in the form of hatchling and nesting female disorientations and misorientations. The 45th SW will be held responsible for disorientation or misorientation incidents caused by 45th SW lighting only, including those disorientation and misorientation incidents that might occur on Kennedy Space Center /Merritt Island National Wildlife Refuge as a result of CCAFS lighting. Areas south of kilometer 8 will be attributed to the glow produced by lights at Port Canaveral and nearby towns. Sky glow at PAFB from Cocoa Beach and Satellite beach may account for some disorientations and misorientations at PAFB. PAFB will be held responsible for disorientation or misorientation incidents that might occur on PAFB as a result of PAFB lighting.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of sea turtles.

1. Compliance monitoring shall be conducted to ensure operational constraints of approved LMPs at CCAFS and PAFB and the light management policies at CCAFS and PAFB are being followed.
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2. All new CCAFS and PAFB facilities shall follow the 45th SW Instruction 32-7001. LMPs will be developed, in accordance with the respective light management policies at CCAFS and PAFB for all new facilities that are in close proximity to the beach.
3. Exterior lighting to be replaced at CCAFS and PAFB will use the best available light management technology to minimize sea turtle disorientations.
4. Operational constraints will preclude use of any noncompliant exterior lights between 9 p.m. and dawn from May 1 through October 31, unless essential to support launch-related activities at active launch complexes, safety/security lighting or night operations training.
5. The LC 41 door should be kept closed at night during the sea turtle nesting and hatching season.
6. Nesting surveys and monitoring of beaches for hatchling disorientation or misorientation incidents will continue at CCAFS and PAFB.
7. A minimum of five nighttime lighting surveys will be conducted at CCAFS and five at PAFB during the peak nesting and hatching period (May 1 through October 31) to ensure compliance with the LMPs and existing light management policies.
8. PAFB will continue to work with the Florida Department of Transportation and Brevard County Traffic Authority to minimize impacts from the traffic lights.
9. CCAFS will conduct a sea turtle lighting workshop once every two-years.
10. Calculations of disorientation/misorientation events must be reported on an annual basis following the sea turtle nesting and hatching season.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the 45th SW must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The 45th SW Environmental staff will inspect and record noncompliance and will also be notified of lighting violations by facility managers. Personnel responsible for rectifying violations will be notified by 45th SW Environmental staff on the current procedure, the 45th SW Instruction 32-7001, Exterior Lighting Management, will be followed.
2. All new CCAFS and PAFB facilities shall follow the 45th SW Instruction 32-7001. LMPs will be developed, in accordance with the respective light management policies at CCAFS and PAFB for all new facilities that are in close proximity to the beach.

LMPs must be reviewed and approved by the Service. Lighting directly visible from anywhere on the beach must be shielded and/or recessed so that the point source of light is not directly visible from the beach. No fixtures producing lighting visible from the beach and uplighting will be approved except in mission-critical applications. A letter of justification must be submitted to the 45th SW Environmental Staff with the request for this variance.

3. Exterior lighting at CCAFS and PAFB requiring replacement must be replaced with lighting that is in accordance with the 45 SW Instruction 32-7001. Exterior lighting that is producing lighting/glow visible from the beach will be replaced with full cut off/shielded fixtures to produce downward directed light that does not allow uplighting and minimizes lateral light spread. No fixtures producing lighting/glow visible from the beach and uplighting will be approved except in mission-critical applications. In cases where white lights, visible from the beach, are required for safety and/or security, and color rendition, these lights must be reviewed and approved by the 45th SW Environmental Branch.
4. Operational constraints will preclude use of any noncompliant exterior lights between 9 p.m. and dawn from May 1 through October 31, unless essential to support launch-related activities at active launch complexes, safety/security lighting or night operations training. If incubating nests are still present on the beach after October 31 that could be impacted by particular noncompliant light sources, the 45th SW Environmental Staff will notify facility managers of the visible lighting source. Lighting must be corrected to prevent potential disorientation/ misorientation events in those particular cases.
5. The LC 41 door should be kept closed at night during the nesting and hatching season (May 1 through October 31) except for brief periods as necessary for those periods of time required to support launch activities. If incubating nests are still present on the beach after October 31 that could be impacted by particular noncompliant light sources, the 45th SW Environmental Staff will notify facility managers of the visible lighting source. Lighting must be corrected to prevent potential disorientation/ misorientation events in those particular cases.
6. Surveys will continue annually at CCAFS and PAFB to record nesting activities and hatchling disorientation and misorientation events to evaluate the effectiveness of the LMPs and lighting management policies and identify needed modifications. Survey personnel must be experienced and trained in survey methodology and hold a valid Florida Fish and Wildlife Conservation Commission marine turtle permit.

7. A minimum of five nighttime lighting surveys will be conducted at CCAFS and five at PAFB during the peak nesting and hatching period (May 1 through October 31) to ensure compliance with the LMPs and existing light management policies. Additional lighting surveys will be conducted, as needed, to ensure any lighting violations observed are brought into compliance and to confirm sources of hatchling disorientation that cannot be identified during hatchling disorientation surveys.
8. PAFB will continue to work with the Florida Department of Transportation and Brevard County Traffic Authority to minimize impacts from the traffic lights at the Main Gate and the former Officers' Club/Blockhouse.
9. CCAFS will conduct a sea turtle lighting workshop once every two-years for the engineers, launch complex managers and any other representatives that design and/or enforce lighting at CCAFS and PAFB.
10. Both methods of calculating disorientation/misorientation events must be reported on an annual basis following the sea turtle nesting and hatching season. These methods are as follows:
 - i. Number of hatchlings that disoriented from surveyed nests
Total number of potential hatchlings from surveyed nests
 - ii. Number of surveyed nests that had disorientation hatchling events
Total number of surveyed nest

In the event disoriented or misoriented hatchlings are discovered, the following procedures shall be followed:

1. Live hatchlings shall be maintained in covered, rigid walled containers on moist sand in a building protected from extremes of heat or cold. Hatchlings shall be released after dark on the first night subsequent to the disorientation/misorientation event if their health status permits.
2. A Florida Fish and Wildlife Conservation Commission "Marine Turtle Hatchling Disorientation Incident Report Form" shall be completed for each disorientation/misorientation incident. These forms shall be submitted to the Service's Jacksonville Field Office on a monthly basis.

The Service has determined that up to a total of 3 percent of all disoriented/misoriented from surveyed nests (based on hatchling track counts) divided by total number of hatchlings potentially emerging from surveyed nests based on an average hatchling emerging success rate from each hatching season (72 hatchlings per CCAFS and PAFB) and 3 percent of all females nesting at each installation (CCAFS and PAFB) for each nesting season will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal

agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.


1. The 45th SW should request budgetary funding for dune enhancement and native vegetation plantings to provide additional light screening of beach areas with a history of hatchling disorientation and/or misorientation incidents.
2. Educational information should be provided to personnel where appropriate at beach access points explaining the importance of the area to sea turtles and/or the life history of sea turtle species that nest in the area.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request for reinitiation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. The Service appreciates the cooperation of the Air Force during this consultation. We would like to continue working with you and your staff regarding the lighting at PAFB and CCAFS. For further coordination please contact Ann Marie Lauritsen at (904) 525-0661.

Sincerely,


David L. Hapka
Field Supervisor

APPENDIX C
CONSULTATION WITH
FLORIDA STATE HISTORIC PRESERVATION OFFICE



FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Mr. Thomas E. Penders
Department of the Air Force
45 CES/CEAN
1224 Jupiter Street, MS 9125
Patrick Air Force Base, Florida 32925-3343

November 16, 2011

RE: DHR Project File Number: 2011-3861
Report: An Update and Revision of Three Historic Properties Surveys for Patrick Air Force Base
Patrick Air Force Base, Brevard County

Dear Mr. Penders:

This office reviewed the referenced report in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*.

The submitted report combined the evaluations of three previous building surveys at Patrick Air Force Base, two of which were never submitted to the Division of Historical Resources. The surveys include the "*Evaluation of Eighteen Historic Buildings*" conducted by the US Army Corps of Engineers - Construction Engineering Research Laboratory (CERL) in 1993, the "*Historical and Architectural Documentation Reports of Patrick Air Force Base*" conducted CERL in 1994, and the "*45th Space Wing Historical Building Survey*" conducted by SpecPro, Inc. in 2003.

We have reviewed the submitted report and have made the following determinations of eligibility for listing on the *National Register*.

It is the opinion of this office that the following individual properties appear to meet the criteria for listing on the *National Register*.

926 (8BR2152)
978 (8BR2162)
989 (8BR2136)

It is the opinion of this office that the following historic districts appear to meet the criteria for listing in the *National Register*.

- *Banana River Naval Air Station Seaplane Historic District* (8BR1975): The district consist of five contributing resources: 302 (8BR1970), 303 (8BR1971), 304 (8BR2026), 305 (8BR1972), and 313 (8BR1974).
- *Inert Storage Facility Historic District* (8BR2075): The district consists of three contributing resources: 1322 (8BR2034), 1327 (8BR2035), and 1330 (8BR2036).

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- *High Explosive Storage Facility Historic District* (8BR2076): The district consists of five contributing resources: 1425 (8BR2037), 1432 (8BR2038), 1435 (8BR2039), 1437 (8BR2040), and 1440 (8BR2041).
- *Patrick Air Force Base Missile Instrumentation Station Historic District* (8BR2170): The district consists of three contributing resources: 965 (8BR2150), 969 (8BR2140), and 970 (8BR2141).
- *Bomarc-SAGE Tracking Facility Historic District* (8BR2181): The district consists of three contributing resources: 990 (8BR2179), 991 (8BR2158) and 996 (8BR2159).
- *Patrick Air Force Base Facilities Landplane Historic District* (8BR2438): The district consists of thirteen contributing resources: 630 (8BR2462), 632 (8BR2463), 637 (8BR2464), 647 (8BR2465), 688 (8BR2070), 750 (8BR2137), 751 (8BR2138), 810 (8BR2478), 985 (8BR2155), 986 (8BR2156), 20610 (8BR2499), the Airfield (8BR2439), and Archaeological Site (8BR2477).
- *Patrick Air Force Base Administrative Historic District* (8BR2440): The district consists of nineteen contributing resources: 408 (8BR2044), 410 (8BR2453), 423 (8BR2045), 425 (8BR2046), 431 (8BR2047), 439 (8BR2025), 440 (8BR2177), 530 (8BR2061), 534 (8BR2048), 535 (8BR2049), 536 (8BR2050), 537 (8BR2056), 545 (8BR2063), 556 (8BR2142), 557 (8BR1837), 559 (8BR2064), 560 (8BR2065), 561 (8BR2066), and 562 (8BR2067).
- *South Patrick Housing Administrative Area Historic District* (8BR2504): The district consists of four contributing resources: 3650 (8BR2500), 3655 (8BR2501), 3656 (8BR2502), and 3659 (8BR2503).

It is the opinion of this office that the following properties do not appear to meet the criteria for listing on the *National Register*.

F (BR2441)	513 (8BR2457)	702 (8BR2176)	967 (8BR2486)
203 (8BR2449)	515 (8BR2058)	710 (8BR2072)	981 (8BR2470)
228 (8BR2443)	522 (8BR2059)	720 (8BR2073)	982 (8BR2470)
251 (8BR2444)	523 (8BR2060)	722 (8BR2074)	983 (8BR2470)
253 (8BR2445)	524 (8BR2458)	735 (8BR2151)	984 (8BR2470)
255 (8BR2446)	533 (8BR2062)	739 (8BR2473)	988 (8BR2157)
299 (8BR2447)	600-602 (8BR1973)	761 (8BR2474)	997 (8BR2489)
314 (8BR2042)	623 (8BR2459)	763 (8BR2475)	998 (8BR2490)
315 (8BR2448)	627 (8BR2460)	914 (8BR2479)	1343 (8BR2493)
335 (8BR2043)	629 (8BR2461)	915 (8BR2470)	1350 (8BR2163)
337 (8BR2450)	653 (8BR2466)	922 (8BR2481)	1353 (8BR2164)
372 (8BR2451)	655 (8BR2467)	925 (8BR2437)	1392 (8BR2494)
401 (8BR2148)	673 (8BR2068)	945 (8BR2146)	1394 (8BR2495)
424 (n/a)	675 (8BR2469)	946 (8BR2484)	1480 (8BR2439)
455 (8BR2455)	685 (8BR2069)	948 (8BR2485)	1491 (n/a)
507 (8BR2456)	688 (8BR2070)	957 (8BR2147)	1493 (n/a)
511 (8BR2057)	700 (8BR2071)	961 (8BR2149)	1690 (n/a)



FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Mr. Penders
DHR No. 2011-3861
November 16, 2011
Page 3 of 3

This office would like to compliment you on the thoroughness of the material sent. This is one of the most comprehensive and well documented building inventories we have reviewed.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail sedwards@dos.state.fl.us, or at 850-245-6333.

Sincerely,

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

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FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Mr. Thomas E. Penders
Department of the Air Force
45 CES/CEAN
1224 Jupiter Street, MS 9125
Patrick Air Force Base, Florida 32925-3343

December 15, 2011

RE: DHR Project File Number: 2011-3861-B
Report: An Update and Revision of Three Historic Properties Surveys for Patrick Air Force Base
Patrick Air Force Base, Brevard County

Dear Mr. Penders:

This office reviewed your response letter dated November 29 (which was received in this office on December 7) and has the following comments. Our opinions/determinations are based on the information provided to our office at the time of review. When re-evaluating a resource we take into consideration past evaluations and current knowledge of the resource.

In July 2007, this office determined that Facilities 1432 (8BR2038), 1435 (8BR2039), 1437 (8BR2040), and 1440 (8BR2041), along with the *High Explosive Storage Facility Historic District* (8BR2076) were not eligible for listing on the *National Register*. These four facilities along with Facility 1425 (8BR2037), comprises the *High Explosive Storage Facility Historic District*, were reevaluated in November 2011. Our office determined that they appear to meet the criteria for listing on the *National Register*, under Criteria A for Military and C for Architecture and Engineering. Our current determination was based on current information concerning their history, including their association with the military and on the limited number of this specific type of resources remaining in the State. It is our understanding that all three structures have been documented in accordance with the Historic American Buildings Survey Standards. We look forward to coordinating with your office on the appropriate level of mitigation for the demolition in light of the situation.

In April 2007, this office determined that Facilities 1322 (8BR2034), 1327 (8BR2035), and 1330 (8BR2036), which make up the *Inert Storage Facility Historic District* (8BR2075) were not eligible for listing on the *National Register*. These three facilities along with the resource group/district form were reevaluated in November 2011 and determined to appear to meet the criteria for listing on the *National Register*, under Criteria A for Military and C for Architecture and Engineering. Our determination was based on current information concerning their history, including their association with the military and on the limited number of this specific type of resources remaining in the State. It is our understanding that all three structures have been documented in accordance with the Historic American Buildings Survey Standards and that Facility 1322 (8BR2034) will be preserved in place. We look forward to coordinating with your office on the appropriate level of mitigation for the demolition in light of the situation.

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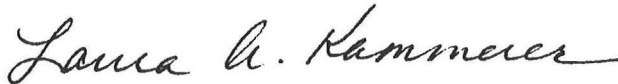
Mr. Penders
DHR No. 2011-3861-B
December 15, 2011
Page 2 of 2

In June 2007, this office determined that Facility 989 (8BR2136) was not eligible for listing on the *National Register*. This facility was reevaluated in November 2011 and determined to appear to meet the criteria for listing on the *National Register*, under Criteria A for Military and C for Architecture and Engineering. Our determination was based on current information concerning its history and involvement with the Cold War. It is our understanding that the building is scheduled for partial demolition in 2014. The original south wing would not be demolished. We look forward to coordinating with your office on the appropriate level of mitigation for the demolition in light of the situation.

For the remaining 22 facilities that are targeted for demolition, you will need to coordinate with our office for each resource (some may be grouped where appropriate) in ensure adequate mitigation has and will take place.

This office would again like to compliment you on the thoroughness of the material sent. If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail scott.edwards@dos.myflorida.com or at 850-245-6333.

Sincerely,

A handwritten signature in cursive script that reads "Laura A. Kammerer".

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance



FLORIDA DEPARTMENT OF STATE
DIVISION OF HISTORICAL RESOURCES

Mr. Thomas E. Penders
Department of the Air Force
45 CES/CEAN
1224 Jupiter Street, MS 9125
Patrick Air Force Base, Florida 32925-3343

February 27, 2012

RE: DHR Project File Number: 2012-669
Demolition of High Explosive Magazines - Facilities 1425, 1432, 1435, 1437, and 1440
Patrick Air Force Base, Brevard County

Dear Mr. Penders:

This office reviewed the referenced projects for possible impact to historic properties listed, or eligible for listing, on the *National Register of Historic Places*. The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*.

In a letter dated July 30, 2007, this office concurred that Facility 1425 (8BR2037), 1432 (8BR2038), 1435 (8BR2039), 1437 (8BR2040), and 1440 (8BR2041), did not appear to meet the criteria for listing on the *National Register*. Based on the 2007 review the Department of the Air Force began procedures for the demolition of the facilities.

This office reevaluated the facilities in November 2011. Based on additional information we determined that they were contributing resources to the *High Explosive Storage Facility Historic District* (8BR2076), which appears to meet the criteria for listing on the *National Register*. The demolition of the facilities will constitute an adverse effect.

However, due to this specific circumstance involving these five facilities we will accept the previously submitted documentation and the proposed additional efforts as mitigation. A Memorandum of Agreement will not be needed in this situation.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail scott.edwards@dos.myflorida.com, or at 850.245.6333 or 800.847.7278.

Sincerely,

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance



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DIVISION OF HISTORICAL RESOURCES

Mr. Thomas E. Penders
Department of the Air Force
45 CES/CEAN
1224 Jupiter Street, MS 9125
Patrick Air Force Base, Florida 32925-3343

February 27, 2012

RE: DHR Project File Number: 2012-667
Demolition of the Inert Storage Facility - Facilities 1322, 1327 and 1330
Patrick Air Force Base, Brevard County

Dear Mr. Penders:

This office reviewed the referenced projects for possible impact to historic properties listed, or eligible for listing, on the *National Register of Historic Places*. The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*.

In a letter dated April 9, 2007, this office concurred that Facility 1322 (8BR2034), 1327 (8BR2035), and 1330 (8BR2036) did not appear to meet the criteria for listing on the *National Register*. Based on the 2007 review the Department of the Air Force began procedures for the demolition of the facilities.

This office reevaluated the facilities in November 2011. Based on additional information we determined that they were contributing resources to the *Inert Storage Facility Historic District* (8BR2075), which appears to meet the criteria for listing on the *National Register*. The demolition of the facilities will constitute an adverse effect.

However, due to this specific circumstance involving these three facilities we will accept the previously submitted documentation and the proposed additional efforts as mitigation. A Memorandum of Agreement will not be needed in this situation.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail scott.edwards@dos.myflorida.com, or at 850.245.6333 or 800.847.7278.

Sincerely,

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance



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DIVISION OF HISTORICAL RESOURCES

Mr. Michael A. Blaylock
Department of the Air Force
45 CES/CEAN
1224 Jupiter Street, MS 9125
Patrick Air Force Base, Florida 32925-3343

February 28, 2012

RE: DHR Project File Number: 2012-665
Demolition of Three Administrative Buildings - Facilities 557, 559, and 560
Patrick Air Force Base, Brevard County

Dear Mr. Blaylock:

This office reviewed the referenced projects for possible impact to historic properties listed, or eligible for listing, on the *National Register of Historic Places*. The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended and *36 CFR Part 800: Protection of Historic Properties*.

In November 2011 we concurred with the Department of Air Force (USAF) that Facility 557 (8BR1837), 559 (8BR2064), and 560 (8BR2065), were contributing resources to the *Patrick Air Force Base Administrative Historic District* (8BR2440), which appears to meet the criteria for listing on the *National Register*.

The demolition of the facilities will constitute an adverse effect. Since the State Historic Preservation Office (SHPO) and the USAF have determined that the demolition will constitute an adverse effect the following procedures relating to 36 CFR Part 800.6 Resolution of Adverse Effects must be implemented by the USAF.

1) Per 36 CFR § 800.6(a), the Agency (USAF) shall continue consultation with the SHPO and other consulting parties to develop and evaluate alternatives or modifications to the undertakings that could avoid, minimize or mitigate adverse effects on historic properties. The Agency shall submit a *case study** outlining these efforts for review by the SHPO.

** A case study is a document that outlines a federal agency's efforts to develop and evaluate alternatives or modifications to a project that could avoid or minimize adverse effects to cultural resources. The case study provides a record of an agency's due diligence to carefully consider the impacts of its actions upon cultural resources. The document may also reveal previously unidentified but feasible alternatives that will avoid impacts altogether.*

(2) In accordance with 36 CFR § 800.6(a)(4), the Agency shall make information regarding this finding available to the public, providing the public with an opportunity to express their views on resolving adverse effects of the undertakings. Pursuant to 36 CFR § 800.11(e), copies or summaries of any views provided by consulting parties and the public shall be made available to the SHPO as part of the case study outlined in (1).



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Mr. Blaylock
DHR No. 2012-665
February 28, 2012
Page 2 of 2

(3) The Agency shall immediately notify the Advisory Council on Historic Preservation (ACHP), Old Post Office Building, 1100 Pennsylvania Avenue, NW, Suite 809, Washington, D.C. 20004, of the adverse effect finding per 36 CFR § 800.6 (a)(1). The notification to the ACHP should be similar to the project information submitted to this office and should include the following documentation as outlined in 36 CFR § 800.11(e).

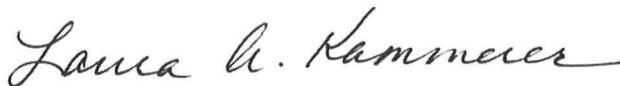
(4) The Agency shall invite the ACHP to participate in consultation if the undertaking will affect a National Historic Landmark, if a Programmatic Agreement will be developed as a result of the finding of adverse effect, or if the Agency wants the ACHP to participate in consultation. The ACHP will advise of its decision to participate in consultation within fifteen (15) days of receipt of this notification or other request. If the ACHP chooses not to participate in consultation, the Agency shall resolve the adverse effect without ACHP participation and pursuant to 36 CFR § 800.6(b)(1).

(5) If the Agency, the SHPO and, if applicable, the ACHP agree on how the adverse effects will be resolved, they shall execute a Memorandum of Agreement (MOA) pursuant to 36 CFR § 800.6(c).

(6) If the Agency and the SHPO fail to agree on the terms of the MOA, the Agency shall request the ACHP to join the consultation. If the ACHP decides to join the consultation, the Agency shall proceed in accordance with 36 CFR § 800.6(b)(2). If the ACHP decides not to join the consultation, the ACHP will notify the Agency and proceed to comment in accordance with 36 CFR § 800.7.

If you have any questions concerning our comments, please contact Scott Edwards, Historic Preservationist, by electronic mail scott.edwards@dos.myflorida.com, or at 850.245.6333 or 800.847.7278.

Sincerely,



Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

PC: Katry Harris, ACHP

APPENDIX D
CONSULTATION WITH
FLORIDA STATE CLEARINGHOUSE



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

June 20, 2012

Ms. Keitha Dattilo-Bain
Department of the Air Force
45 CES/CEAO
1224 Jupiter Street, MS 9125
Patrick AFB, FL 32925-3343

RE: Department of the Air Force – Final Draft Environmental Assessment for
Implementation of the General Management Plan and Maintenance at
Patrick Air Force Base – Brevard County, Florida.
SAI # FL201205156228C

Dear Ms. Dattilo-Bain:

The Florida State Clearinghouse has coordinated a review of the referenced Final Draft Environmental Assessment (EA) under the following authorities: Presidential Executive Order 12372; § 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection's (DEP) Central District Office in Orlando advises that the proposed construction projects located east of the coastal construction control line, which follows U.S. Highway A1A in this area, may require an Environmental Resource Permit (ERP) with appropriate stormwater treatment and attenuation. Any future improvements to the marina would also be processed through the DEP Central District Office. Proposed projects on the base located west of U.S. A1A would require the applicant to obtain an ERP from the St. Johns River Water Management District. For additional information and assistance, please contact Ms. Debra Laisure, P.E., Stormwater Engineer, at (407) 897-2952 or Ms. Kimberly Eisele, Environmental Specialist, at (407) 897-2950.

According to the Final Draft EA, Potable Water Permits will be obtained for all construction activities that meet development thresholds. The DEP notes that modifications and or construction of drinking water infrastructure, including water mains supplying new construction on the base, may require public water system permits under Chapter 62-555, *Florida Administrative Code*. If sufficient water mains are already in place, individual

Ms. Keitha Dattilo-Bain
June 20, 2012
Page 2 of 3

service lines supplying a single building are exempted from permitting. Please contact Mr. Reggie Phillips, Environmental Specialist, at (407) 897-4132 for further assistance.

Staff from DEP Air Resources Management Program also states that the proposed demolition and renovation projects would be subject to 40 C.F.R. 61, Subpart M, the National Emission Standards for Asbestos. The DEP notes that various air concerns relating to proposed demolition and construction activities, addressed on pages 4-1 through 4-8, may affect the Title V air quality permit. The insignificant emission units should be reviewed and addressed in detail within the most current permit. For additional information, please contact Mr. Jeff Rustin, P.E., Permitting Engineer, at (407) 897-2930 or Ms. Wanda Parker-Garvin, Environmental Manager, at (407) 897-2934.

The Florida Fish and Wildlife Conservation Commission (FWC) offers the following comments and recommendations on the Final Draft EA:

- Although a number of state-listed species have been observed and are known to occur within Patrick Air Force Base, the Final Draft EA does not indicate when the reported wildlife observations were made. To better identify the potential impacts to wildlife resources, FWC staff recommends that wildlife surveys be conducted prior to project activities or development. Wildlife surveys should follow the established survey protocols approved by the U.S. Fish and Wildlife Service and FWC.
- Since flat gravel roof buildings are proposed to be re-roofed with new materials not suitable for seabird nesting, staff requests that the FWC be contacted if black skimmer and least tern nests are identified near the project area to discuss any avoidance, minimization, mitigation and/or permitting requirements.
- The gopher tortoise burrows observed on a landfill proposed for reutilization should be avoided and flagged with buffers during construction. In accordance with the FWC's *Gopher Tortoise Permitting Guidelines* (Revised November 2011), an FWC gopher tortoise relocation permit is not required if a 25-foot buffer is extended from the mouth of all burrows.
- As Florida manatees have been observed adjacent to the western shoreline in the Banana River, staff also recommends that the *Standard Manatee Construction Conditions for In-Water Work* be followed for all in-water activities (please see http://www.saj.usace.army.mil/Divisions/Regulatory/DOCS/endangered/2011_StandardConditionsForIn-waterWork.pdf). To prevent manatee entrapment and drowning, grating should be installed and maintained on all existing and proposed stormwater pipes between 8 inches and 8 feet in diameter (please also see http://myfwc.com/media/415238/manatee_grates.pdf).

Please refer to the enclosed FWC letter and contact Mr. Ben Shepherd at (407) 858-6170 or Ben.Shepherd@MyFWC.com for further information and assistance.

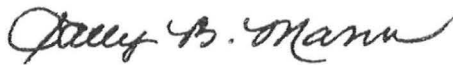
Ms. Keitha Dattilo-Bain
June 20, 2012
Page 3 of 3

The Florida Department of Transportation's (FDOT) District Five staff notes that any onsite or offsite improvements associated with this project that impact FDOT facilities will require the appropriate FDOT permits. Required permits may include access management, utility, drainage or other permits depending on the work planned. The applicant is advised to contact Mr. Jack West in the District's local maintenance office at (321) 690-3242 for more detailed review once plans are available.

Based on the information contained in the Final Draft EA and the enclosed state agency comments, the state has determined that, at this stage, the proposed federal activities are consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the concerns identified by our reviewing agencies must be addressed prior to project implementation. The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and subsequent reviews. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428, *Florida Statutes*.

Thank you for the opportunity to review this proposal. Should you have any questions regarding this letter, please contact Ms. Suzanne E. Ray at (850) 245-2172.

Yours sincerely,



Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/ser
Enclosures

cc: Lu Burson, DEP Central District
Roxane Dow, DEP BBBS
Scott Sanders, FWC
Martin Markovich, FDOT



Florida

Department of Environmental Protection

"More Protection, Less Process"



Categories

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Project Information	
Project:	FL201205156228C
Comments Due:	06/18/2012
Letter Due:	06/26/2012
Description:	DEPARTMENT OF THE AIR FORCE - FINAL DRAFT ENVIRONMENTAL ASSESSMENT FOR IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN AND MAINTENANCE AT PATRICK AIR FORCE BASE - BREVARD COUNTY, FLORIDA.
Keywords:	USAF - DEA, GENERAL MANAGEMENT PLAN AND MAINTENANCE AT PATRICK AFB - BREVARD CO.
CFDA #:	12.200
Agency Comments:	
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION	
<p>The DEP Central District Office in Orlando advises that the proposed construction projects located east of the CCCL, which follows U.S. A1A in this area, may require an ERP with appropriate stormwater treatment and attenuation. Any future improvements to the marina would also be processed through the DEP Central District Office. Proposed projects on the base located west of U.S. A1A would require the applicant to obtain an ERP from the SJRWMD. According to the Final Draft EA, Potable Water Permits will be obtained for all construction activities that meet development thresholds. The DEP notes that modifications and or construction of drinking water infrastructure, including water mains supplying new construction on the base, may require public water system permits under Chapter 62-555, F.A.C. If sufficient water mains are already in place, individual service lines supplying a single building are exempted from permitting. Staff from DEP Air Resources Management Program also advises that the proposed demolition and renovation projects would be subject to 40 C.F.R. 61, Subpart M, the National Emission Standards for Asbestos. The DEP notes that various air concerns relating to proposed demolition and construction activities, addressed on pages 4-1 through 4-8, may affect the Title V air quality permit. The insignificant emission units should be reviewed and addressed in detail within the most current permit.</p>	
STATE - FLORIDA DEPARTMENT OF STATE	
No Comment/Consistent	
ST. JOHNS RIVER WMD - ST. JOHNS RIVER WATER MANAGEMENT DISTRICT	
<p>SJRWMD does not have any comments. If permitting-related questions arise, the applicant may contact SJRWMD Supervising Regulatory Scientist, Ms. Susan Moor, at (321)676-6626 or smoor@sjrwmd.com.</p>	
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION	
<p>The FWC notes that a number of state-listed species have been observed and are known to occur within Patrick AFB, but the Final Draft EA does not indicate when the reported wildlife observations were made. To better identify the potential impacts to wildlife resources, FWC staff recommends that wildlife surveys be conducted prior to project activities or development. Wildlife surveys should follow the established survey protocols approved by the U.S. Fish and Wildlife Service and FWC. Since flat gravel roof buildings are proposed to be re-roofed with new materials not suitable for seabird nesting, staff requests that the FWC be contacted if black skimmer and least tern nests are identified near the project area to discuss any avoidance, minimization, mitigation and/or permitting requirements. Similarly, the gopher tortoise burrows observed on a landfill proposed for reutilization should be avoided and flagged with buffers during construction. In accordance with the FWC's Gopher Tortoise Permitting Guidelines (Revised November 2011), an FWC gopher tortoise relocation permit is not required if a 25-ft. buffer is extended from the mouth of all burrows. As Florida manatees have been observed adjacent to the western shoreline in the Banana River, staff also recommends that the Standard Manatee Construction Conditions for In-Water Work (2011) be followed for all in-water activities. To prevent manatee entrapment and drowning, grating should be installed and maintained on all existing and proposed stormwater pipes between 8 in. and 8 ft. in diameter.</p>	
TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION	
<p>The FDOT's District Five staff appreciates the opportunity to provide comments and notes that any onsite or offsite improvements associated with this project that impact FDOT facilities will require the appropriate permits. Required permits may include access management, utility, drainage or other permits depending on the work planned. The applicant is advised to contact Mr. Jack West in the District's local maintenance office at (321) 690-3242 for more detailed review once plans are available. The FDOT Aviation Office has no further comments.</p>	
E. CENTRAL FL RPC - EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL	
<p>The East Central Florida Regional Planning Council has not identified any significant or adverse effects to regional resources or facilities, nor have any extra-jurisdictional impacts been identified that would adversely affect neighboring jurisdictions. Multiple biodiversity hot spots appear to be near the project site as represented in the Natural Resources of Regional Significance (NRORS) datasets identified in the ECFRPC's Strategic Regional Policy Plan (ECF 2060 Plan). It is recommended that the proper environmental impact studies and wildlife mitigation plans be implemented prior to project construction. The proposed project is found to be consistent with the goals, policies, and objectives of the ECFRPC.</p>	



June 15, 2012

Florida Fish and Wildlife Conservation Commission

Commissioners

Kathy Barco
Chairman
Jacksonville

Kenneth W. Wright
Vice Chairman
Winter Park

Ronald M. Bergeron
Fort Lauderdale

Richard A. Corbett
Tampa

Aliese P. "Liesa" Priddy
Immokalee

Charles W. Roberts III
Tallahassee

Brian S. Yablonski
Tallahassee

Executive Staff

Nick Wiley
Executive Director

Greg Holder
Assistant Executive Director

Karen Ventimiglia
Chief of Staff

Office of the
Executive Director

Nick Wiley
Executive Director

(850) 487-3796
(850) 921-5786 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

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Tallahassee, Florida
32399-1600
Voice: (850) 488-4676

Hearing/speech-impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)

MyFWC.com

Ms. Lauren P. Milligan
Department of Environmental Protection
Florida State Clearinghouse
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000
Lauren.Milligan@dep.state.fl.us

RE: FL201205156228C, Florida Department of Environmental Protection; Department of the Air Force --Final Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for Implementation of the General Management Plan and Maintenance at Patrick Air Force Base, Brevard County

Dear Ms. Milligan:

Florida Fish and Wildlife Conservation Commission (FWC) staff has reviewed the Final Draft EA and FONSI for Patrick Air Force Base and provides for your consideration comments pursuant to the National Environmental Policy Act and the Coastal Zone Management Act/Florida Coastal Management Program.

Proposed Action

The 45th Space Wing of the U.S. Air Force has submitted a Final Draft EA of the Patrick Air Force Base (PAFB) General Plan, which serves as the comprehensive planning document for PAFB. As part of the PAFB General Plan, PAFB proposes to construct new or renovate existing facilities, expand and construct facilities, complete stormwater design, conduct marina and canal dredging, and conduct general maintenance over the next five years. In-water work would include the elimination of sixteen slips in the existing marina to accommodate larger vessels; docks D, E, and F as well as the existing finger piers are to be renovated.

PAFB is a 2,000-acre military base located on a barrier island between the Banana River and Atlantic Ocean in Brevard County. The Banana River is part of the Indian River Lagoon complex, a 156-mile-long estuary that extends from Ponce de Leon inlet to Jupiter inlet. Land cover on the base is predominantly high-intensity urban (1,527 acres) and low-intensity urban (197 acres) uses. On-base habitats include upland hardwood forests (27 acres), shrub and brushland (18 acres), rivers (41 acres), estuarine (31 acres), and sand beach (54 acres).

Potentially Affected Resources

FWC staff performed a Geographic Information System (GIS) analysis of the project and adjacent areas. Results of our GIS analysis indicate that the project lies within, supports, or is adjacent to:

- Wildlife observations of the black skimmer [*Rynchops niger*, State Species of Special Concern (SSC)] and least tern [*Sterna antillarum*, State Threatened (ST)]

- Rare fish drainages for the Atlantic sturgeon (*Acipenser oxyrinchus*, SSC)
- Potential habitat for the gopher tortoise (*Gopherus polyphemus*, ST) and commensal species, such as the gopher frog (*Lithobates capito*, SSC), Florida pine snake (*Pituophis melanoleucus mugitus*, SSC), and Florida mouse (*Podomys floridanus*, SSC)
- Habitat for the Florida manatee (*Trichechus manatus latirostris*, Federally Endangered)
- Cocoa Beach Canals, the East Banana River, and South Banana River, which are designated as Important Manatee Areas under The Corps of Engineers, Jacksonville District, and the State of Florida Determination Key for the Manatee in Florida (dated October 2008; see http://www.dep.state.fl.us/water/wetlands/forms/spgp/SPGP_IV_Attachment_2-ManateeKey.pdf)

As stated in the Final Draft EA, state-listed species observed in the proposed action areas include the little blue heron (*Egretta caerulea*, SSC), reddish egret (*Egretta rufescens*, SSC), snowy egret (*Egretta thula*, SSC), tricolored heron (*Egretta tricolor*, SSC), white ibis (*Eudocimus albus*, SSC), American oystercatcher (*Haematopus palliatus*, SSC), and gopher tortoise.

Comments and Recommendations

Listed species are known to occur within PAFB but the Final Draft EA does not indicate when those wildlife observations were made. Wildlife resources tend to be dynamic and can change over time. To better identify the potential impacts to wildlife resources, we recommend conducting wildlife surveys prior to project activities or development. These wildlife surveys should follow established survey protocols approved by the U.S. Fish and Wildlife Service and the FWC. Basic guidance for conducting wildlife surveys may be found in the Florida Wildlife Conservation Guide (<http://myfwc.com/conservation/value/fwcg/>).

The Final Draft EA states that least terns and black skimmers have periodically nested on two to four flat gravel roofs in the PAFB North Base Administrative area, and that buildings will be re-roofed with new materials not suitable for seabird nesting. To prevent direct impacts to least terns and black skimmers, PAFB intends to replace rooftops outside the nesting season (April through August) of skimmers and least terns. If nests are identified near the project area, we recommend contacting the FWC to discuss avoidance, minimization, mitigation, and/or permitting requirements. Active nests are protected under state rule and the Migratory Bird Treaty Act. For more information about these species, contact Alex Kropp at the FWC's Ocala Regional Office at (352) 732-1225.

Similarly, the Final Draft EA states that gopher tortoise burrows observed on a landfill proposed for reutilization are to be avoided and flagged with buffers during construction. As described in the Gopher Tortoise Permitting Guidelines (Revised November 2011; see <http://myfwc.com/license/wildlife/gopher-tortoise-permits/>), an FWC gopher tortoise relocation permit is not required if a 25-foot buffer is extended from the mouth of all

burrows. Project activities within 25 feet of a gopher tortoise burrow would require an FWC gopher tortoise relocation permit.

As Florida manatees have been observed adjacent to PAFB's western shoreline in the Banana River, we recommend that the Standard Manatee Construction Conditions for In-Water Work (2011; see http://www.saj.usace.army.mil/Divisions/Regulatory/DOCS/endangered/2011_StandardConditionsForIn-waterWork.pdf) should be followed for all in-water activity. Stormwater management projects are proposed in the Final Draft EA, although it is unclear whether existing or proposed grates or culverts are submerged or partially submerged and accessible to manatees. To reduce the risk of entrapment and drowning of manatees, we recommend that grating be installed and maintained over any existing or proposed pipes or culverts greater than 8 inches, but smaller than eight feet in diameter, that are submerged or partially submerged and accessible to manatees. Future permit conditions should stipulate that bars or grates no more than eight inches apart be placed on the accessible end(s) during all phases of the construction process and as a final design element to restrict manatee access. Additional information on exclusion devices for culverts and pipes can be found at http://myfwc.com/media/415238/manatee_grates.pdf.

The FWC concurs that the proposed general management plan and maintenance at Patrick Air Force Base is consistent with our authorities under the Coastal Zone Management Act, Florida's Coastal Zone Management Program. We may have additional input regarding appropriate conservation measures as proposed projects move forward and/or when wildlife surveys are completed. If you need any further assistance, please do not hesitate to contact Jane Chabre either by phone (850) 410-5367 or at FWCConservationPlanningServices@MyFWC.com.

If you have specific technical questions regarding the content of this letter, please contact Ben Shepherd at (407) 858-6170 or by email at Ben.Shepherd@MyFWC.com.

Sincerely,



Scott Sanders, Director
Office of Conservation Planning Services

ss/bg/bs

ENV 1-3-2

Patrick AFB – General Management Plan_16298_061512

cc: Keitha Dattilo-Bain
Asset Optimization
Department of the Air Force, 45th Space Wing (AFSPC)
1224 Jupiter Street, MS 9125
Patrick Air Force Base, FL 32925-3343
Keitha.dattilobain@us.af.mil

David L. Hankla, USFWS, dave_hankla@fws.gov
John Milio, USFWS, john_milio@fws.gov

COUNTY: BREVARD
SCH - USAF - PK
2012-2387

DATE: 5/11/2012
COMMENTS DUE DATE: 6/18/2012
CLEARANCE DUE DATE: 6/26/2012
SAI#: FL201205156228C

MESSAGE:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
ENVIRONMENTAL PROTECTION	ST. JOHNS RIVER WMD		
FISH and WILDLIFE COMMISSION			
X STATE			
TRANSPORTATION			

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

DEPARTMENT OF THE AIR FORCE - FINAL DRAFT ENVIRONMENTAL ASSESSMENT FOR IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN AND MAINTENANCE AT PATRICK AIR FORCE BASE - BREVARD COUNTY, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA Federal Consistency

- No Comment
- Comment Attached
- Not Applicable
- No Comment/Consistent
- Consistent/Comments Attached
- Inconsistent/Comments Attached
- Not Applicable

From:

Division of Historical Resources
Bureau of Historic Preservation

Reviewer: S. Edwards

Laura L. Kammerer
Deputy SHPO
6-11-2012

Date: 6-11-2012

RECEIVED

JUN 12 2012

DEP Office of Intergov't Programs

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BUREAU OF HISTORIC PRESERVATION
MAY 18 P 2:14

APPENDIX E
45th SPACE WING INSTALLATION RESTORATION
PROGRAM SOLID WASTE MANAGEMENT
UNIT FACT SHEETS



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: FORMER TRANSFORMER IN SOUTHERN COURTYARD AT
FACILITY 989, SWMU NO. 161
INSTALLATION RESTORATION PROGRAM- SITE SA035
PATRICK AIR FORCE BASE, FLORIDA

Current Status: SITE INVESTIGATION IDENTIFIED SOIL CONTAMINATION;
SOIL REMEDIATION PLANNED IN 2009

Site History: Solid Waste Management Unit (SWMU) No. 161, the site of a former transformer is located in the southern courtyard at Facility 989 (see site map, below), near the intersection of South Tech Road and West Tech Road on Patrick Air Force Base (PAFB). The former facility consisted of two groups of three transformers. Each group consisted of 333 kilo-volt amps (KVA). Transformers convert the electric power supplied by the PAFB utility network to the power level (voltage) required by the facility or facilities that the transformer services. Electrical equipment was present at this location from approximately 1966 to 1983.

This SWMU was originally identified during the installation-wide Polychlorinated Biphenyl (PCB) Transformer Preliminary Assessment (PA), which was undertaken to evaluate areas where electrical equipment that historically contained PCB dielectric fluid may have released PCBs to the environment. Leaks or spills of PCB-containing dielectric fluid have the potential to adversely impact the surrounding environmental media. This former transformer site was identified by the PA as a potential release location based on operations during the time period when PCBs were a common component of dielectric fluid. During the 1990s, the USAF conducted a comprehensive program at PAFB to replace PCB-containing dielectric fluid.

Environmental Media and Contaminants:

Groundwater: PCB concentrations in the soil exceed the concentration that indicates a potential for contaminants to leach from soil into groundwater. Therefore, groundwater assessment will be conducted in 2009

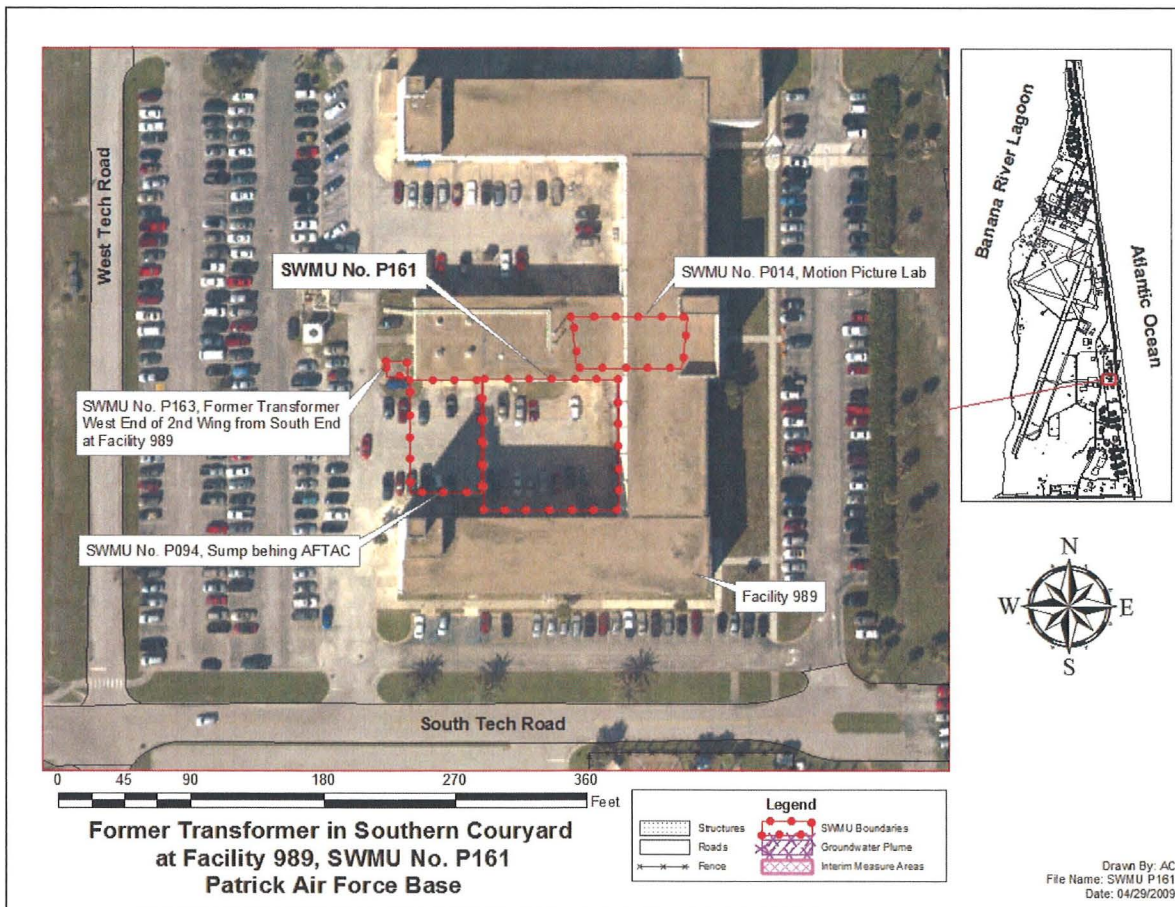
Soil: PCBs have been detected in the soil and surrounding asphalt at concentrations that exceed both the residential and industrial cleanup criteria. Delineation has been completed and soil and asphalt remediation is planned in 2009 or 2010.

Surface Water/Sediment: No surface water bodies are located on or near the site.

Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a Preliminary Assessment (PA) of this site was completed in 2008. This study recommended the former site for further assessment under the PAFB Electrical Equipment Confirmation Sampling (CS) and limited Site Investigation (SI) project. The CS/SI project identified PCB impacted soils at concentrations greater than FDEP's residential and industrial SCTLs.

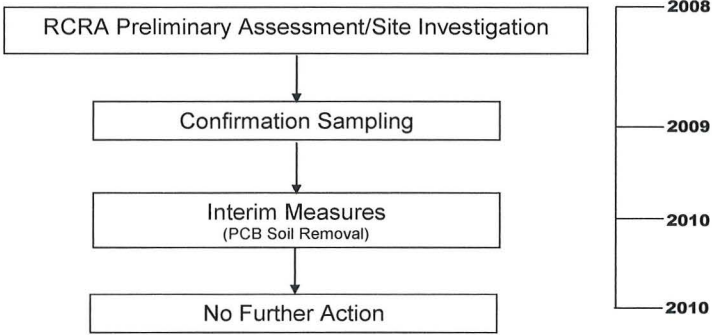
Recommendations for the site include soil and asphalt remediation. Groundwater sampling is also planned due to the concentrations of PCB impacted soil above leachability values.

Future Actions: Soil and asphalt remediation is planned as an interim measure (IM) in 2009 or 2010. If residential cleanup standards are applied, the site may be eligible for no further action. If the soils are only remediated to industrial cleanup criteria and/or groundwater contamination is identified, additional remedial measures and controls may be needed. If such measures are warranted, a Statement of Basis will be issued to document long term remedial requirements.



IRP Process Flow Chart

SWMU No. P161 (Former Transformer)



Current site conditions at the location of the former transformer.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: PLATING SHOP, BUILDINGS 313/533, SWMU NO. 041
INSTALLATION RESTORATION PROGRAM- SITE OT030
PATRICK AIR FORCE BASE, FLORIDA

Current Status: PERFORMANCE MONITORING ON GROUNDWATER CORRECTIVE MEASURE AND LONG TERM MONITORING ON GROUNDWATER PLUME ON-GOING; LAND USE CONTROLS BEING MAINTAINED.

Site History: Solid Waste Management Unit (SWMU) No. 041 is located in the industrial area (see site map, below) of Patrick Air Force Base (PAFB). The investigation began at Building 313 and, in the process of following the groundwater plume upgradient, high levels of contamination in the vicinity of Building 533 were discovered. In reality, each facility represents a separate source of contamination, but since the plumes are co-mingled and the sources are reasonably close to one another, the investigation was expanded to include both areas. Building 313 is currently used as a maintenance hangar and Building 533 is a communications building. Metal plating operations were performed at several locations in Building 313 between the mid-1940's and 1983, resulting in industrial solvents and metal contamination. Building 533 was constructed in 1959 and housed the base communications operations including a teletype maintenance shop, radio maintenance shop, and telephone outside plant shop. All three of these shops reportedly used solvents in day-to-day operations. Additionally, historical blueprints indicate that several laboratories were formally located on the Building 533 site.

Environmental Media and Contaminants:

Groundwater: Known contaminants include residual industrial solvents and metals. Concentrations of the contaminants are above appropriate screening values.

Surface Water: No known contaminants have been identified in surface water.

Sediment: No known contaminants have been identified in sediment.

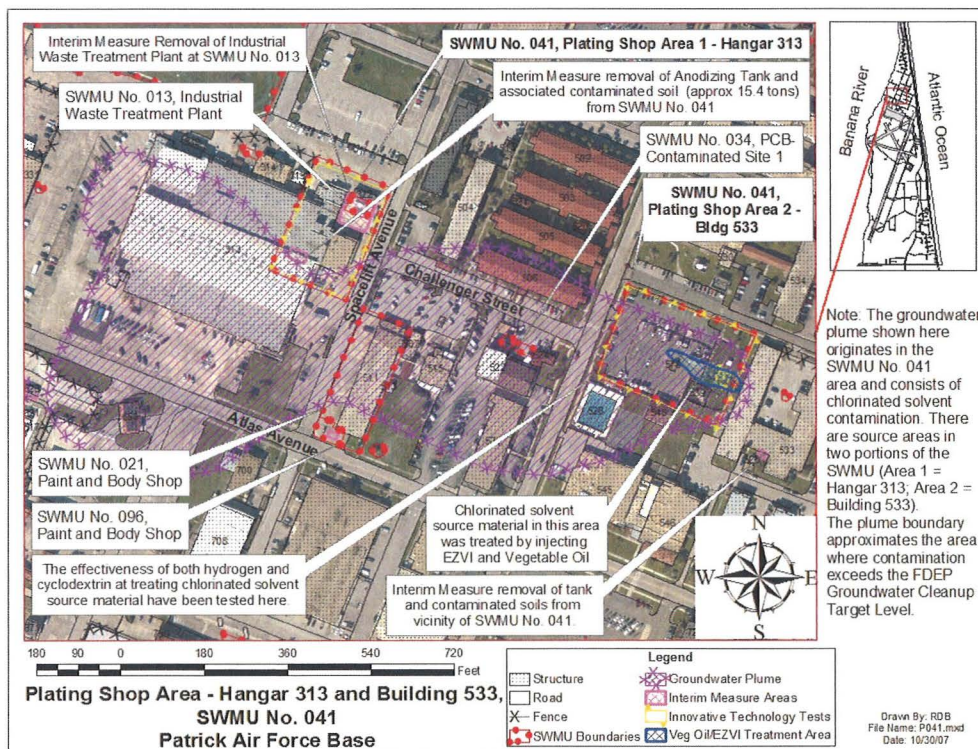
Soil: Several metals in subsurface soil samples were found to exceed residential cleanup standards and/or leachability standards. Land use controls have been implemented to ensure that the residual soil contamination does not adversely impact human health or the environment.

Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a Site Investigation (SI) was completed in 1994. Based on SI results, a RCRA Facility Investigation (RFI) was conducted to fully evaluate the nature and extent of contamination at the site and to assess the human health and ecological risk posed by site contaminants. The RFI was completed in 1998 and recommended that a Corrective Measures Study (CMS) be completed to determine the most appropriate remedy for groundwater contamination at the site. Studies have indicated that Dense Non-Aqueous Phase Liquids (DNAPLs) are present in the subsurface. The DNAPLs are believed to result from industrial solvent use and are a continuing source of groundwater contamination. The CMS was completed in 2002 and recommended bioremediation to promote degradation of the solvents in the subsurface. Field technology tests were conducted on cyclodextrin injection. The technology results were inconclusive. Based on the potential for contaminant mobilization that could be caused by cyclodextrin, injection of vegetable oil and emulsified zero valent iron (EZVI) was selected as the remedy. The Corrective Measures Design (CMD) was finalized in April 2004 and a Statement of Basis was drafted.

Source area groundwater treatment was completed over several events between 2005 and 2008. EZVI (60,100 gallons), vegetable oil (49,600 gallons), and KB-1 (683 liters) were injected into the groundwater treatment area. EZVI is a non-hazardous, non-toxic oil-in-water emulsion that delivers iron particles into contact with the chlorinated solvent residuals, whereupon instantaneous dechlorination occurs and the contaminants are reduced to harmless ethene. KB-1 is a patented line of bacterium with a demonstrated potential to dechlorinate trichloroethene and its daughter products. Vegetable oil provides a carbon source for microbial growth.

Performance monitoring has been on-going since the initial injections were completed in 2005. Long Term Monitoring (LTM) has also been initiated on the groundwater plume as a whole, to track the continued natural decline of residual contaminants.

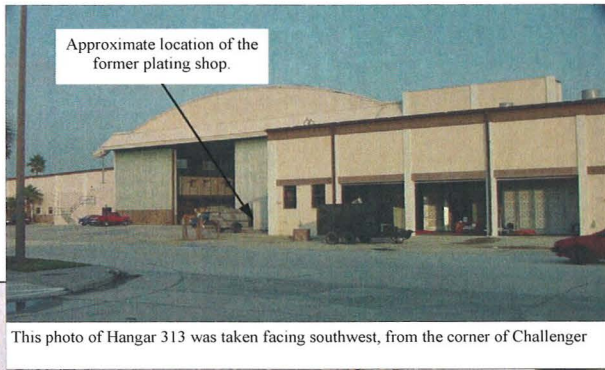
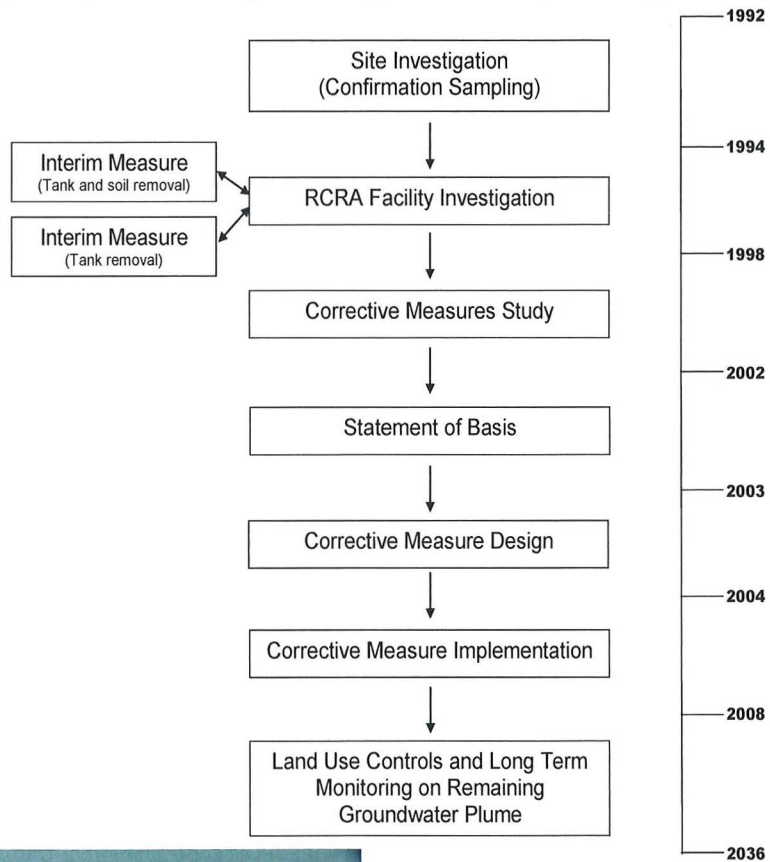
Future Actions: Groundwater LTM will continue until all residual contaminant concentrations are below cleanup criteria. Land use controls will be maintained on both soil and groundwater to ensure that contaminant residuals do not cause any adverse impacts to human health or the environment.



For further information regarding this site, please contact the 45th SW IRP Office at 853-0965

IRP Process Flow Chart

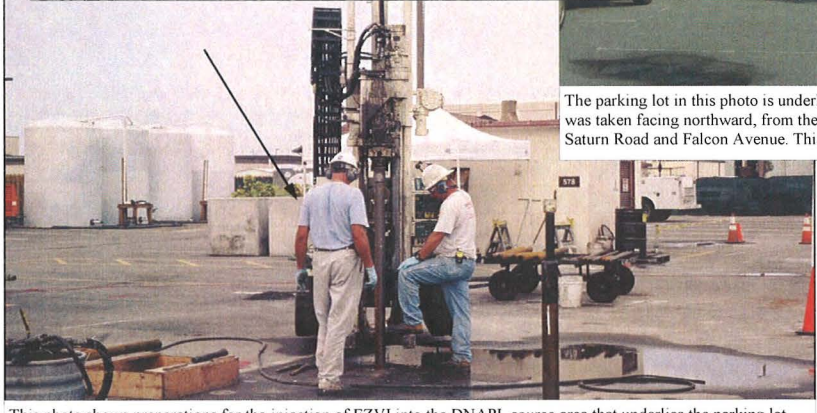
SWMU No. 041 (Buildings 313/533, Plating Shop)



This photo of Hangar 313 was taken facing southwest, from the corner of Challenger



The parking lot in this photo is underlain by the plume from SWMU No. 041. This photo was taken facing northward, from the south side of the parking lot located at the corner of Saturn Road and Falcon Avenue. This parking lot is located west of Building 533



This photo shows preparations for the injection of EZVI into the DNAPL source area that underlies the parking lot west of Building 533. Photo was taken from northeast corner of parking lot, looking southwest.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: PAVING AND GROUNDS FACILITY, BUILDING 958, SWMU NO. 045
INSTALLATION RESTORATION PROGRAM- SITE DP031
PATRICK AIR FORCE BASE, FLORIDA

Current Status: GROUNDWATER LONG TERM MONITORING WITH LAND USE CONTROLS

Site History: Solid Waste Management Unit (SWMU) No. 045, Building 958 was built in 1945 to support the Patrick Air Force Base (PAFB) pest management program (See site map, below). Building 958 has also served as an engine maintenance shop. Over its history, pesticides, herbicides, and petroleum products and wastes were handled and stored at the site. Building 958 was demolished in 1999 as part of the Interim Measure (IM) soil removal.

Environmental Media and Contaminants:

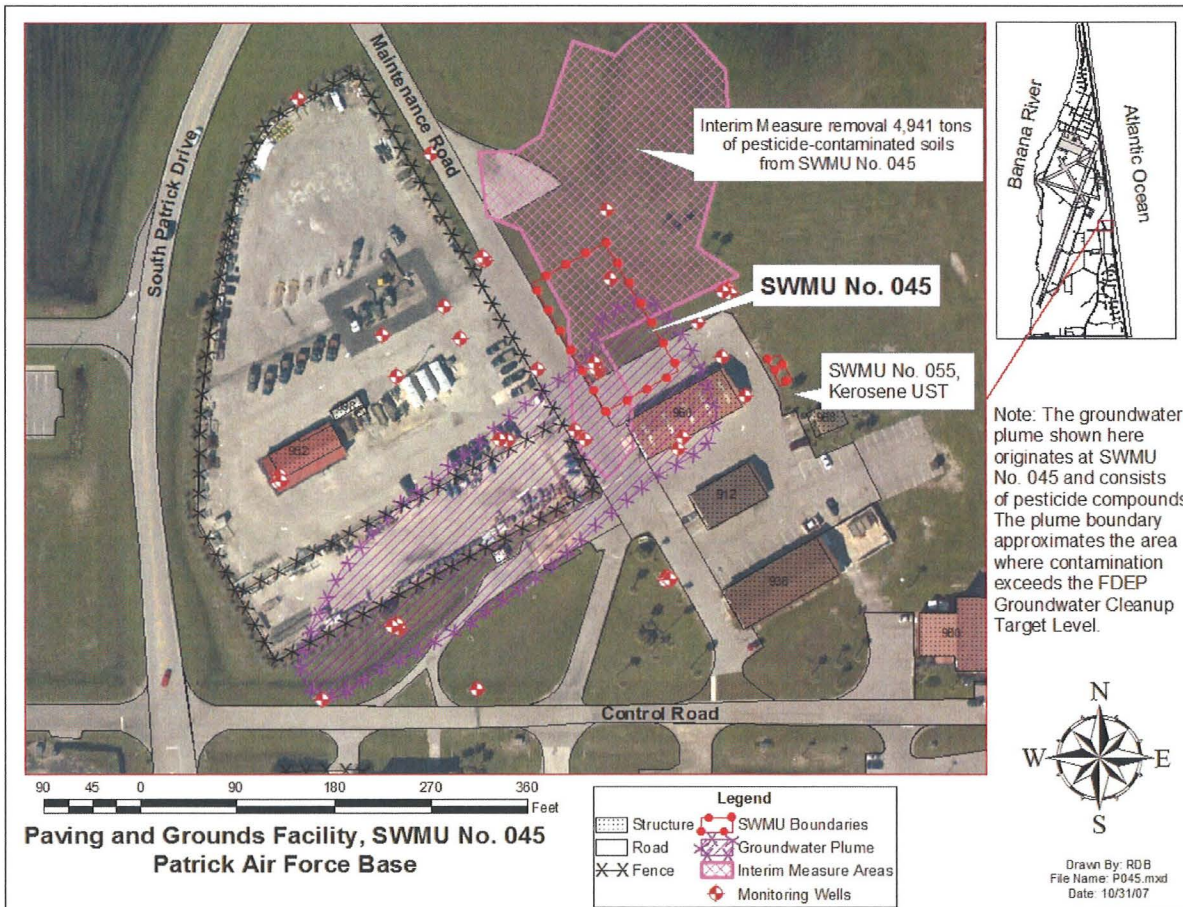
Groundwater: Constituents detected in site groundwater above appropriate screening criteria include petroleum products, metals and pesticides. Long Term Monitoring (LTM) of groundwater has been instituted to ensure that groundwater contaminant levels decline.

Soil: Constituents detected in site soils above appropriate screening criteria include metals, pesticides and other industrial waste products. An Interim Measure (IM) was conducted in order to remove contaminated soils from the site. Remaining soils meet Florida Department of Environmental Protection residential standards.

Surface Water/Sediment: No surface water bodies are located on or near the site.

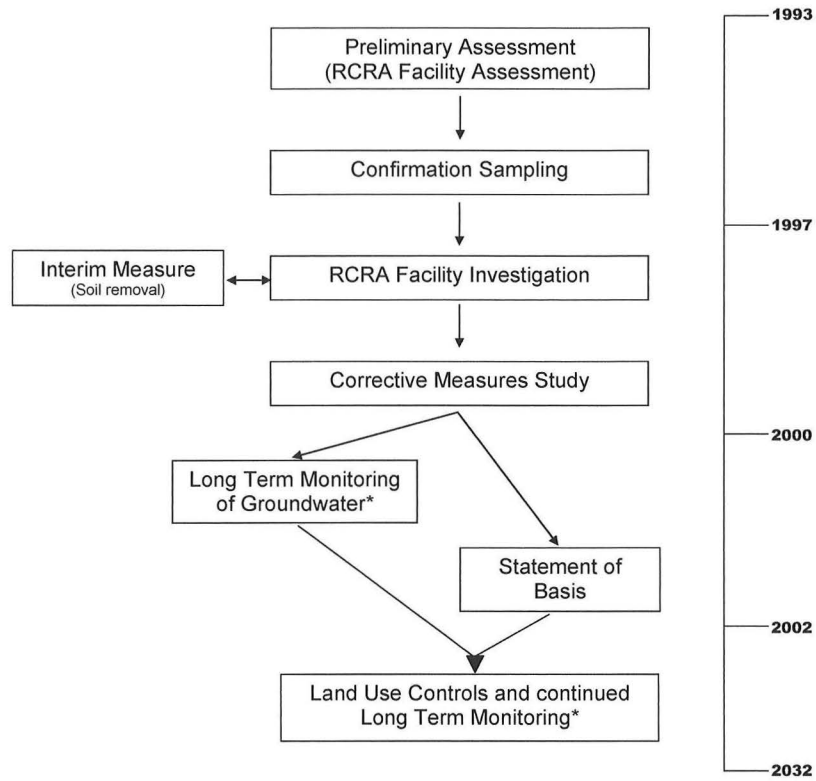
Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a Preliminary Assessment (PA) was conducted in 1993. Results of the PA recommended a Confirmatory Sampling (CS) event. Based on the CS findings, a RCRA Facility Investigation (RFI) Work Plan was submitted in September 1997. The RFI was designed to determine the nature and extent of the site contamination and to assess the risk posed to human health and the environment. Concurrent with the RFI, an IM was conducted to excavate and remove contaminated soils. The RFI concluded that remaining soils do not pose a risk to human health or the environment, but that groundwater contaminant concentrations dictated further action. A Corrective Measures Study (CMS) was then completed to select the best possible groundwater remedy. The final CMS recommended Long Term Monitoring (LTM) of groundwater with Land Use Controls (LUCs). The Statement of Basis (SB) for Building 958 has been finalized and the LUCs are documented in the Land Use Controls Implementation Plan that accompanies the SB. LTM was initiated in 2001 and the site is routinely monitored under the LUC program.

Future Actions: LTM is currently on-going and will be continued until contaminant concentrations are consistently below screening values. LUCs have been implemented to ensure that groundwater use is restricted.



IRP Process Flow Chart

SWMU No. 045 (Building 958, Paving and Grounds Shop, PAFB)



*Long Term Monitoring of groundwater was implemented immediately following the Corrective Measures Study (CMS), based on the recommendations in the CMS. This monitoring is included in the Statement of Basis as part of the "final remedy" for the Site. LTM will be carried out until all contaminant levels are below the relevant screening criteria for 2 consecutive rounds of sampling.



The grassy area in this photo is the former location of the Paving and Grounds Facility. As part of the IM the building was demolished. This photo was taken from near the corner of South Patrick Drive and Maintenance Road facing south toward Building 960.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: LANDFILL NO. 5, SWMU NO. 026
INSTALLATION RESTORATION PROGRAM- SITE LF027
PATRICK AIR FORCE BASE, FLORIDA

Current Status: MAINTENANCE OF LAND USE CONTROLS WITH VOLUNTARY LONG TERM MONITORING

Site History: Solid Waste Management Unit (SWMU) No 026, Landfill No. 5, was used between 1962 through 1972 for the disposal of general base refuse including office, cafeteria, and industrial materials. The site is located on the west side (see site map, below) of Patrick Air Force Base (PAFB) between the Survival Canal and the Banana River Lagoon. This site is currently undeveloped.

Environmental Media and Contaminants:

Groundwater: Metals were detected in groundwater at concentrations that exceeded screening values. A groundwater Long Term Monitoring (LTM) program was initiated. Termination of LTM was approved in 1997 when all contaminants were consistently below screening values.

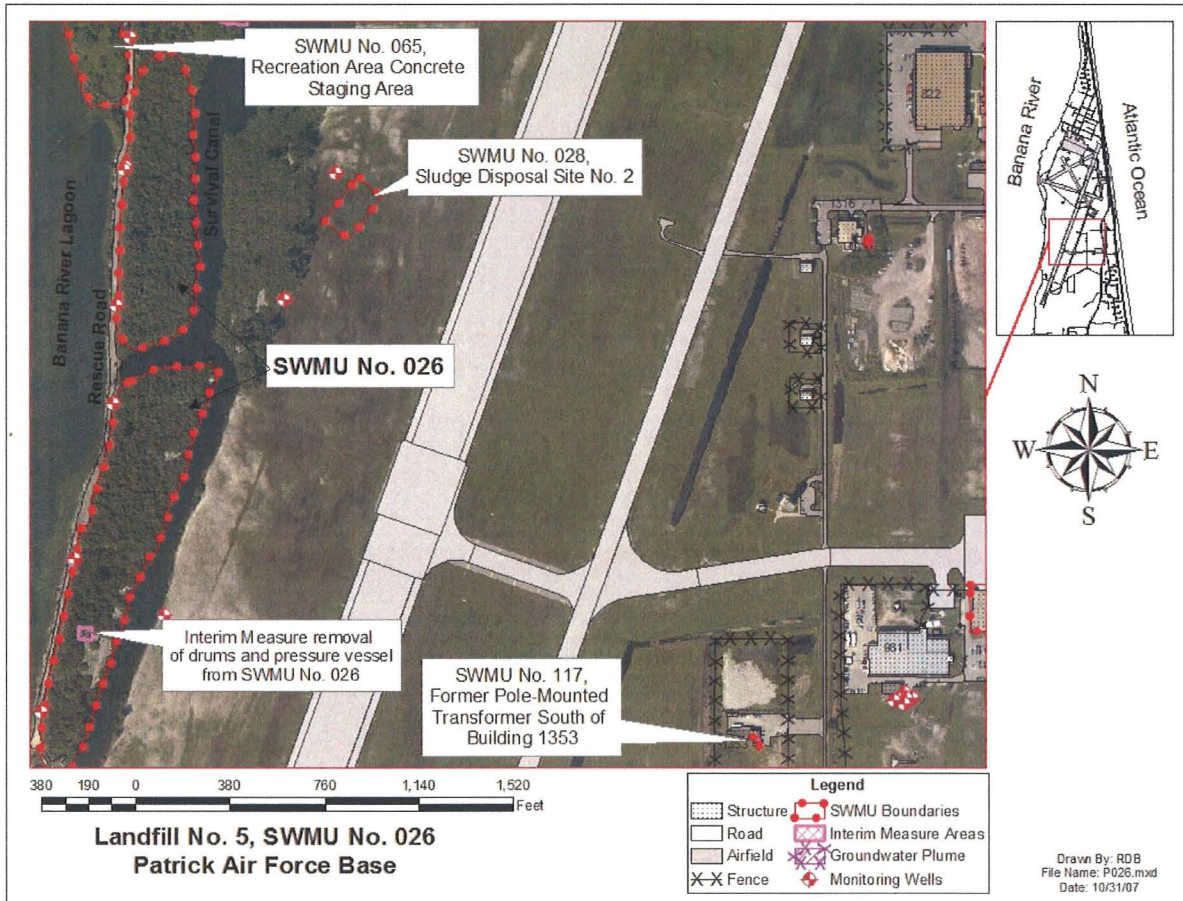
Surface Water: Metals were detected in surface water at concentrations that exceeded screening values. Surface water was included in the site's LTM program.

Sediment: No constituents were detected in sediment at concentrations that pose a risk to human health or the environment.

Soil: No constituents were detected in soil at concentrations that pose a risk to human health or the environment. However, due to the inherent liabilities associated with a landfill, controls will be instituted to ensure the soil cap is maintained.

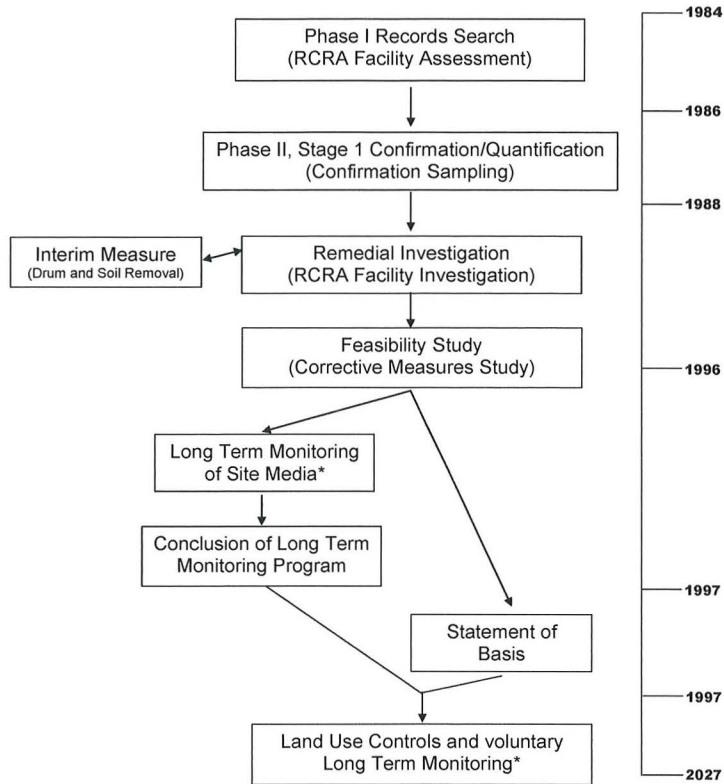
Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a Phase I Records Search was conducted in 1984, followed by a Confirmation/Quantification Study in 1987. Based on these studies, a Remedial Investigation/Feasibility Study (RI/FS) was initiated in order to fully delineate the nature and extent of contamination, to assess the risk to human health and the environment posed by site contaminants, to evaluate clean-up options, and to select the best clean-up option. During the course of the RI, an Interim Measure was performed to remove several rusted drums. The RI/FS was finalized in 1996 and recommended LTM with land use controls. The regulatory agencies approved termination of the LTM program in 1997, when it was documented that contaminant concentrations were consistently below screening values. Land use controls (LUCs) are still required as long as landfill material remains buried at the site. The LUCs have been implemented and are being maintained.

Future Actions: Termination of the LTM program was formally approved by both State and Federal regulatory agencies. However, as good stewards of the environment, the AF plans to continue voluntary LTM every five years. This decision was due to the site's status as a former landfill. Although none of the environmental media (soil, groundwater, surface water, or sediment) at the site appear to pose a risk to human health or the environment, land use controls are being maintained to preserve the integrity of the landfill. A Statement of Basis (SB) being completed for Landfill No. 5. The requirement for LUCs is documented in the Land Use Controls Implementation Plan that accompanied the SB.



IRP Process Flow Chart

SWMU No. 026 (Landfill #5, PAFB)



*Long Term Monitoring of groundwater was implemented immediately following the Corrective Measures Study (CMS), based on the recommendations in the CMS. After four rounds of quarterly monitoring, the State and EPA approved "No Further Action" for Landfill #5 because all contaminant levels in groundwater had been below screening criteria for several subsequent sampling rounds. Land Use Controls are being put in place not because of known residual contamination, but because the site's historical function as a landfill automatically precludes certain re-use scenarios and requires that the cap's integrity be maintained. As good stewards of the environment, the AF also intends to continue monitoring the groundwater on a voluntary basis to ensure that landfill contents do not cause adverse impacts in the future.

Looking east across Rescue Road into the landfill area. Photo shows fence and sign that are required by LUCs (signs were placed along the fence at intervals).



Looking south along Rescue Road. Landfill No. 5 is the area beyond the fence along the left (east) side of the road.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: LANDFILL #1 - #4, SWMU NOS. 022 through 025
INSTALLATION RESTORATION PROGRAM- SITES LF023 through LF026
PATRICK AIR FORCE BASE, FLORIDA

Current Status: LONG-TERM MONITORING OF GROUNDWATER AND SURFACE
WATER IN PROGRESS WITH LAND USE CONTROLS

Site History: Solid Waste Management Units (SWMU) Nos. 022 through 025 are four landfills that were used between 1940 and 1961 for the disposal of general base refuse including office, cafeteria and industrial materials. Subsequent to the termination of activities at these sites, dredge spoils from the Banana River were placed on the landfills as cover material. The sites are located in the south-central portion (see site map, below) of Patrick Air Force Base (PAFB). Due to the similarity of the activities that were conducted at these sites, as well as their geographic proximity to one another, these four landfills were investigated together. After landfill operations were terminated, much of the former landfill area was developed with the base golf course.

Environmental Media and Contaminants:

Groundwater: Pesticides and metals exceeded groundwater screening values. A groundwater Long Term Monitoring (LTM) program was initiated and is on-going.

Surface Water: Metals, mercury, and a semi-volatile organic compound exceeded surface water screening values. An LTM program for surface water was initiated and is on-going.

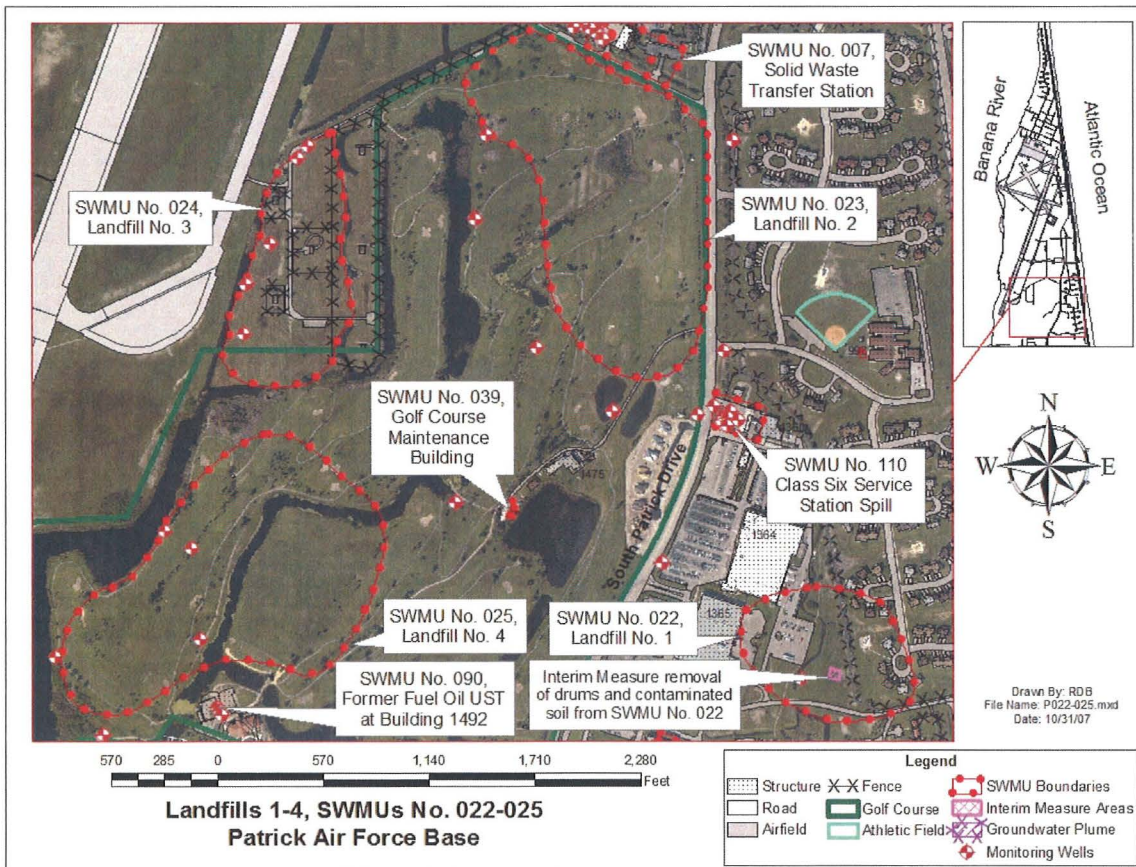
Sediment: No constituents were detected in sediment at concentration that pose a significant risk to human health or the environment.

Soil: No constituents were detected in soil at concentration that pose a significant risk to human health or the environment. However, due to inherent liabilities associated with a landfill and its contents, controls will be implemented to ensure that the soil cap is maintained.

Biota: Pesticides, mercury, a polychlorinated biphenyl, and semi-volatile organic compound were detected in fish tissue at concentrations that might pose a risk to human health if regularly consumed. The site has been posted for "catch and release."

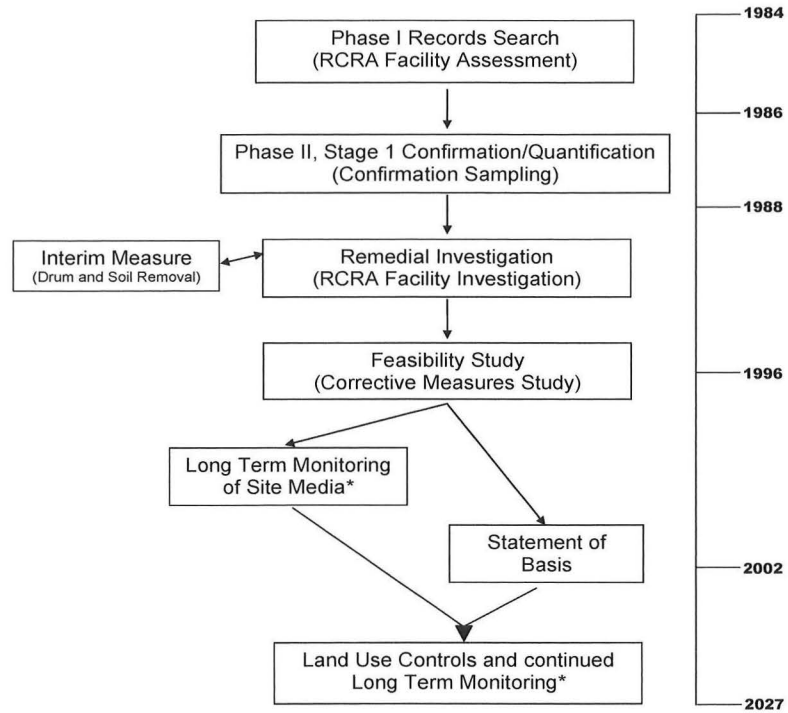
Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a Phase I Records Search was conducted in 1984, followed by a Confirmation/Quantification Study in 1987. Based on these studies, a Remedial Investigation/Feasibility Study (RI/FS) was initiated in order to fully delineate the nature and extent of contamination, to assess the risk to human health and the environment posed by site contamination, to evaluate remedial options, and to select a final remedy for the site. During the course of the RI, an Interim Measure was performed to remove buried drums and associated contaminated soils. The RI/FS Report was finalized in 1997 and recommended LTM with land use controls. LTM is on-going and land use controls have been formally implemented.

Future Actions: Based on the RI/FS Report recommendations, LTM of groundwater and surface water is on-going. Land use controls have been implemented in order to limit contact with surface water and groundwater, restrict fish consumption, and ensure that the integrity of the landfill is maintained. A Statement of Basis (SB) has been completed for Landfills 1 through 4. The land use controls are documented in the Land Use Controls Implementation Plan that accompanied the SB.



IRP Process Flow Chart

SWMU Nos. 022-025 (Landfills 1-4, PAFB)



*Long Term Monitoring of groundwater, surface water, and fish tissue was implemented immediately following the Corrective Measures Study (CMS), based on the recommendations in the CMS. This monitoring is included in the Statement of Basis as part of the "final remedy" for the four landfill sites. The AF anticipates that sometime in the near future, the regulatory agencies may approve conclusion of the formal LTM program at these Sites. (LTM is generally considered to be complete when the results from two subsequent rounds of sampling data are below screening criteria). Following completion of the formal LTM program, the AF intends to continue monitoring the groundwater on a voluntary basis to ensure that landfill contents do not cause adverse impacts in the future. Land Use Controls will be necessary regardless of the status of the formal LTM program. The areas historical function as a landfill automatically precludes certain re-use scenarios and requires that the cap's integrity be maintained



SMWU No. 023-025 are all within the confines of the Manatee Cove Country Club, shown here. This photo was taken from the intersection of Marine Road and South Patrick Drive facing north.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: PREVIOUSLY UNASSESSED FACILITIES PAFB WIDE—SA035 INSTALLATION RESTORATION PROGRAM PATRICK AIR FORCE BASE, FLORIDA

Current Status: PRELIMINARY ASSESSMENT AND CONFIRMATION SAMPLING UNDERWAY

Background: A comprehensive effort was initiated in 2004 to identify all previously unassessed facilities on Patrick Air Force Base (PAFB) warranting assessment under the Installation Restoration Program due to potential environmental contamination associated with past operations. Due to the density of facilities, the base was divided into 10 geographic zones as depicted on the installation map provided below. Approximately 1,961 past and present facilities were identified and reviewed during the PA screening process. Based on this initial screening, 465 of these facilities were recommended for a full PA. 73 of these facilities were later deferred to a separate electrical equipment PA, which was initiated in 2007 in order to identify areas at PAFB that were impacted by the use of dielectric fluid containing polychlorinated biphenyls (PCBs). Including the 73 facilities deferred from the Installation-Wide PA, over 530 historical power substations, electrical transformers, and transformer maintenance and storage areas were reviewed and assessed during the PAFB Electrical Equipment PA.

Environmental Media and Contaminants:

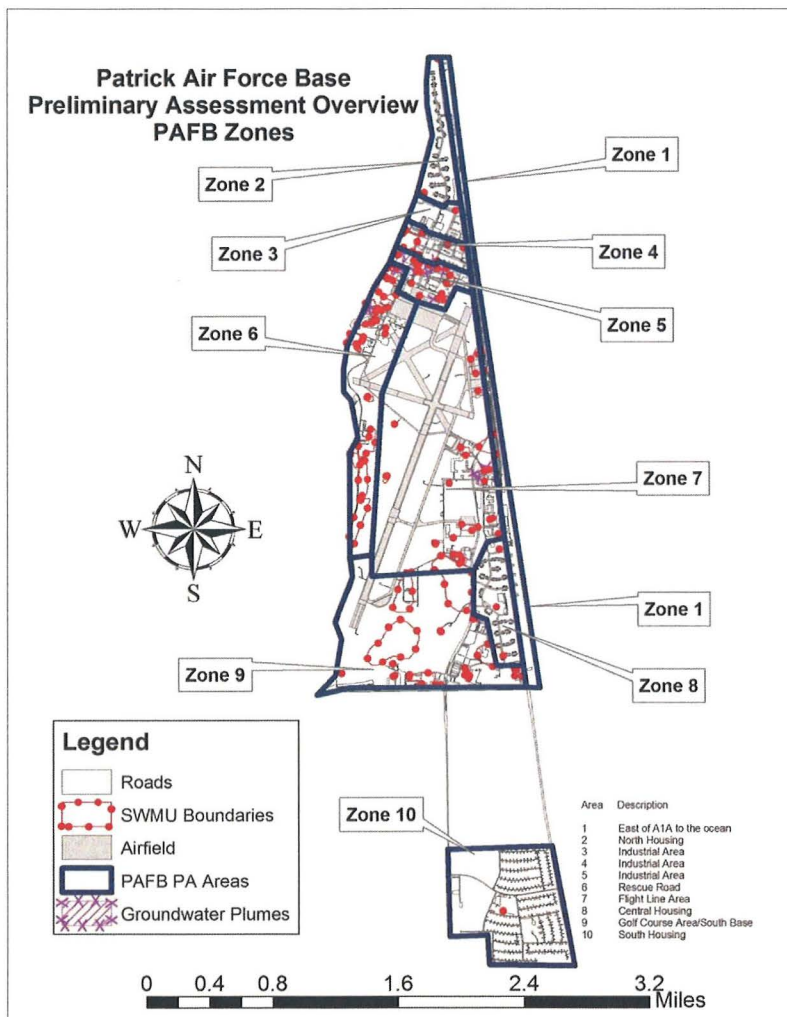
Soil: Contaminants of Concern in soil include PCBs, semi-volatile organic compounds (SVOCs), petroleum hydrocarbons, and metals.

Groundwater: Contaminants of Concern in groundwater include SVOCs, volatile organic compounds (VOCs), petroleum hydrocarbons, and metals.

Current Status: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a PA is currently being conducted in parallel with Confirmation Sampling (CS). Based on preliminary data, the Installation-Wide PA identified 271 separate "potential release locations (PRLs)" due to past operational practices and equipment. Limited CS has been completed at each of these areas, and initial analytical results indicate that constituents at 75 of the PRLs exceed regulatory standards, possibly requiring expanded CS or Interim Measures (IM).

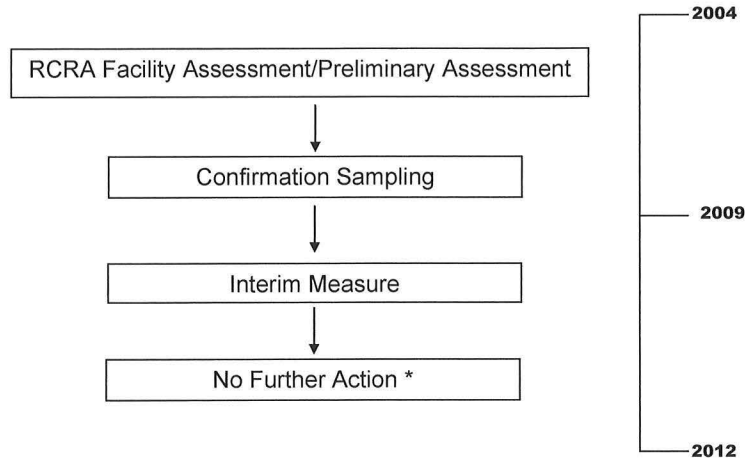
The Electrical Equipment PA recommended 148 electrical equipment facilities for CS, which is currently being initiated.

Future Actions: The Installation-Wide PA will be completed in 2008. CS activities, including expanded sampling and delineation at the 75 PRLs where exceedances were detected, are projected to be completed in 2009. Once all initial CS data is gathered and evaluated, individual Solid Waste Management Units (SWMUs) and site-specific fact sheets will be generated for each separate contaminated area. CS activities will be followed by IM implementation, which is expected to be completed in 2012. It is anticipated that the majority of these sites will be approved for No Further Action once limited IMs (likely small soil removal actions) have been performed. If residual contamination is left in any areas due to accessibility problems, then Land Use Controls may be instituted to ensure future protection of human health and the environment. If contamination is identified that warrants more robust investigation or a long term remedy, then additional actions will be specifically planned and programmed for this purpose.



IRP Process Flow Chart

Previously Unassessed Facilities, PAFB



* Long Term Monitoring or Land Use Controls may be implemented on a location by location basis. It is the intent of the IRP to remediate to residential cleanup target levels. The IRP will coordinate cleanup efforts with management for concurrence.



**UNITED STATES AIR FORCE
45TH SPACE WING**

Fact Sheet For: HANGAR 800, SWMU NO. 042
INSTALLATION RESTORATION PROGRAM- SITE DP012
PATRICK AIR FORCE BASE, FLORIDA



Current Status: NO FURTHER ACTION PLANNED FOR GROUNDWATER;
LAND USE CONTROLS FOR SOIL

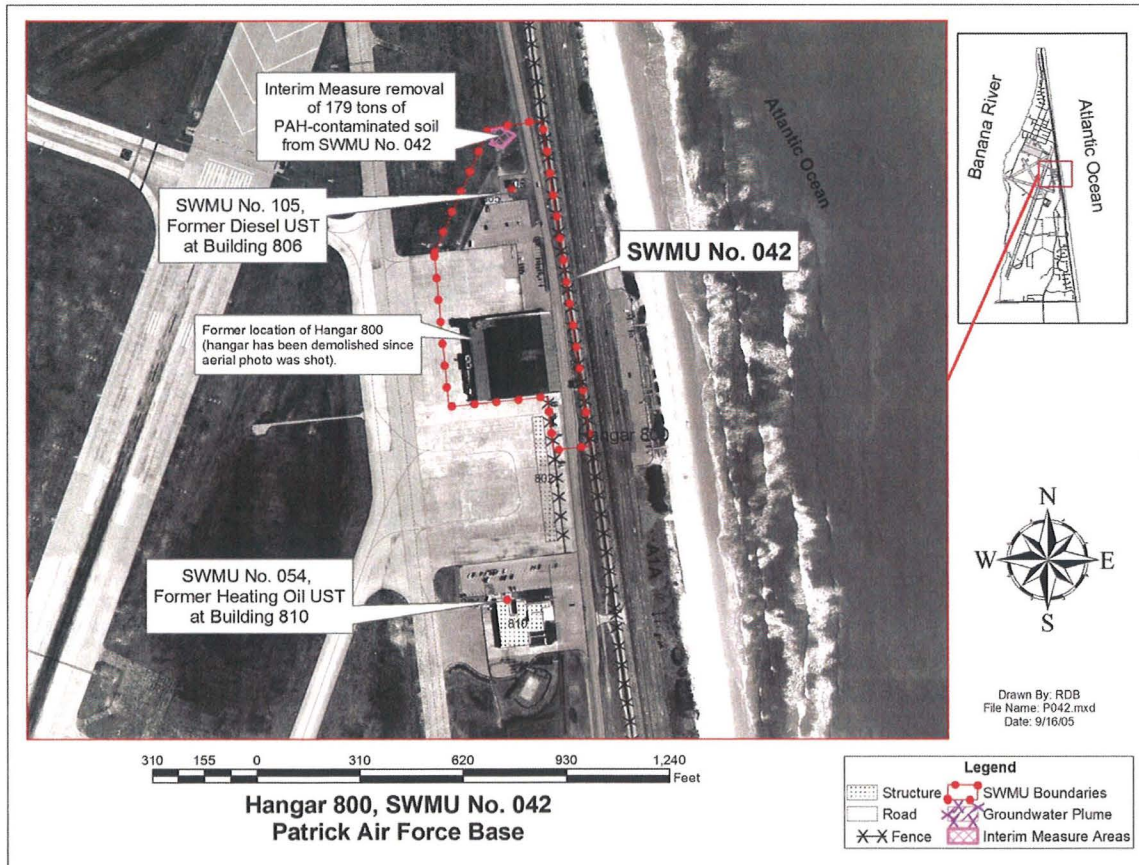
Site History: Solid Waste Management Unit (SWMU) No. 042, Hangar 800, was located east of South Patrick Drive (see site map, below) on the eastern edge of Patrick Air Force Base (PAFB). Hangar 800 has served as a control tower, an air terminal for passengers and freight, and an aircraft servicing and refueling facility since its construction in 1988. Due to past operations Hangar 800 was considered as an area of concern. The wastes generated during these activities include petroleum wastes, PCBs and waste products from industrial solvents/degreasing operations. Hangar 800 was demolished in approximately 2002 and the area has been converted to airfield apron and grass, with a low storage building (Building 802) constructed to the south.

Environmental Media and Contaminants:

- Groundwater:** Contaminants were not detected in the groundwater at concentrations that pose a risk to human health or the environment.
- Soil:** Known contaminants detected in the soil include compounds typically associated with petroleum products. The detected concentrations of these contaminants were above appropriate screening values. An Interim Measure (IM) was conducted to excavate and remove contaminated soils. Remaining soils do not exceed the standards developed by the Florida Department of Environmental Protection (FDEP) for industrial areas. Land use controls will be instituted to ensure that the site does not become a residential setting.
- Surface Water/Sediment:** No surface water bodies are located on or near the site.

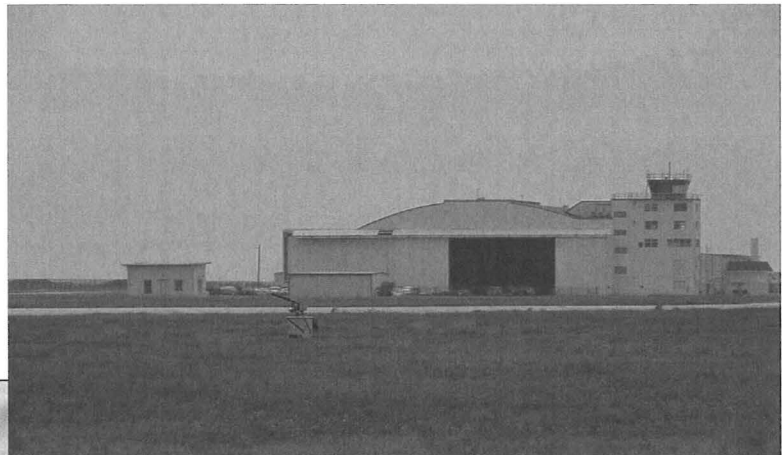
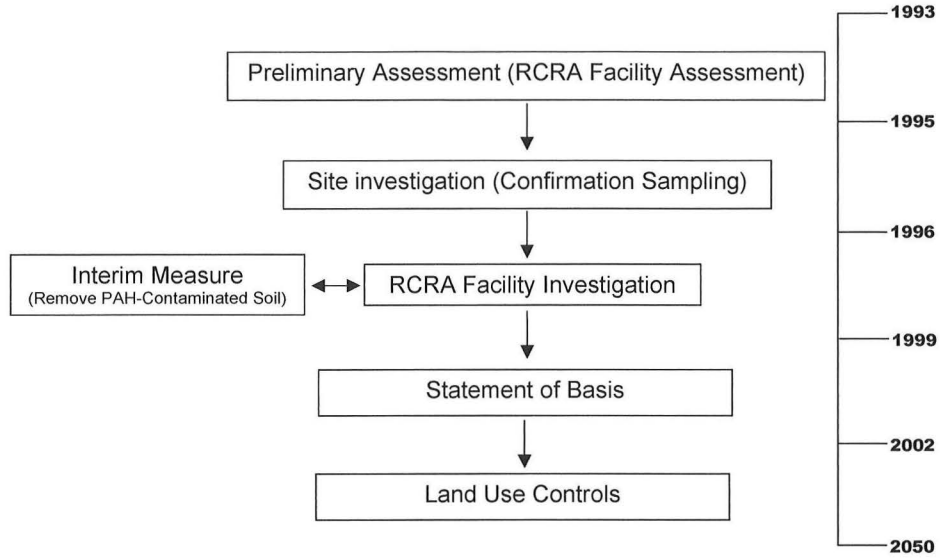
Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), a Preliminary Assessment (PA) was completed for Hangar 800 in 1993. A Site Investigation (SI) followed in 1995. Based on these investigations, a RCRA Facility Investigation (RFI) was conducted in order to fully delineate the nature and extent of contamination at the site and to assess the human health and ecological risk posed by site contaminants. Concurrent with the RFI, an IM was completed to remove petroleum-contaminated soil. The final RFI report was issued in January 1998. The RFI recommended No Further Action (NFA) for groundwater and Land Use Controls (LUCs) on soil.

Future Actions: Based on the RFI, NFA is planned for the groundwater. LUCs have been implemented for the soil in order to ensure that site use remains industrial in nature. A Statement of Basis summarizing the investigation and remedy selection process for Hangar 800 has been finalized. The required LUCs were documented therein. These controls will be maintained until residual contamination is remediated to residential concentrations or additional sampling documents that contaminant concentrations have successfully attenuated to levels safe for residential use.

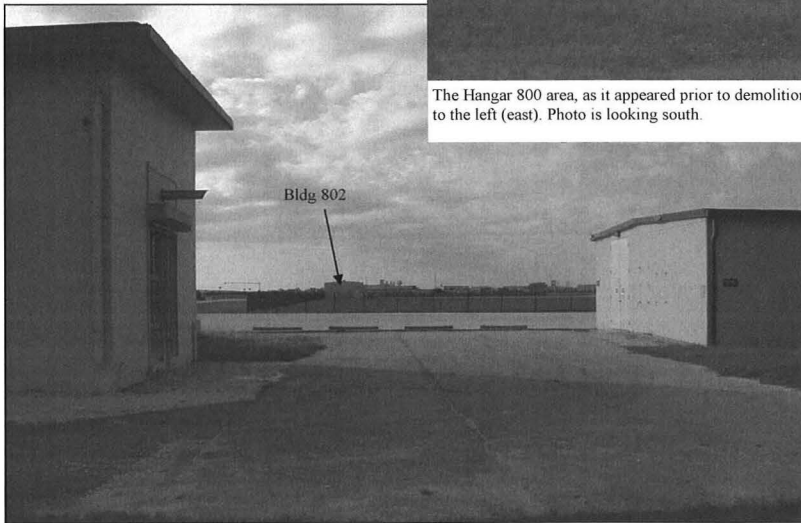


IRP Process Flow Chart

SWMU No. 042 (Hangar 800, PAFB)



The Hangar 800 area, as it appeared prior to demolition of the Hangar. South Patrick Drive is just off the photo to the left (east). Photo is looking south.



The Hangar 800 area, as it currently appears. Hangar was previously located beyond the two buildings that appear in the foreground of the photo. South Patrick Drive is just off the photo to the left (east). Photo is looking south.



Caution sign in the Hangar 800 area, as required by the soil LUCs. Sign faces east toward South Patrick Dr.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: CLASS SIX SERVICE STATION SPILL, BUILDING 1360,
SWMU NO. 110
USAF COMPLIANCE PETROLEUM PROGRAM SITE
PATRICK AIR FORCE BASE, FLORIDA

Current Status: NO FURTHER ACTION PLANNED

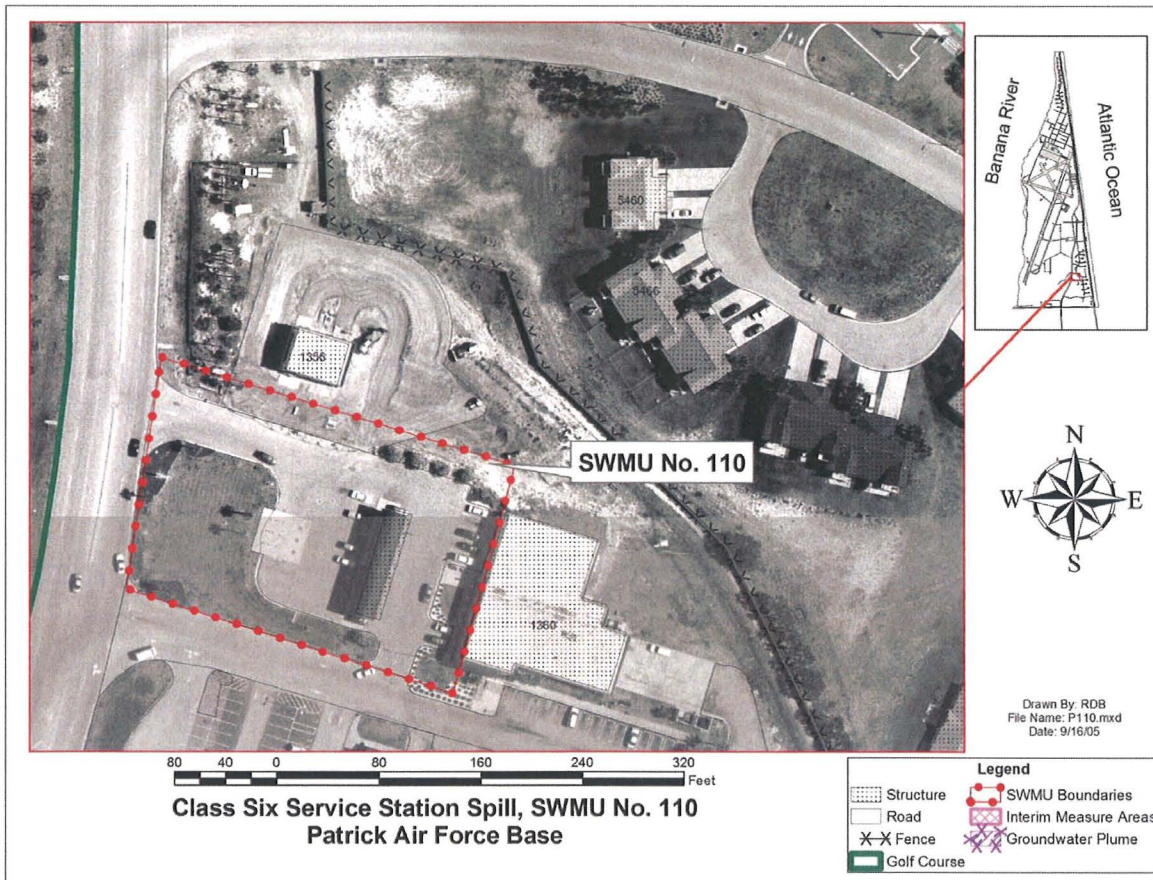
Site History: Solid Waste Management Unit (SWMU) No. 110 consists of the area west of the Class Six Service Station (Building 1360) on Patrick Air Force Base (PAFB) where a spill had occurred. The Class Six Service Station is a retail gas station and convenience store located on South Patrick Drive. The facility opened in 1995 and consists of three 10,000-gallon gasoline tanks and four dispenser pump islands. During routine groundwater testing at the site in 1996, free product was observed in a monitoring well. All assessment, cleanup, and monitoring has been addressed by the Base Environmental Compliance Program (45 CES/CEVC) under the Florida Department of Environmental Protection (FDEP) Petroleum Program.

Environmental Media and Contaminants:

This SWMU was not investigated under the Installation Restoration Program, therefore no specific sampling data is available here. However, based on data available from the Compliance Petroleum Program, no unacceptable levels of contamination remain in site environmental media.

Corrective Action Status: This Solid Waste Management Unit (SWMU) has not been investigated under the Installation Restoration Program (IRP). During routine sampling by the United State Air Force (USAF) Compliance Petroleum Program in 1996, free product was detected in one monitoring well at the site. Subsequently, a Contamination Assessment (CA) was undertaken to evaluate the status of soil and groundwater at the site. Data collected during the SA indicated the presence of petroleum groundwater contamination in the subsurface. The CA Report recommended Long Term Monitoring of groundwater. The LTM program concluded with a recommendation for No Further (NFA) in 1999. 45 CES/CEVC personnel should be contacted for a more detailed and complete summary of activities.

Future Actions: The LTM program concluded with a recommendation for NFA in 1999. As such, no further action is planned at SWMU No. 110. 45 CES/CEVC personnel should be contacted for information on site status and activities conducted under the USAF Compliance Petroleum Program.





UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: POL STORAGE AREA AT BX SERVICE STATION,
FACILITY 736, SWMU NO. 036
INSTALLATION RESTORATION PROGRAM- SITE ST029
ONE CLEANUP PROGRAM—US036
PATRICK AIR FORCE BASE, FLORIDA

Current Status: NO FURTHER ACTION PLANNED UNDER INSTALLATION RESTORATION PROGRAM; GROUNDWATER LONG TERM MONITORING ONGOING

Site History: Solid Waste Management Unit (SWMU) No. 036, Building 736 is the Base Exchange (BX) Service Station located in the north-central section (see site map, below) of Patrick Air Force Base (PAFB). The facility has been in operation since 1954. In 1973, the Service Station underwent a major renovation. The original service station was comprised of two former dispenser islands, four former 5,000-gallon steel motor gasoline underground storage tanks (USTs), one former 4,000-gallon diesel fuel UST, and associated piping. The original service station area was identified as having the potential for environmental concern. Due to these historical concerns, investigations were initiated under the Installation Restoration Program (IRP). Following assessment under the IRP, the site was transferred to the United States Air Force (USAF) Compliance Petroleum Program, which was designed to address petroleum contamination relating to tanks, particularly at facilities where petroleum storage activities are on-going.

Environmental Media and Contaminants:

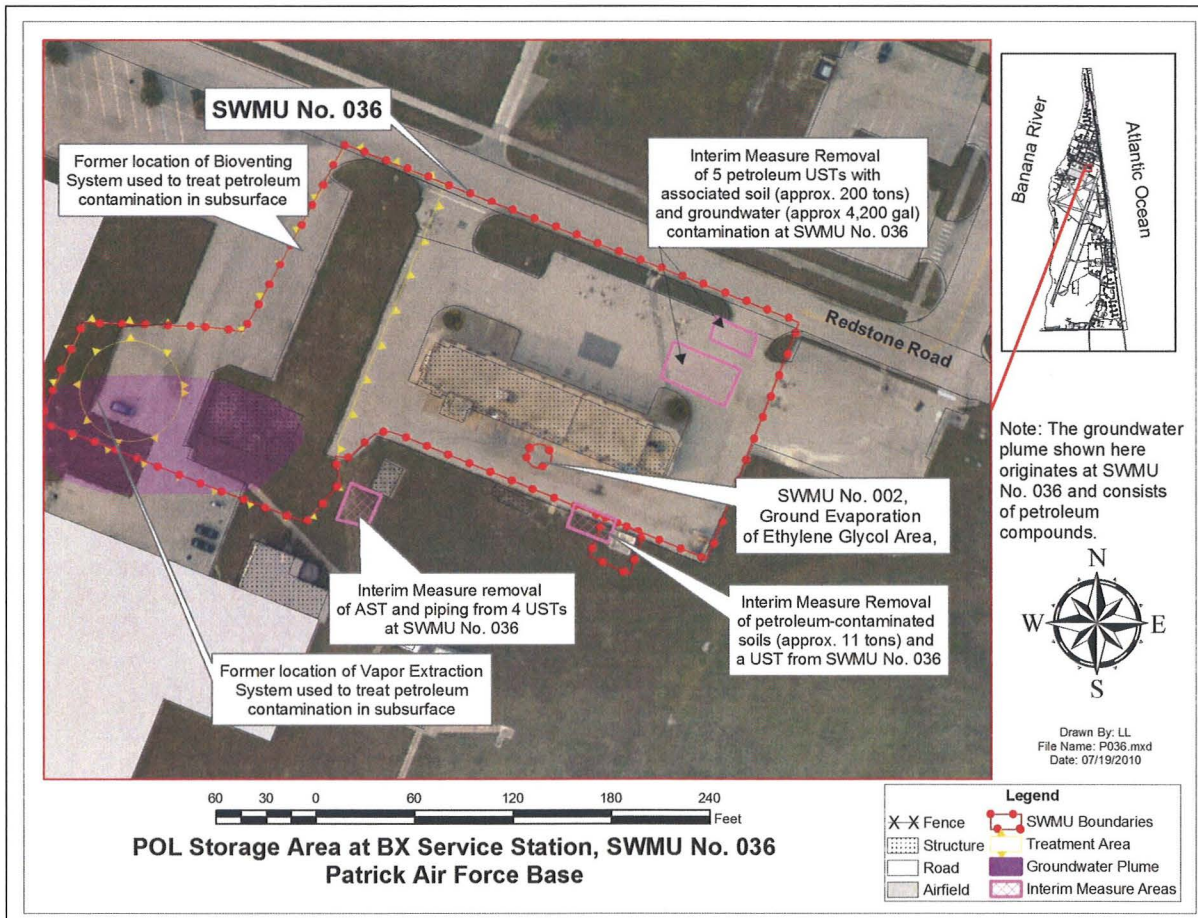
Groundwater: Contaminants identified at the site included lead and petroleum products. A Long Term Monitoring (LTM) program was initiated under the USAF Compliance Petroleum Program in order to track the decline of groundwater contamination at the site.

Soil: Contaminants detected in soil included petroleum compounds. Several leaking USTs have been removed at the site. Associated contaminated soil was removed with each UST. A bioventing system was installed to enhance the natural degradation of contaminants in remaining site soils, following bioventing, soil vapor extraction was performed. Both systems were discontinued in approximately 2001.

Surface Water and Sediment: No surface water bodies are located on or near the site.

Corrective Action Summary: In accordance with the U.S. Environmental Protection Agency's (EPA) Resource Conservation and Recovery Act (RCRA), a Phase I Records Search was completed at this site in 1986, followed by Confirmation/Quantification Sampling. Based on these studies, a Remedial Investigation was initiated in order to further characterize the nature and extent of contamination, and to evaluate potential risk to human health and the environment posed by site contaminants. These studies determined that all site contamination was petroleum-related. On this basis, the EPA approved No Further Action (NFA) at the site under the RCRA program and approved the transfer of the site to the Florida Department of Environmental Protection's Petroleum Program. Under the State Petroleum Program, a Contamination Assessment (CA) was initiated. Over the course of investigations at the site, several Interim Measures were performed to remove USTs with associated contaminated soils. Following completion of the CA under the IRP, it was determined that this site should be addressed under the USAF Compliance Petroleum Program. A Bioventing System was installed in order to promote the degradation of remaining soil contamination and LTM of groundwater was initiated in order to track the natural degradation of contaminants in groundwater. Later, soil vapor extraction was also performed. Both systems were discontinued in approximately 2001. Since the Compliance Petroleum Program has taken over the site, several additional tank and soil removals have been conducted. LTM is currently on-going under the USAF Compliance Petroleum Program.

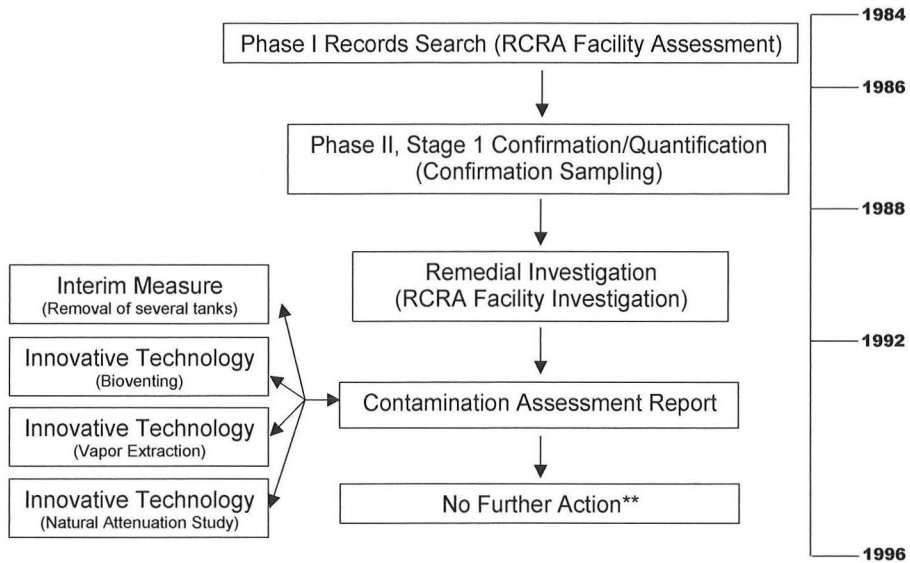
Future Actions: No future site actions are planned under the Installation Restoration Program. The site is being addressed under the USAF Compliance Petroleum Program. Currently, LTM of groundwater is being carried out under that program. Base Environmental Compliance Program (45 CES/CEVC) personnel should be contacted for additional information about site status and activities.



For further information regarding this site, please contact the 45th SW IRP Office at 853-0965.

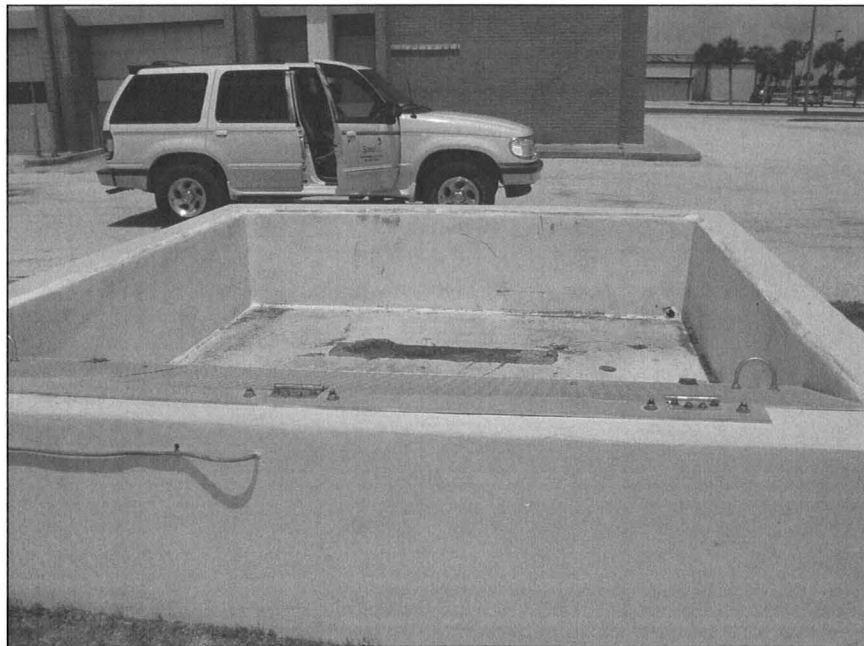
IRP Process Flow Chart*

SWMU No. 36 (POL Storage Area at BX Service Station, PAFB)



* The process followed for this site differs slightly from others, because the Site was initially investigated under the Federal Resource Conservation and Recovery Act (RCRA), then was transferred to the Florida Department of Environmental Protection Petroleum Program and was closed under that program. The phases under the Petroleum Program are roughly analogous to RCRA phases, based on their scope and intent.

** The regulatory agencies approved "No Further Action" under the IRP program. It should be noted that additional work is being carried under the AF Compliance Petroleum Program.



Former location of above ground storage tank at Facility 736.



UNITED STATES AIR FORCE 45TH SPACE WING



Fact Sheet For: TRUCK WASH, BUILDING 676, SWMU NO. 040
 INSTALLATION RESTORATION PROGRAM— SITE ST015
 ONE CLEANUP PROGRAM—SS040
 PATRICK AIR FORCE BASE, FLORIDA

Current Status: NO FURTHER ACTION PLANNED UNDER INSTALLATION RESTORATION PROGRAM IN 2011; GROUNDWATER LONG TERM MONITORING ONGOING UNDER BASE ENVIRONMENTAL

Site History: Solid Waste Management Unit (SWMU) No. 040, Building 676, is a vehicle maintenance shop located on the northwest side (see site map, below) of Patrick Air Force Base (PAFB). The facility maintains and services several types of refueling aircraft and ground fuel trucks. The facility is of concern due to previous maintenance practices which allowed small amounts of petroleum products to discharge into the catch basin north of Building 676. The catch basin subsequently drained into an oil/water separator to the west of Building 676. During periods of heavy rainfall, the oil/water separator occasionally overflowed and drained into a small pond to the west. No other releases have been reported at this facility. This facility continues to be utilized for vehicle parking and equipment storage.

Environmental Media and Contaminants:

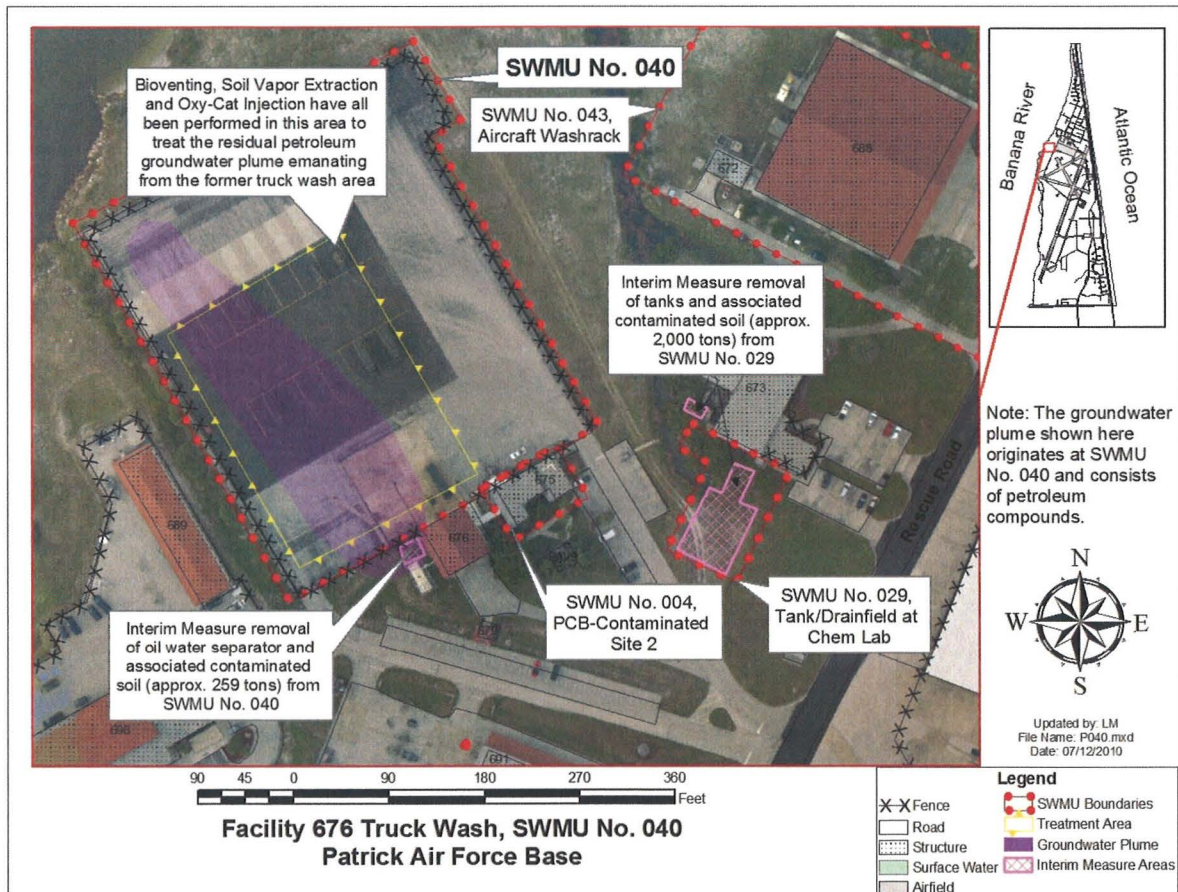
Groundwater: Petroleum products and metals were detected in groundwater. The detected concentrations of these contaminants were above appropriate screening values. Long Term Monitoring (LTM) of groundwater was instituted to ensure that groundwater contaminant concentrations continue to decline. LTM is on-going.

Soil: Petroleum products were identified in site soils. A bioventing system was installed to promote degradation of soil contaminants. That system was converted to soil vapor extraction in 2002. Both systems were subsequently discontinued in favor of oxidant injection in 2004. A natural attenuation enhancement biochemical injection took place in 2007.

Surface Water and Sediment: No surface water bodies are located on the site.

Corrective Action Summary: Due the petroleum-related nature of site contamination, the Environmental Protection Agency agreed that Building 676 should be assessed and remediated under the State Petroleum Program. An Interim Measure (IM) was conducted in 1995. The IM consisted of removing an oil/water separator and concrete sump along with associated soil in an area adjacent to and southwest of Building 676. A Petroleum Contamination Assessment was also performed in 1995. Based upon the results of these investigations, a Remedial Action Plan (RAP) was developed to address soil and groundwater containing petroleum products. This RAP was approved by the State on August 28, 1997. A bioventing system was installed at the site and began operating in October 1997 to address soil contamination. The system as operated until 2002, when it was converted to a soil vapor extraction system. LTM of groundwater was carried on concurrently with the operation of both systems. In 2005, it was determined that remaining activities at this site should be addressed under the USAF Compliance Petroleum Program. Both bioventing and soil vapor extraction were discontinued in favor of oxidant injection in 2004 to address "smear zone" and groundwater petroleum impacts. A biochemical injection was performed in 2007 to further enhance natural attenuation. The site is now undergoing LTM.

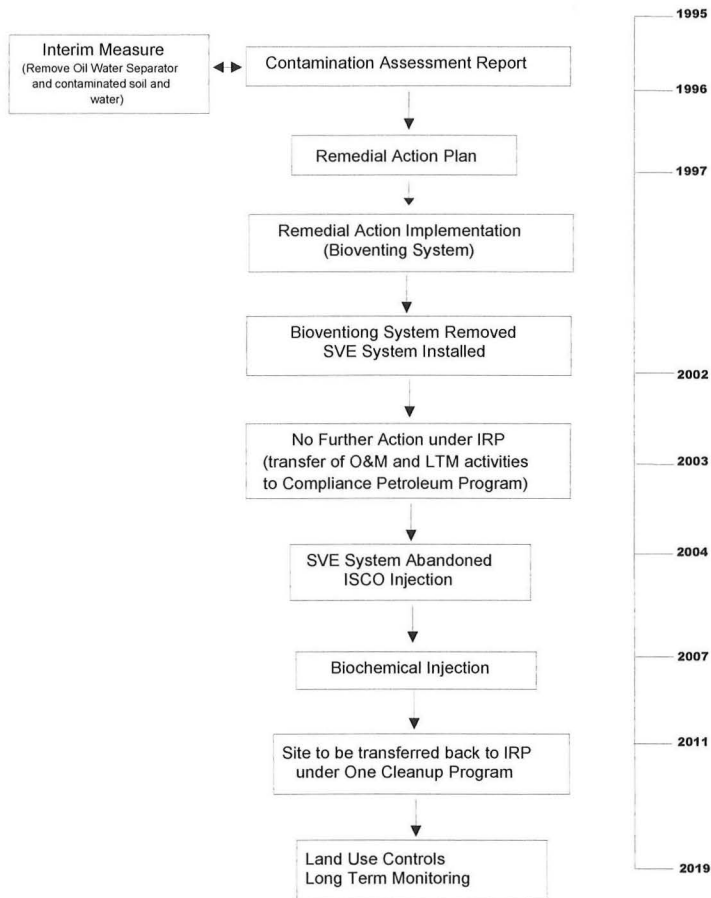
Future Actions: No future site actions are planned under the Installation Restoration Program until 2011 when the site is transferred under the One Cleanup Program. The site is currently being addressed under the USAF Compliance Petroleum Program. LTM of groundwater is being carried out under that program. Currently, Base Environmental Compliance Program (45 CES/CEVC) personnel should be contacted for additional information about site status and activities.



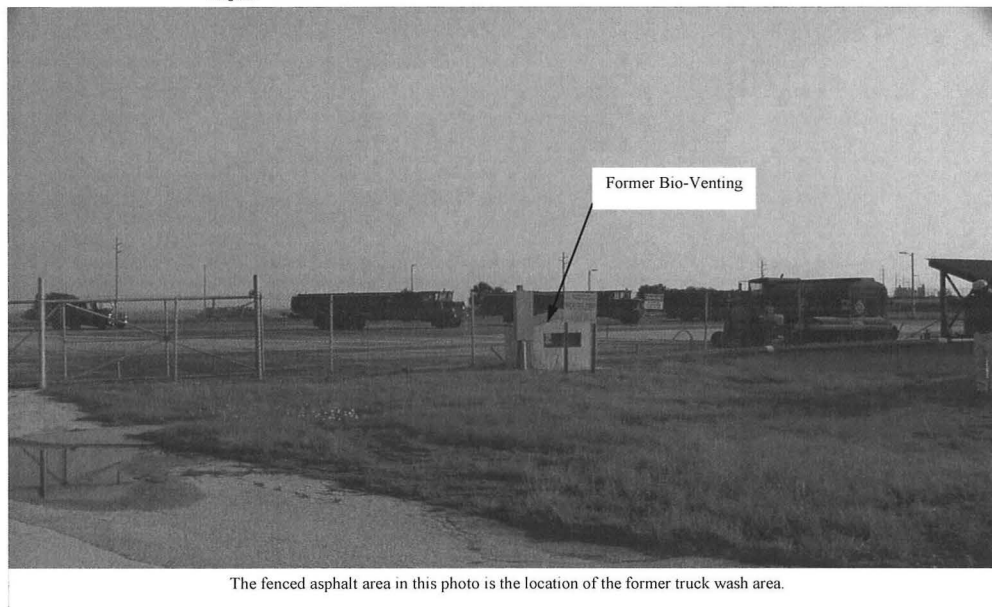
For further information regarding this site, please contact the 45th SW IRP Office at 853-0965.

IRP Process Flow Chart*

SWMU P040 (Facility 676, Truck Wash Facility, PAFB)



* The process followed for this site differs slightly from others, because the Truck Wash Facility was investigated and remediated under the Florida Department of Environmental Protection Petroleum Program, rather than the Federal Resource Conservation and Recovery Act (RCRA). The phases under the Petroleum Program are roughly analogous to RCRA phases, based on their scope and intent. The Contamination Assessment Report under the Petroleum Program might be compared to the RCRA Facility Investigation under the RCRA program. The Remedial Action phase under the State Petroleum Program roughly equates to a combination of Corrective Measures Study, Corrective Measures Design, and Corrective Measures Implementation under the RCRA Program.



For further information regarding this site, please contact the 45th SW IRP Office at 853-0965.