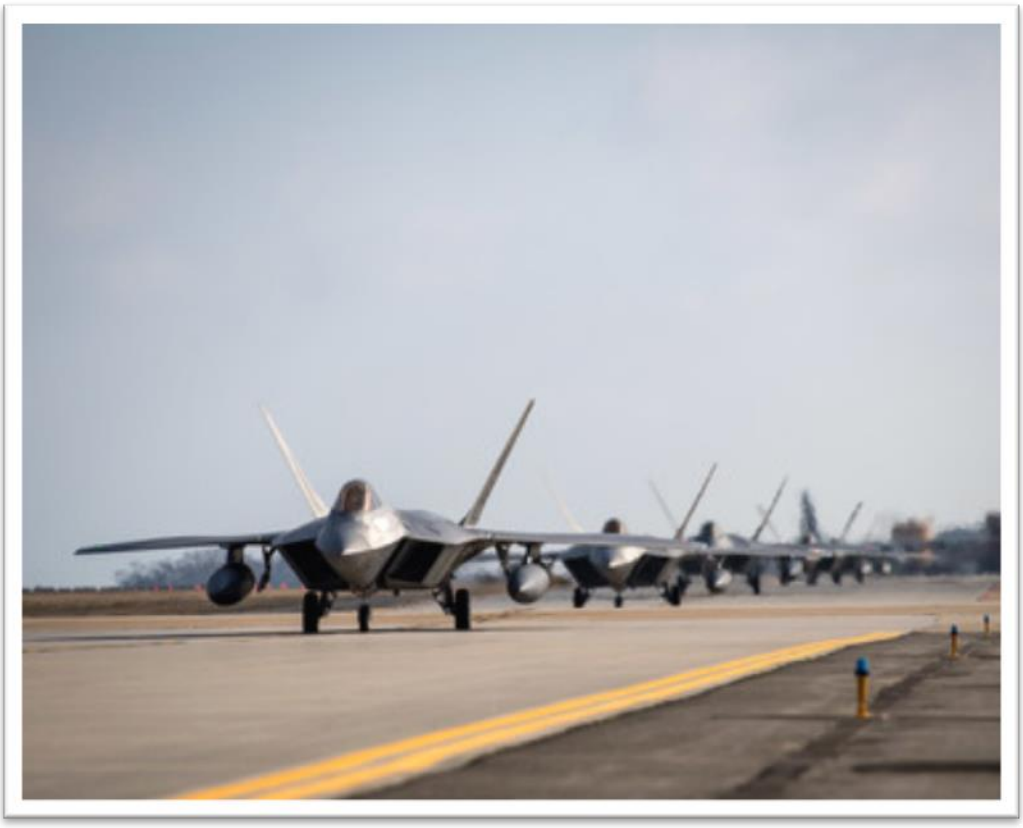
Final
Environmental Assessment
Combat Air Forces Adversary Air
Joint Base Langley-Eustis, Langley Air Force Base, Virginia

September 2019

United States Air Force
1st Fighter Wing
192d Wing

Joint Base Langley-Eustis, Langley Air Force Base, Virginia



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PRIVACY ADVISORY

This Environmental Assessment (EA) is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR Parts 1500-1508), and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP).

The EIAP provides an opportunity for public input on Air Force decision-making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

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COVER SHEET

ENVIRONMENTAL ASSESSMENT (EA) FOR COMBAT AIR FORCES ADVERSARY AIR, JOINT BASE LANGLEY-EUSTIS, LANGLEY AIR FORCE BASE

a. *Responsible Agency*: United States Air Force (Air Force)

b. *Cooperating Agency*: None

c. *Proposals and Actions:* The environmental assessment (EA) analyzes a Proposed Action to provide dedicated contract adversary air sorties for Combat Air Forces training at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley). The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the W-386, W-122, and W-72 Warning Areas. The proposed facilities at JBLE-Langley would include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; runway access; and associated parking to support the Proposed Action. Two alternatives in addition to the No Action Alternative were evaluated in the EA.

d. *For Additional Information:* Mr. David Jennings, 37 Sweeney Boulevard, JBLE-Langley, Virginia 23665-2107 or by e-mail at david.jennings.4@us.af.mil

e. *Designation:* Final EA

f. *Abstract:* This EA has been prepared pursuant to provisions of the National Environmental Policy Act, Title 42 United States Code Sections 4321 to 4347, implemented by Council on Environmental Quality Regulations, Title 40, Code of Federal Regulations (CFR) Parts 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process*. Potentially affected environmental resources were identified in coordination with local, state, and federal agencies. Specific environmental resources with the potential for environmental consequences include airspace management and use; noise; safety; air quality; biological resources; land use; socioeconomics – income and employment; environmental justice and protection of children; cultural resources; and hazardous materials and waste, contaminated sites, and toxic substances.

The purpose of the Proposed Action is to provide dedicated contract adversary air (ADAIR) sorties to improve the quality of training and readiness of pilots of the 1st Fighter Wing, 192d Wing, and other units supported by JBLE-Langley, Virginia. By providing a dedicated contract ADAIR capability, F-22 pilots would gain more realistic air-to-air training during their training syllabus tasks. Dedicated contract ADAIR would also allow the unit to free up resources used to self-generate ADAIR and more effectively use those available flying hours. Additionally, other Air Force units that are tasked to provide ADAIR training support at JBLE-Langley could recapitalize valuable flying hours to focus on increasing their own levels of proficiency and readiness.

Contract ADAIR training scenarios would include the use of combat tactics and procedures that differ from Combat Air Forces tactics to simulate an opposing force. The elements affecting JBLE-Langley include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. Elements affecting the airspace include airspace use and defensive countermeasures. The Proposed Action at JBLE-Langley would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 aircraft. Six aircraft types (MiG-29, F-5, Dassault Mirage, F-16, Eurofighter Typhoon, and JAS-39 Gripen) have been identified as capable of providing contract ADAIR support to JBLE-Langley based on performance capabilities of the aircraft and how those capabilities best meet mission training requirements at the installation. Contracted ADAIR service providers may ultimately choose another type of aircraft to support Air Force ADAIR needs at JBLE-Langley; however, any aircraft selected would need to operate within the parameters and impact levels evaluated within this EA or supplemental National Environmental Policy Act analysis would be required. The facilities proposed for use at JBLE-Langley are available and include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; runway access; and associated parking to support the Proposed Action.

The analysis of the affected environment and environmental consequences of implementing the Proposed Action and alternatives concluded that operational mitigation measures would need to be applied to the Proposed Action to reduce noise impacts to less than significant if the High Noise Scenario was implemented. With the implementation of these operational mitigation measures, in addition to the application of standing environmental protection measures and Best Management Practices, there would be no significant adverse impacts from contract ADAIR operations at JBLE-Langley or in the Warning Areas on the following resources: airspace management and use; noise; safety; air quality; biological resources; land use; socioeconomics – income and employment; environmental justice and protection of children; cultural resources; or hazardous materials and wastes, contaminated sites, and toxic substances. JBLE-Langley is an active installation with demolition and new construction actions currently underway as well as future development currently in the planning phase; however, impacts on air quality, noise, and socioeconomics – income and employment associated with construction would be minor and short in duration; therefore, significant cumulative impacts are not anticipated from activities associated with the Proposed Action when considered with past, present, or reasonably foreseeable future actions.

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)

COMBAT AIR FORCES ADVERSARY AIR
JOINT BASE LANGLEY-EUSTIS, LANGLEY AIR FORCE BASE, VIRGINIA

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code (U.S.C.) §§ 4321 to 4370h; Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) Parts 1500 through 1508; and 32 CFR Part 989, *Environmental Impact Analysis Process,* the United States (US) Air Force (Air Force) prepared the attached Environmental Assessment (EA) to address the potential environmental consequences associated with providing contract adversary air (ADAIR) sorties for improving training and readiness of pilots at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia.

Purpose and Need

The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality of training and readiness of pilots of the 1st Fighter Wing (1 FW), 192d Wing (192 WG), and other units supported by JBLE-Langley. Contract ADAIR support would employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced, simulated, combat training missions. By providing a dedicated contract ADAIR capability, F-22 pilots would gain more realistic air-to-air training during their training syllabus tasks. Dedicated contract ADAIR would also allow the unit to free up resources used to self-generate ADAIR and more effectively use those available flying hours. Additionally, other Air Force (4th generation) units tasked to provide ADAIR training support at JBLE-Langley could recapitalize valuable flying hours to focus on increasing their own levels of proficiency and readiness.

The need for action is to provide better and more realistic training for the F-22 flight training program at JBLE-Langley. Dedicated contract ADAIR is critical to improving pilot readiness as it provides realistic training opportunities to employ Combat Air Forces (CAF) tactics and procedures that optimize the training value of every mission. Contract ADAIR can be used in basic building block syllabus sorties or the very advanced and fluid environment of multiaircraft air combat required by the training syllabus.

Description of Proposed Action and Alternatives

The Proposed Action would provide dedicated contract ADAIR sorties for CAF training at JBLE-Langley to address shortfalls in F-22 pilot training and production capability and to provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced training missions. Training scenarios would include the use of combat tactics and procedures that differ from CAF tactics to simulate an opposing force. The elements affecting JBLE-Langley include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the airspace include airspace use and defensive countermeasures.

The Proposed Action at JBLE-Langley would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 aircraft. Six aircraft types (MiG-29, F-5, Dassault Mirage, F-16, Eurofighter Typhoon, and JAS-39 Gripen) have been identified as capable of providing contract ADAIR support to F-22 CAF aircrews stationed at JBLE-Langley. One or a combination of these aircraft types may be operated by a contractor at JBLE-Langley in support of ADAIR training for contract ADAIR selection based on performance capabilities of the aircraft and how those capabilities best meet mission training requirements at the installation. The facilities proposed for use at JBLE-Langley are available and include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; runway access; and associated parking to support the Proposed Action. Approximately 4,000 sorties annually would support training activities within nearby special use airspace including Warning Areas W-386, W-72, and W-122. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

In addition to the No Action Alternative, two alternatives for the proposed contract ADAIR were identified for evaluation in the EA. These alternatives are described below and represent various options for facility use at JBLE-Langley.

Alternative 1

Contract ADAIR capabilities would be established using an estimated 14 aircraft providing 4,100 annual sorties at JBLE-Langley. Of the 4,100 annual sorties, 4,000 training sorties would occur in Warning Areas W-386, W-72, and W-122. The remaining sorties are expected for aircraft leaving for or returning from either maintenance or other deployments. Operations and maintenance activities and aircrew briefings would be consolidated in Building 751.

Alternative 2

Alternative 2 would be the same as described in Alternative 1 except operations would be combined with the T-38 ADAIR mission in Building 790, while maintenance and hangar space would be collocated in Building 751.

No Action Alternative

No action means that an action would not take place, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. No action for this EA reflects the status quo, where no contract ADAIR support at JBLE-Langley would occur.

Summary of Findings

Potentially affected environmental resources were identified through communications with state and federal agencies and review of past environmental documentation. Specific environmental resources with the potential for environmental consequences include airspace management and use; noise; safety; air quality; biological resources; land use; socioeconomics – income and employment; environmental justice and protection of children; cultural resources; and hazardous materials and wastes, contaminated sites, and toxic substances.

Under the Proposed Action, the annual number of operations would increase by 25 percent and would not impact the operational capacity or necessitate changes to the locations or dimensions of the airspace around JBLE-Langley. Potential impacts on the airspace around the airfield for Alternatives 1 and 2 would be negligible. Likewise, the Warning Areas proposed for use have the capacity and the dimensions necessary to support additional sorties; therefore, negligible impacts on airspace are anticipated for Alternatives 1 and 2.

Under the Low and Medium Noise Scenarios, long-term negligible to minor increases in noise from the addition of contract ADAIR flight operations in the vicinity of the JBLE-Langley airfield are anticipated. These impacts are primarily the slight elongation of the day-night noise level (DNL) contours along the extended centerline of Runway 08/26 and the slight expansion for the DNL contours perpendicular to the runway. Under the High Noise Scenario, proposed contract ADAIR operations would increase noise levels greater than a 3-A-weighted-decibel (dBA) DNL resulting in potentially significant impacts for Alternatives 1 and 2. The increases in the DNL under the High Noise Scenario were as high as 8 dBA above the baseline condition at select sensitive noise receptors designated as points of interest (POIs; e.g., schools, places of worship) near the airfield. Mitigation measures to reduce the impacts to a less than significant level if the High Noise Scenario for contract ADAIR is implemented are described in EA Section 4.2.2.2 and Appendix E. Once the selected contract ADAIR aircraft are known, the Air Force would analyze and document the most effective mitigation scenarios for the selected aircraft. The ultimate need for mitigation would be determined by the actual aircraft used for contract ADAIR if the High Noise Scenario is implemented. With mitigation, the implementation of the High Noise Scenario would have potential moderate, long-term noise impacts. There would be a slight increase in noise from additional contract ADAIR subsonic and/or supersonic flight operations in Warning Areas W-386, W-72, and W-122; however, there would be no impact on people from noise as these Warning Areas are located over the Atlantic Ocean.

Safety zones around the airfield are not expected to change. Buildings associated with contract ADAIR are located outside of identified Quantity-Distance arcs; therefore, no impacts on explosives safety are anticipated. With an established crash damaged or disabled aircraft recovery program and implementation of all applicable Air Force Office of Safety and Health and Occupational Safety and Health Administration requirements, no significant impacts on ground safety are expected to occur. No

significant impacts are expected to flight safety under the implementation of contractor flight safety rules and bird/wildlife-aircraft strike hazard (BASH) procedures.

The air quality analysis using the Air Conformity Applicability Model in the Draft EA (July 2019) was conducted using default settings resulting in artificially high nitrogen oxides for the High Scenario. Revised modeling was performed for the Final EA to include proposed site-specific details (including removing trim tests performed by contract aircraft at JBLE-Langley). Increased air emissions resulting from contract ADAIR operations at JBLE-Langley are not considered significant under Alternatives 1 and 2. The proposed project would not interfere with the region's ability to maintain compliance with National Ambient Air Quality Standards for attainment area pollutants. Warning Areas W-386, W-72, and W-122 are not in regulatory control areas and are beyond state jurisdictional boundaries; moreover, modeling indicates that emissions would be dispersed over a wide area and are not expected to have significant impacts on air quality within the Warning Areas.

Noise impacts from increased operations at JBLE-Langley would have a negligible, short-term and long-term effect on wildlife. Risk reduction implementation measures associated with the BASH program would continue to reduce BASH potentially resulting in a minor impact on birds and other wildlife. No federally listed species are present at JBLE-Langley; therefore, no impacts are anticipated to any listed species from aircraft operations at the airfield. A slight increase in noise and sonic booms from supersonic flights are expected in the Warning Areas during training activities; however, these negligible noise increases would not impact wildlife in the Warning Areas. The use of chaff and flares would have no direct impact on wildlife; however, small plastic caps and pistons associated with the use of defensive countermeasures could make it to the surface of the Atlantic Ocean. The Air Force has found that these small residual plastic components could be consumed by birds, marine mammals, and sea turtles. As such, the use of defensive countermeasures during training activities in the Warning Areas may affect but is not likely to adversely affect listed birds foraging on the surface of the Atlantic Ocean, marine mammals, and sea turtles. There would be no impact on designated Critical Habitat. The Air Force received concurrence with its may affect but not likely to adversely affect determination for federally listed species under the National Marine Fisheries Service jurisdiction from the National Marine Fisheries Service and no effect determination from the US Fish and Wildlife Service, Virginia Field Office.

Changes to the noise setting from increased noise levels under the High Noise Scenario would result in potential significant, long-term impacts on land use compatibility because of the up to 8-dBA DNL increase above the baseline condition at select noise-sensitive receptors designated as POIs (e.g., schools, places of worship) near the airfield. Mitigation measures, as described in Section 4.2.2.2, would reduce the impacts from noise to moderate for select POIs.

No ground disturbance would take place as part of the Proposed Action at JBLE-Langley; therefore, potential archaeological deposits would not be impacted. Under Alternatives 1 and 2, the proposed Hangar 751 is presently considered eligible for inclusion in the National Register of Historic Places as a contributing element of the Langley Field Historic District. The character defining features of Hangar 751 are located on the exterior; therefore, potential interior modifications are not expected to affect any characteristics that contribute to the hangar's historic significance and there would be no adverse effect on historic properties. No impacts on historic properties would occur from contract ADAIR training in the Warning Areas.

Because there is no new construction proposed at JBLE-Langley, the interior upgrades to facilities for contract ADAIR operations would require only a small amount of supplies and labor and therefore, would not impact the existing economic environment. The 109 contracted ADAIR maintenance personnel and pilots would represent a small increase to the 20,000 military and civilian personnel currently employed at JBLE; therefore, no adverse impacts on socioeconomics – income and employment would occur.

Increased noise at sensitive receptors would occur near the airfield. Some sensitive receptors, which includes residential neighborhoods, would experience up to an 8-dBA DNL increase in noise levels associated with the contract ADAIR aircraft; therefore, under the High Noise Scenario, noise impacts could cause some existing properties to decrease in value resulting in potentially significant economic impacts under all alternatives. Mitigation measures to reduce the impacts from noise under the High Noise Scenario are described in EA Section 4.2.2.2 and Appendix E. With the implementation of mitigation, impacts on property values would be minor.

No disproportionate impacts on minority or low-income populations or children would occur under the Low and Medium Noise Scenarios; however, potentially disproportionate impacts on minority populations near JBLE-Langley from increased noise under the High Noise Scenario with all alternatives could occur. Further, under the High Noise Scenario, potentially significant impacts could occur to children in educational and daycare facilities because of the up to 8-dBA DNL increase in noise levels. Mitigation measures to reduce the impacts from noise under the High Noise Scenario are described in EA Section 4.2.2.2 and Appendix E. With the implementation of mitigation, no disproportionate impacts on minorities in nearby communities would occur and impacts on children in education facilities would be reduced to moderate and long-term.

Hazardous wastes generated as a result of contract ADAIR operations would be stored and disposed in accordance with the JBLE-Langley *Hazardous Waste Management Plan*; therefore, no impacts from managing hazardous waste are expected. No impacts are expected from asbestos-containing materials and lead-based paint from interior renovations of proposed facilities with implementation of requirements described in the JBLE-Langley *Asbestos Management Plan*. Lighting fixtures containing polychlorinated biphenyls would be disposed in accordance with federal, state, and local laws, which would result in a long-term, minor, beneficial impact. There is a low potential for radon to pose a health hazard at JBLE-Langley. As such no impacts from radon are anticipated. There is no environmental contamination known to occur within the project area.

Cumulative Impacts

The EA considered cumulative impacts that could result from the incremental impact of the proposed project when added to other past, present, or reasonably foreseeable future actions. No potentially significant cumulative impacts were identified for JBLE-Langley or the Warning Areas.

Although the recent action by US Court of Appeals could result in the redesignation of the Hampton Roads Air Quality Control Region as an ozone maintenance area, the worst-case scenario for contract ADAIR emissions for the pollutants of concern (nitrogen oxides [NO_X] and volatile organic compounds) are over 30 percent less than the 100 tons per year *de minimis* threshold for conformity. Further, the worst-case emission (i.e., the highest NO_x emission) is only 0.080 percent of the countywide stationary source NO_x emissions. Therefore, no cumulative air quality impact is anticipated.

The EA included past, present and reasonably foreseeable future projects that could add incrementally to impacts from the Proposed Action. Federal and nonfederal actions with the potential to cause cumulative impacts were described in **Tables 5-1** and **5-2**. There are presently no actions considered to have the potential to create cumulative impacts on resources.

Mitigation

Best Management Practices are described and recommended in the EA where applicable.

The EA analysis concluded that if the Low or Medium Noise Scenario contract ADAIR aircraft are selected, the Proposed Action and alternatives would not result in significant environmental impacts; however, if the Proposed Action is implemented and the High Noise Scenario contract ADAIR aircraft are selected, mitigation to reduce noise impacts at select POIs near JBLE-Langley is required. Noise analyses conducted for the Proposed Action indicate that the noise exposure at JBLE-Langley may increase significantly with the proposed addition of contract ADAIR flight training operations under the High Noise Scenario and specifically for the straight-in arrival operations by these High Noise Scenario aircraft; therefore, to reduce the potentially significant impacts from noise on POIs under the High Noise Scenario, operational noise mitigation studies were conducted with a goal of reducing noise at the POIs in the vicinity of the airfield so that no POIs experience a greater-than-3-dBA DNL increase as a result of the Proposed Action.

Based on the evaluation of five possible mitigation scenarios, Mitigation Scenarios 2 and 5 were the most reasonable to implement and would cause the fewest operational concerns in conjunction with implementation of the Proposed Action. A Mitigation Plan has been prepared and is included in the EA as Appendix E.

The High Noise Scenario was analyzed in the EA as the "worst-case" scenario and assumes that the noisiest aircraft would be selected for use for contract ADAIR operations. Without appropriate mitigation, the High Noise Scenario could result in potentially significant impacts for all alternatives. Section 4.2.2.2 of the EA explains the various mitigation options that would, individually or in combination, be implemented. Under the High Noise Scenario, the 1 FW and 192 WG would implement mitigation measures, as feasible and appropriate, to reduce noise impacts near JBLE-Langley to less than significant. The mitigation would only apply if aircraft similar to the High Noise Scenario are chosen as the contract ADAIR aircraft. If contract ADAIR aircraft similar to the Medium or Low Noise Scenario are chosen, no mitigation would be required. The ultimate need for mitigation would be determined by the actual aircraft used for contract ADAIR. Once the selected aircraft are known, the Air Force would analyze and document the most effective mitigation scenarios for the selected aircraft.

Conclusion

Finding of No Significant Impact. After review of the EA prepared in accordance with the requirements of NEPA; CEQ regulations; and 32 CFR Part 989, *Environmental Impact Analysis Process,* and which is hereby incorporated by reference, I have determined that the proposed activities to provide dedicated contract ADAIR sorties to improve the quality of training and readiness of pilots of the 1 FW, 192 WG, and other supported units located at JBLE-Langley, Virginia, with the implementation of operational mitigation for High Noise Scenario contract ADAIR aircraft as outlined in Section 4.2.2.2 and Appendix E (as required), would not have a significant impact on the quality of the human or natural environment. Accordingly, an Environmental Impact Statement will not be prepared. This decision has been made after considering all submitted information, including a review of agency comments submitted during the 30-day public comment period, and considering a full range of practical alternatives that meet project requirements and are within the legal authority of the United States Air Force.

Dee Jay Katzer — 30 Sep 19

DEE JAY KATZER, Colonel, USAF — **DATE**
Chief, Civil Engineer Division (ACC/A4C)

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FINAL

ENVIRONMENTAL ASSESSMENT (EA)

FOR

COMBAT AIR FORCES ADVERSARY AIR
JOINT BASE LANGLEY-EUSTIS, LANGLEY AIR FORCE BASE, VIRGINIA

PREPARED FOR:

Department of the Air Force

September 2019

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/m^3	microgram(s) per cubic meter
°F	degree(s) Fahrenheit
1 FW	1st Fighter Wing
1 MXS	1st Maintenance Squadron
192 MXS	192d Maintenance Squadron
192 WG	192d Wing
633 ABW	633d Air Base Wing
733 LRS	733d Logistics Readiness Squadron
ac	acre(s)
ACAM	Air Conformity Applicability Model
ACC	Air Combat Command
ACM	asbestos-containing materials
ADAIR	adversary air
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AGE	Aerospace Ground Equipment
AGL	above ground level
AGRS	aggressor squadron
AICUZ	Air Installation Compatible Use Zone
Air Force	United States Air Force
AMU	Aircraft Maintenance Unit
ANG	Air National Guard
APE	Area of Potential Effects
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
AST	aboveground storage tank
ATC	Air Traffic Control
BACT	Best Available Control Technologies
BASH	bird/wildlife-aircraft strike hazard
BMP	Best Management Practice
CAA	Clean Air Act
CAD/PAD	cartridge-actuated device(s)/propellant-actuated device(s)
CAF	Combat Air Forces
CDDAR	crash damaged or disabled aircraft recovery
CDNL	C-weighted Day-Night Average Sound Level
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COC	contaminant of concern
CPSC	Consumer Product Safety Commission
CSAF	Chief of Staff Air Force
CSEL	C-Weighted Sound Exposure Level
CWA	Clean Water Act
CZ	Clear Zone
CZMA	Coastal Zone Management Act
dB	decibel(s)
dBA	A-weighted decibel(s)
DLA	Defense Logistics Agencies

LIST OF ACRONYMS AND ABBREVIATIONS

DNL	Day-Night Average Sound Level
DOD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FL	Flight Level
FONSI	Finding of No Significant Impact
FR	Federal Register
ft	foot(feet)
ft^2	square foot(feet)
FTU	formal training unit
gal	gallon(s)
GHG	greenhouse gas
GWP	global warming potential
HAZMART	hazardous material pharmacy
HAZMAT	hazardous material(s)
HTA	Heavier-than-Air
IDP	Installation Development Plan
INRMP	Integrated Natural Resources Management Plan
ISR	Intelligence, Surveillance, and Reconnaissance
JBLE	Joint Base Langley-Eustis
JLUS	Joint Land Use Study
km	kilometer(s)
LaRC	Langley Research Center
LBP	lead-based paint
L_{dn}	Day-Night Average Sound Level
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
LRS	Logistics Readiness Squadron
LTA	Lighter-than-Air
MBTA	Migratory Bird Treaty Act
mg/m^3	milligram(s) per cubic meter
mi	mile(s)
MMPA	Marine Mammal Protection Act
MMRP	Military Munitions Response Program
MOU	Memorandum of Understanding
MRA	Munitions Response Area
MRS	Munitions Response Site
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NH_3	ammonia
NHPA	National Historic Preservation Act
NM	nautical mile(s)
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration

LIST OF ACRONYMS AND ABBREVIATIONS

NO_x	nitrogen oxides
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
pCi/L	picocurie(s) per liter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
POI	point of interest
ppm	part(s) per million
PSD	Prevention of Significant Deterioration
psf	pound(s) per square foot
PTE	potential to emit
PWS	*Performance Work Statement for the Combat Air Forces (CAF) Contracted Air Support (CAF CAS)*
Q-D	quantity-distance
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
RONA	Record of Nonapplicability
SARA	Superfund Amendments and Reauthorization Act
SEL	Sound Exposure Level
SER	Significant Emission Rate
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
TPH	total petroleum hydrocarbons
tpy	ton(s) per year
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VOC	volatile organic compound
yd^2	square yard(s)

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CHAPTER 1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force) is tasked with the defense of the United States (US) and fulfillment of its Title 10 United States Code (U.S.C.) mission. The Air Force's mission is to fly, fight, and win - in air, space, and cyberspace. In order to accomplish this mission, it is critical that combat pilots, and the Airmen supporting them, adequately train to attain proficiency on tasks they must execute during times of war and further to sustain this proficiency as they serve in the Air Force. Increasingly, fighter pilots of the Combat Air Forces (CAF) have been operating at degraded levels of proficiency and training readiness due to diminishing fiscal resources. For the purpose of this effort, the CAF includes all active duty, Air National Guard (ANG), and Air Force Reserve units in both formal training units (FTUs) and operational units.

Ideally, CAF fighter pilots would be able to maintain their proficiency by flying 200 or more hours per year, practicing training syllabus tasks, tactics, and procedures. Unfortunately, for much of the last decade, pilots of advanced weapons platforms have been falling 25 to 40 percent short of the flying hours recommended to build and sustain their proficiency on required training tasks (Venable, 2016). At the same time, increasingly complex aircraft and technologies require more time to master the full range of skills required to become proficient combat-ready pilots. Along with insufficient budgets to support the flying hours/training requirements needed by CAF pilots, they have also had to support adversary air (ADAIR) flying missions that have minimal training value to the CAF pilots themselves. ADAIR missions simulate an opposing force that provides a necessary and realistic combat environment during CAF training missions. Flying these ADAIR sorties requires the use of potential adversaries' tactics and procedures that may differ significantly from CAF tactics and procedures and therefore provides minimal CAF training while taking up valuable flying hours that could otherwise be spent on core training tasks. In many cases, minimal ADAIR missions, or none at all, have been available to support pilot training and have resulted in degraded readiness for CAF pilots who are expected to operate some of the most sophisticated weapons platforms in the world.

A SORTIE IS DEFINED AS A SINGLE MILITARY AIRCRAFT FLIGHT FROM INITIAL TAKEOFF THROUGH FINAL LANDING.

During his confirmation hearing, Chief of Staff of the Air Force (CSAF), General David Goldfein, identified a growing crisis in the readiness of CAF pilots (Venable, 2016):

> *Less than half of Air Force combat units are ready for "full-spectrum" (high threat, high intensity) combat. This lack of readiness could jeopardize the lives of aircrews and other service members who depend upon them in combat and put mission-essential tasks at great risk.*

1.1.1 *Background*

Air Force readiness is currently affected by several issues including training, weapon system sustainment, and facilities. While all are critical, training in particular has become an increasing concern as worldwide commitments, high operations tempo, and fiscal and manpower limitations detract from available training resources. As an example, the Budget Control Act of 2011, as implemented in 2013, reduced flying hours by 18 percent and temporarily stood down 17 of 40 combat-coded squadrons (The Heritage Foundation, 2015). The Air Force prioritized readiness in 2014, but shortfalls in readiness were not eliminated and have persisted through the present day as indicated by the CSAF's acknowledgement of the lack of readiness in more than half of the service's combat units. In the training arena, readiness issues are manifested by multiple issues such as 1) an inability to internally support ADAIR without a corresponding sacrifice in scarce flying hours and normal training objectives; 2) a lack of advanced threat aircraft to provide representative ADAIR for realistic training; 3) a fighter pilot manning crisis, necessitating increased pilot production beyond sustainable levels; and 4) granting excessive syllabus waivers to graduates of the Air Force Weapons School due to inadequate ADAIR support during final training phases.

Lack of available ADAIR is degrading levels of pilot readiness and contributing to the overall decline in availability of proficient CAF pilots. The arrangement in which CAF ADAIR sorties are currently organized is depicted on **Figure 1-1**. At present, the current approach meets less than 50 percent of the total ADAIR requirement across the Air Force.

Self-generated ADAIR can either be "in-house" supporting daily flying schedules or via a dedicated tasking to support an external unit, both referred to as "Red Air." In both the "in-house" and "dedicated" options, performing self-generated ADAIR is at the expense of the tasked units' normal Air Force training objectives. These two options still result in an ADAIR capacity of less than 50 percent of the Air Force-wide requirement and reduce the availability and proficiency of combat qualified pilots at a time when the Air Force is experiencing a shortfall of more than 750 CAF pilots (Venable, 2016). Furthermore, current dedicated ADAIR units in the Air Force consist of two F-16 aggressor squadrons (AGRSs) and two T-38 fighter training squadrons. The F-16 aircraft used for aggressor missions is an advanced weapons platform but there are not enough to meet the ADAIR requirements to maintain proficiency of the CAF's pilots. The T-38 is used for ADAIR but is a basic platform with no advanced electronics (radar and avionics) or weapons capabilities and does not adequately replicate realistic threat capabilities. In both the F-16 AGRS and T-38 ADAIR cases, the number of available aircraft and pilots are insufficient to meet the requirement.

As depicted on **Figure 1-1**, contract ADAIR would provide a fourth avenue to fill ADAIR sorties and improve the quality of training and readiness of CAF pilots and allow the Air Force to recapitalize other valuable assets and training time.

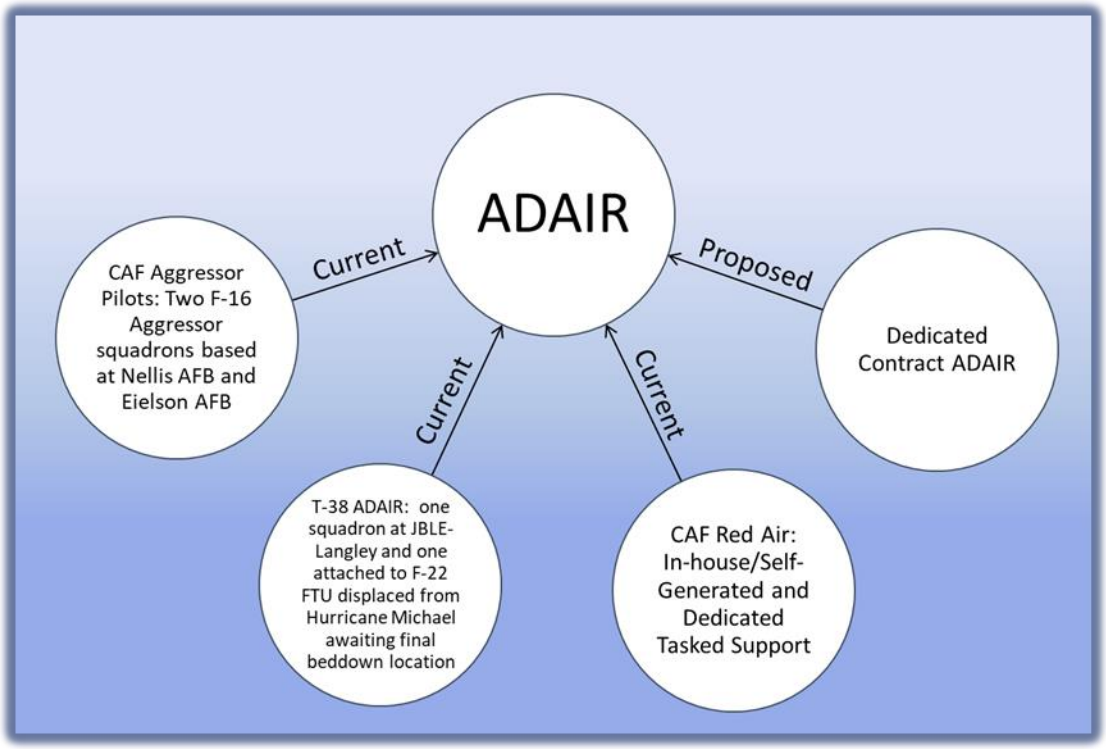


Figure 1-1. Current and Proposed Adversary Air Sortie Generation.

The contract ADAIR requirement is roughly 30,000 annual sorties. The Air Force would implement contract ADAIR in support of installations that host specific critical air-to-air training missions. Installations requiring contract ADAIR support include those bases hosting Air Force 5th generation fighter units (e.g., F-22 or F-35 aircraft), fighter FTUs, or those that support advanced fighter training. Air Force requirements for contract ADAIR exist currently at multiple installations within the continental United States and Joint Base Pearl Harbor-Hickam, Hawaii.

As discussed in **Section 1.3**, the scope of this analysis will evaluate the proposal to implement contract ADAIR at Joint Base Langley-Eustis (JBLE). Separate National Environmental Policy Act (NEPA) analyses will be completed at all locations identified by the Air Force that require contract ADAIR support and have sufficient existing facilities.

1.1.2 *Location*

During the 2005 Base Realignment and Closure Commission, Fort Eustis and Langley Air Force Base (AFB) were consolidated into one installation as JBLE (**Figure 1-2**). The former Langley AFB (JBLE-Langley) is located in Hampton, Virginia, between the Northwest and Southwest Branches of the Back River (**Figure 1-3**). JBLE-Langley would be the location supporting the Proposed Action and alternatives and, therefore, the focus of the environmental impact analyses. The former Fort Eustis (JBLE-Eustis) is located in Newport News, Virginia.

In addition to housing the 633d Air Base Wing (633 ABW), JBLE-Langley is home to the 1st Fighter Wing (1 FW), 192d Wing (192 WG) of the ANG, the 480th Intelligence Surveillance Reconnaissance Wing, the Global Cyberspace Integration Center field operating agency, and Headquarters Air Combat Command (ACC).

JBLE-Langley supports the training and operations of advanced 5th generation F-22 aircraft and hosts annual exercises with US allies to support pilot readiness.

FIFTH (5TH) GENERATION IS A TERM APPLIED TO THE NEWEST WEAPONS SYSTEMS SUCH AS THE F-22 AND F-35 FIGHTERS THAT CONTAIN NEW AND ENHANCED LEVELS OF STEALTH PROFILES, SPEED, MANEUVERABILITY, AND ADVANCED AVIONICS AND ATTACK CAPABILITIES. FOURTH (4TH) GENERATION AIRCRAFT ARE THE PREVIOUS SUITE OF FIGHTERS SUCH AS F-15, F-16, AND F/A-18.

CAF training activities utilize special use airspace proximate to JBLE-Langley. Special use airspace includes Warning Areas, which provide offshore airspace for military aircraft training and serve to warn nonparticipating aircraft of potential danger. The US Navy manages and controls W-386, W-122, and W-72 proposed for contract ADAIR use. These Warning Areas overlie the Atlantic Ocean off the coast of Virginia, Maryland, and North Carolina (**Figure 1-4**).

JBLE and the surrounding military airspace provide a critical venue to train F-22 pilots.

WARNING AREAS ARE AIRSPACE OF DEFINED DIMENSIONS THAT EXTEND FROM 3 NAUTICAL MILES OUTWARD FROM THE COAST OF THE UNITED STATES (US) AND MAY BE OVER US WATERS, INTERNATIONAL WATERS, OR BOTH. THE PURPOSE OF A WARNING AREA IS TO WARN NONPARTICIPATING PILOTS OF POTENTIALLY HAZARDOUS ACTIVITY. WARNING AREAS MAY BE USED FOR OTHER PURPOSES IF THE AREA IS RELEASED TO THE FEDERAL AVIATION ADMINISTRATION (FAA) DURING PERIODS IT IS NOT REQUIRED FOR ITS INTENDED PURPOSE AND IS WITHIN AN AREA IN WHICH THE FAA HAS AIR TRAFFIC CONTROL AUTHORITY.

1.2 PURPOSE OF THE ACTION

The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality of training and readiness of pilots of the 1 FW, 192 WG, and other units supported by JBLE-Langley. Dedicated contract ADAIR would also allow the unit to free up resources used to self-generate ADAIR and more effectively use those available flying hours. Contract ADAIR support would employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced, simulated, combat training missions. The objective of the Proposed Action at JBLE-Langley is to increase the quality of training for 5th generation F-22 fighter pilots by filling the “near peer” capacity and capability gap currently present in the 5th generation training enterprise. By augmenting JBLE-Langley’s assigned Air Force T-38 aircraft fleet with dedicated contract ADAIR capability, F-22 pilots’ existing flight hours may remain focused on the Air Force syllabus tasks, tactics, procedures, and weapons employment against a realistic adversary capability. Additionally, other Air Force (4th generation) units that may have been tasked to provide ADAIR training support at JBLE-Langley may now recapitalize valuable flying hours to focus on increasing their own levels of proficiency and readiness.

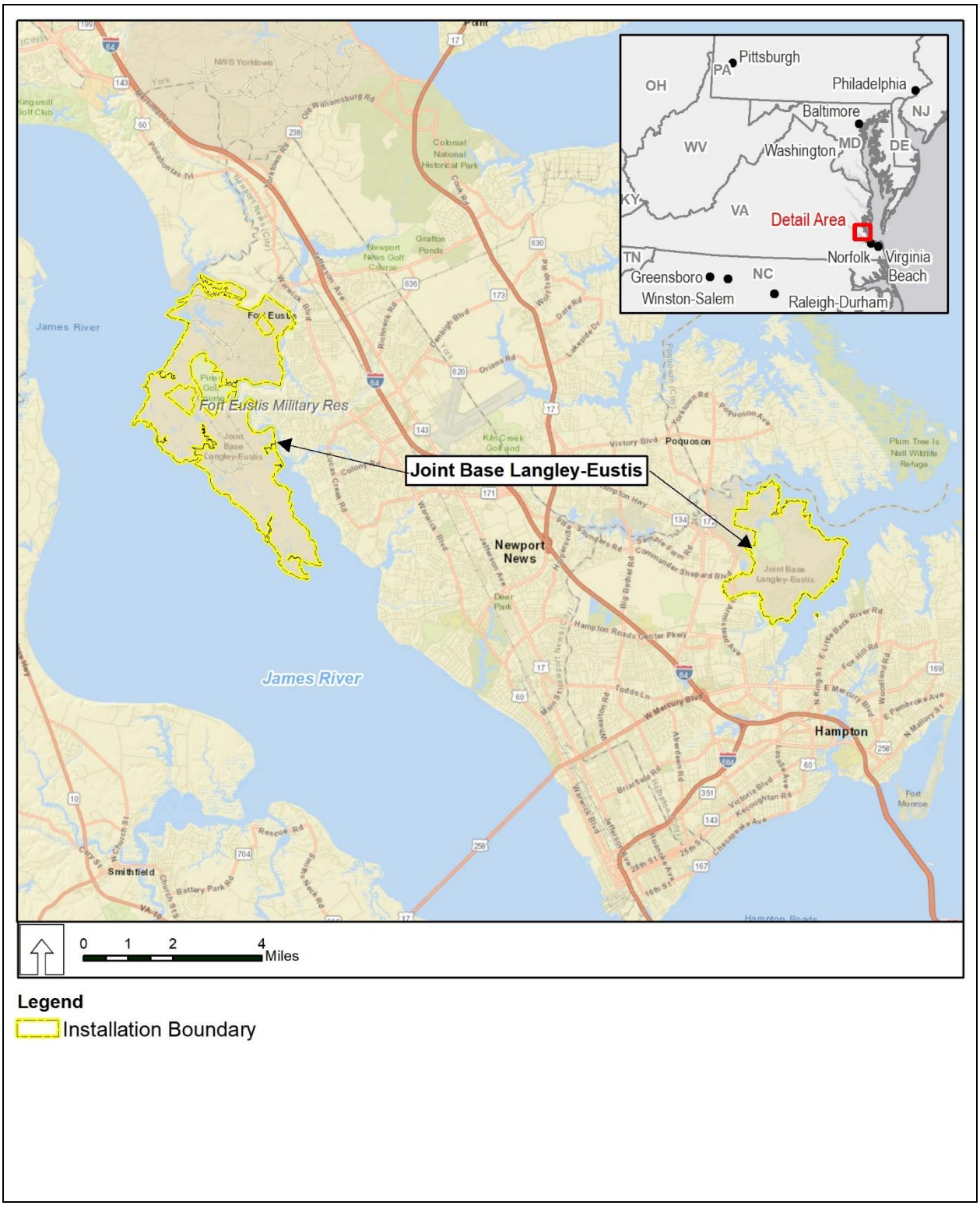


Figure 1-2. Location of Joint Base Langley-Eustis.

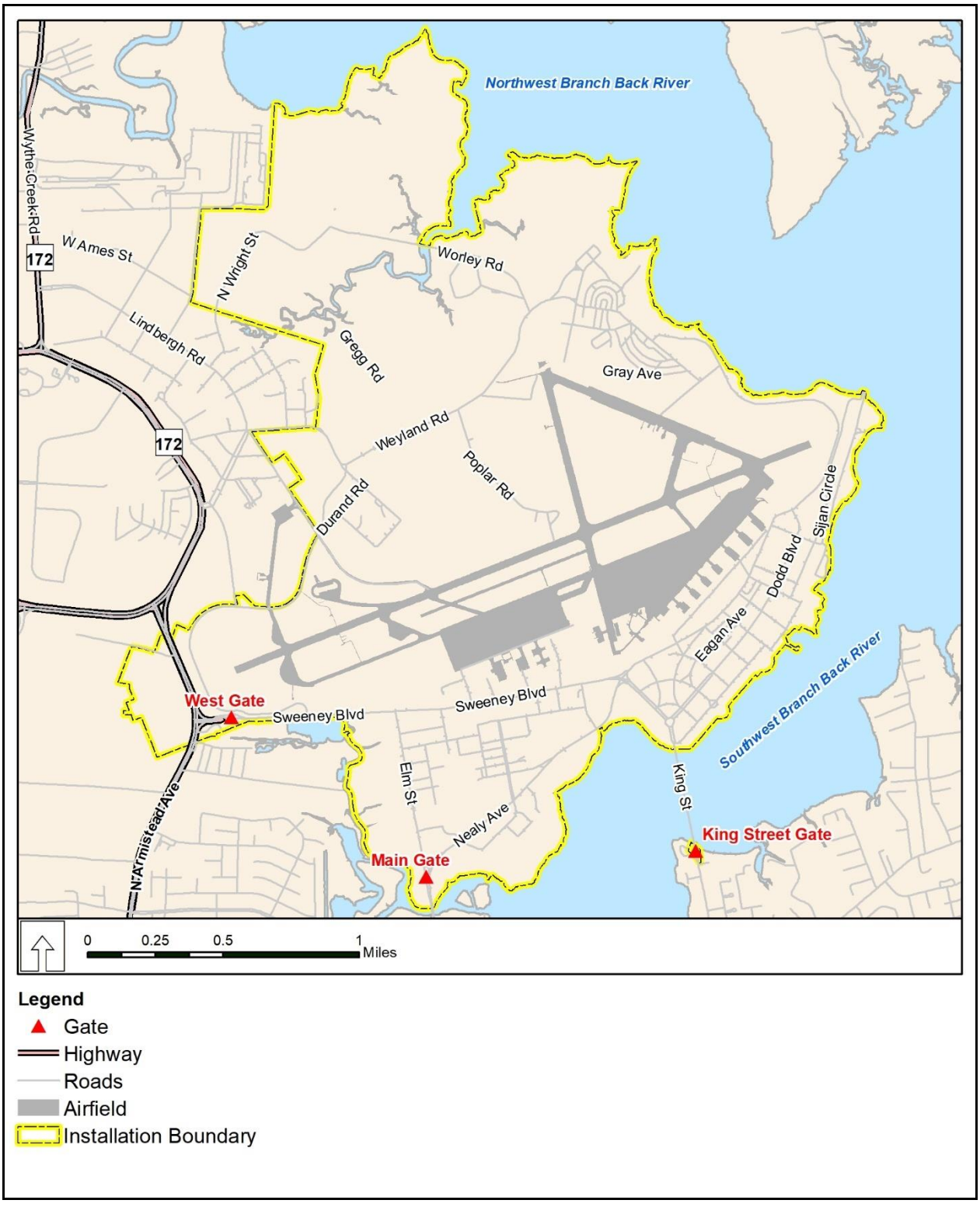


Figure 1-3. Location of Joint Base Langley-Eustis, Langley Air Force Base.

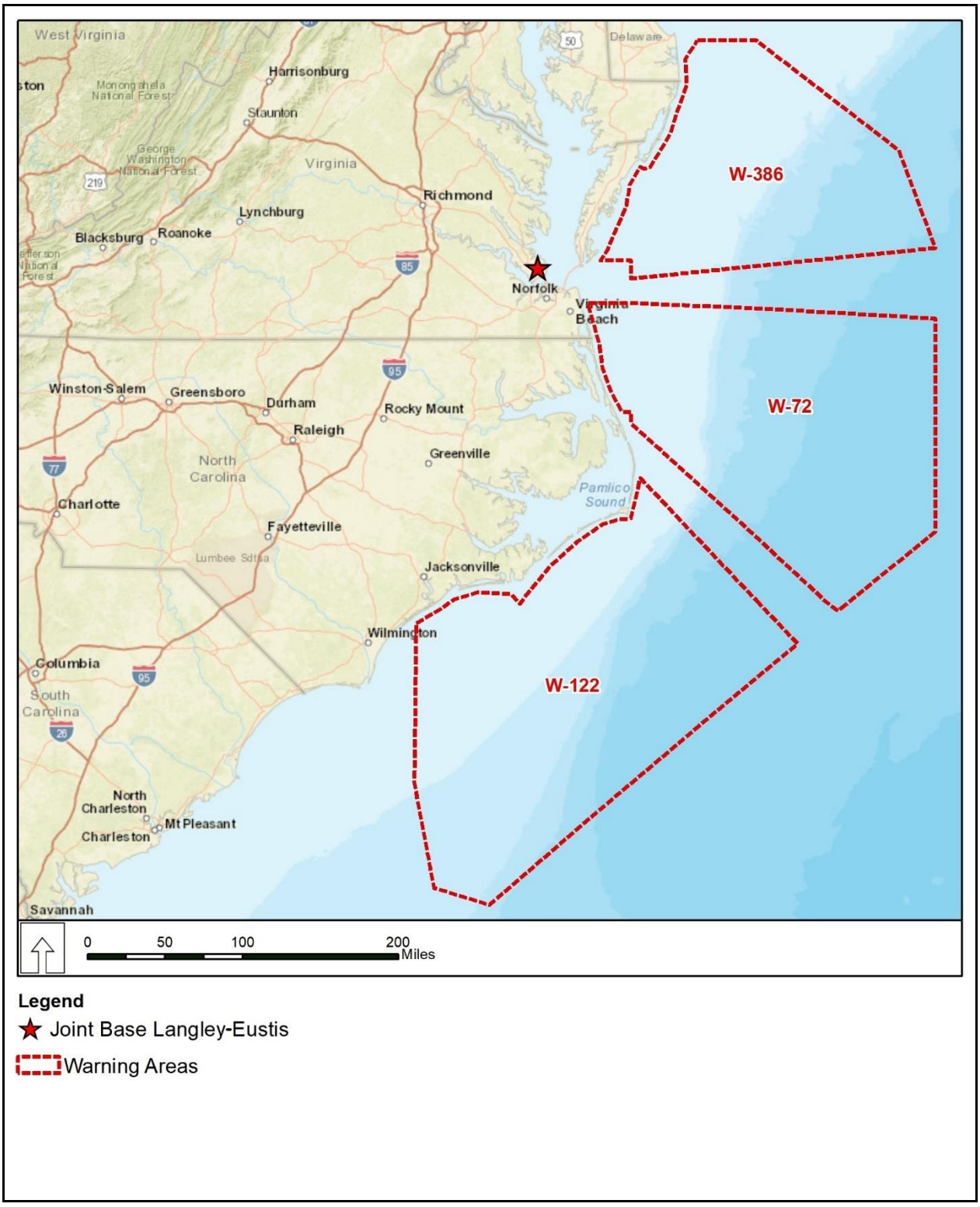


Figure 1-4. Warning Areas Proposed for Contract Adversary Air Sorties.

1.3 NEED FOR THE ACTION

The need for the action is to provide better and more realistic training for the F-22 flight training program at JBLE-Langley. Dedicated contract ADAIR is critical to improving pilot readiness as it provides realistic training opportunities to employ CAF tactics and procedures that optimize the training value of every mission. Contract ADAIR can be used in basic building block syllabus sorties or the very advanced and fluid environment of multi-aircraft air combat required by the training syllabus.

1.4 SCOPE OF THE ENVIRONMENTAL ANALYSIS

This environmental assessment (EA) analyzes the potential environmental consequences associated with establishing dedicated contract ADAIR support at JBLE-Langley. Contract ADAIR support would employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced, simulated, combat training missions in order to increase the quality of training for F-22 fighter pilots.

This EA has been prepared in accordance with the NEPA (42 U.S.C. §§ 4321 through 4347), the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500 through 1508), and 32 CFR Part 989 et seq., *Environmental Impact Analysis Process* (EIAP). NEPA ensures that environmental information, including the anticipated environmental consequences of a proposed action, is available to the public, federal and state agencies, and the decision-maker before decisions are made and before actions are taken.

Consistent with the CEQ regulations, the EA is organized into the following sections:

- Chapter 1, Purpose and Need for Action, includes an introduction, background description, location, purpose and need statement, scope of environmental analysis, decision to be made, interagency and intergovernmental coordination and consultations, applicable laws and environmental regulations, and a description of public and agency review of the EA.
- Chapter 2, Description of Proposed Action and Alternatives, includes a description of the Proposed Action, alternative selection standards, screening of alternatives, alternatives eliminated from further consideration, a description of the selected alternatives, summary of potential environmental consequences, and mitigation.
- Chapter 3, Affected Environment, includes a description of the natural and man-made environments within and surrounding JBLE-Langley and the airspace that may be affected by the Proposed Action and alternatives.
- Chapter 4, Environmental Consequences, includes definitions and discussions of direct and indirect impacts and Best Management Practices (BMPs; if applicable).
- Chapter 5, Cumulative Effects, considers the potential cumulative impacts on the environment that may result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions.
- Chapter 6, List of Preparers, provides a list of the preparers of this EA.
- Chapter 7, References, contains references for studies, data, and other resources used in the preparation of the EA.
- Appendices, as required, provide relevant correspondence, studies, modeling results, public review information, and a mitigation plan. **Appendix A** includes all interagency and intergovernmental coordination and consultations; **Appendix B** provides noise metrics and noise models; **Appendix C** outlines methodologies, emission factors, and assumptions used for air quality emission estimates for each scenario and related activities; **Appendix D** summarizes the listed species potentially occurring in the action area; and **Appendix E** outlines the mitigation and monitoring plan.

NEPA, which is implemented through the CEQ regulations, requires federal agencies to consider alternatives to the Proposed Action and to analyze potential impacts of alternative actions. Potential impacts of the Proposed Action and its alternatives described in this document will be assessed in accordance with the Air Force EIAP (32 CFR Part 989), which requires that impacts on resources be analyzed in terms of their context, duration, and intensity. To help the public and decision makers

understand the implications of impacts, they will be described in the short and long term, cumulatively, and within context. Environmental resources and the Region of Influence (ROI) analyzed in the EA are summarized in **Table 1-1**. The expected geographic scope of any potential consequences is identified as the ROI. JBLE-Langley and its environs, as well as the area within and under the proposed airspace, are considered in determining the ROI for each resource. For the airspace ROI which overlies water, land use; socioeconomics – income and employment, environmental justice, and protection of children; and hazardous materials and wastes, toxic substances, and contaminated sites are not described in baseline in **Chapter 3** or considered for detailed analysis in **Chapter 4.** These resources do not have the potential for impacts over water.

Table 1-1
Environmental Resources Analyzed in the Environmental Assessment

Resource	Region of Influence: JBLE-Langley and Environs	Region of Influence: Warning Areas (W-386, W-122, and W-72)
Airspace Management and Use	✓	✓
Noise	✓	✓
Safety	✓	✓
Air Quality	✓	✓
Biological Resources (T&E, Wetlands, Marine Resources, Coastal Zone Management Act)	✓	✓
Land Use	✓	
Socioeconomics – Income and Employment	✓	
Environmental Justice and Protection of Children	✓	
Cultural Resources (archeological, architectural, traditional)	✓	✓
Hazardous Materials and Wastes, Toxic Substances, and Contaminated Sites	✓	

Notes:
JBLE-Langley = Joint Base Langley-Eustis, Langley Air Force Base; T&E = threatened and endangered

1.4.1 *Resource Areas Eliminated from Analysis*

1.4.1.1 Infrastructure, Transportation, and Utilities

During site selection, the support for contract ADAIR operations was determined to be very good for facilities and communication infrastructure at Langley AFB. No new construction or infrastructure changes would occur under the Proposed Action. The level of service for utilities needed to support the contract personnel is assumed to be the same under all alternatives and would be adequate to support the Proposed Action. Because there would be only be an additional 109 contract personnel working at JBLE-Langley to support the contract ADAIR operations and adequate infrastructure exists on base to support these personnel and contract ADAIR aircraft operations, there would be no impacts on infrastructure at JBLE-Langley; therefore, this resource is not carried forward for further detailed analysis in this EA. Traffic counts provided by the Hampton Roads Transportation Planning Organization for local roads that access JBLE-Langley gates indicate that there is no traffic congestion during peak hour commutes on roads leading to JBLE-Langley, and that since 2011, the weekday traffic volumes along all of the roads serving JBLE-Langley gates have decreased; therefore, there would be no impacts on transportation as a result of the additional 109 contract personnel accessing JBLE-Langley under the Proposed Action.

1.4.1.2 Socioeconomics – Housing, Population, and Schools

The requirement for an estimated 109 contract personnel and their families supporting the contract ADAIR sorties in Hampton, Virginia, would have no impact on the region's population. Assuming all 109

contract personnel relocated with family members to the Hampton Roads region, this would be a negligible increase in the region's population of nearly 1.7 million people. There is adequate available housing and public schools to support the minor increase in population from the Proposed Action; therefore, there would be no impact on the region's population, housing, or schools from implementation of the Proposed Action, and these resources are not carried forward for more detailed analysis in this EA.

1.4.1.3 Soil Resources

Protection of soils was considered when evaluating potential impacts of the Proposed Action in terms of alteration of soil composition, structure, or function and any accumulation of chaff material. Effects on soils would be adverse if they alter the soil composition, structure, or function within the environment or accumulate in the soil. Under the Proposed Action, there would be no ground-disturbing activities to affect soil resources and all contract ADAIR training would occur over the Atlantic Ocean; therefore, soil resources are not carried forward for detailed analysis.

1.4.1.4 Visual Resources

There would be no potential impacts on visual resources from the proposed contract ADAIR activities because no new construction would occur, and aircraft would utilize the existing airfield. Proposed contract ADAIR activities in the areas adjacent to the proposed facilities and aircraft parking ramp would not change the existing visual setting. Likewise, the Proposed Action would not affect the aesthetic qualities of the Atlantic Ocean beneath the Warning Areas. As such, visual resources are not carried forward for further detailed analysis in this EA.

1.4.1.5 Water Resources

Under the Proposed Action, there would be no ground-disturbing activities. The proposed additional contract ADAIR aircraft and personnel and associated operational and maintenance activities would not affect water quality or quantity. Under the airspace, the use of defensive countermeasures has been found to be nontoxic. Due to the rare and infrequent nature of fuel dumps as well as in-place safety precautions such as altitude restrictions, these emergency procedures are not likely to adversely affect water resources; therefore, water resources are not carried forward for detailed analysis.

1.5 DECISION TO BE MADE

This EA evaluates the potential environmental consequences of implementing the Proposed or alternative actions to provide dedicated contract ADAIR sorties at JBLE-Langley to improve the readiness and proficiency of pilots of the 1 FW, 192 WG, other supported units, and the CAF at large. Based on the analysis in this EA, the CAF will make one of three decisions regarding the Proposed Action: 1) choose the alternative action that best meets the purpose of and need for this project and sign a Finding of No Significant Impact (FONSI), allowing implementation of the selected alternative; 2) initiate preparation of an Environmental Impact Statement (EIS) if it is determined that significant impacts would occur through implementation of the Proposed or alternative actions; or 3) select the No Action Alternative, whereby the Proposed Action would not be implemented. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project and be available to inform decision-makers of the potential environmental impacts.

1.6 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

1.6.1 *Interagency/Intergovernmental Coordination and Consultation*

The environmental analysis process, in compliance with NEPA guidance, includes public and agency review of information pertinent to the Proposed and alternative actions. Scoping is an early and open process for developing the breadth of issues to be addressed in an EA and for identifying significant concerns related to an action. Per the requirements of EO 12372, *Intergovernmental Review of Federal*

Programs, as amended by EO 12416, federal, state, and local agencies with jurisdiction that could potentially be affected by the Proposed and alternative actions were notified during the development of this EA. Those Interagency and Intergovernmental Coordination for Environmental Planning letters and responses are included in **Appendix A**.

1.6.2 *Agency Consultations*

Implementation of the Proposed Action involves coordination with several organizations and agencies. Compliance with Section 7 of the Endangered Species Act (ESA), and implementing regulations (50 CFR Part 402), requires communication with the US Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. The primary focus of this consultation is to request a determination of whether any of these species occur in the proposal area. If any of these species is present, a determination would be made of any potential adverse effects on the species. Should no species protected by the ESA be affected by the Proposed or alternative actions, no additional consultation is required. Letters were sent to the appropriate USFWS and NMFS offices as well as relevant state agencies informing them of the proposal and requesting data regarding applicable protected species. Subsequently, the Air Force received the USFWS Virginia Field Office's self-certification letter with a no effect determination on any federally listed species under USFWS jurisdiction (**Appendix A**). Further, concurrence with the Air Force's determination of not likely to adversely affect any ESA-listed species under NMFS jurisdiction was received from NMFS (**Appendix A**). In addition, the Marine Mammal Protection Act (MMPA; 16 U.S.C. § 1371 et seq.) makes it illegal for a person to take a marine mammal, which includes significantly disturbing the habitat, unless it is done in accordance with regulations or a permit. The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801) requires federal agencies to consult with the NMFS when activities may have adverse impacts on designated essential fish habitat.

Coordination with the Virginia Department of Environmental Quality (VDEQ), Office of Environmental Impact Review occurred for review and comment. The staff of the Office of Environmental Review distributes documents to appropriate state agencies, planning districts, and localities for review and comment and prepares a combined state response. Compliance with Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations (36 CFR Part 800) was accomplished by consultation with State Historic Preservation Officer through the VDEQ Office of Environmental Impact Review on the Air Force's no historic properties affected determination. Similarly, the appropriate air and water quality and wildlife agencies were included in this coordination. Comment letters on the Draft EA were received and addressed in this EA. Copies of those letters are included in **Appendix A**. A coastal zone consistency determination under the Coastal Zone Management Program was submitted to VDEQ and is included in **Appendix F**.

All agency correspondence is included in **Appendix A**.

1.6.3 *Government to Government Consultation*

The NHPA and its regulations in 36 CFR Part 800 direct federal agencies to consult with federally recognized Indian tribes when a proposed or alternative action has the potential to affect tribal lands or properties of religious and cultural significance to a tribe. Consistent with the NHPA, Department of Defense (DOD) Instruction 4710.02, *Interactions with Federally-Recognized Tribes*, and Air Force Instruction (AFI) 90-2002, *Air Force Interaction with Federally-Recognized Tribes*, federally recognized tribes that are historically affiliated with lands in the vicinity of the Proposed and alternative actions have been invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation or the interagency coordination process, and it requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The JBLE point of contact for Native American tribes is the Joint Base Commander. The JBLE point of contact for consultation with the Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation

is the JBLE Cultural Resources Manager. Government-to-government consultation is included in **Appendix A.**

1.7 APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS

Implementation of the Proposed Action would involve coordination with several organizations and agencies. Adherence to the requirements of specific laws, regulations, BMPs, and necessary permits are described in detail in each resource section in **Chapter 3**.

1.7.1 *National Environmental Policy Act*

NEPA requires that federal agencies consider potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed federal decisions. The CEQ was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to this process. In 1978, the CEQ issued Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500-1508 [CEQ 1978]). These regulations specify that an EA be prepared to

- briefly provide sufficient analysis and evidence for determining whether to prepare an EIS or a FONSI;
- aid in an agency's compliance with NEPA when no EIS is necessary; and
- facilitate preparation of an EIS when one is necessary.

Further, to comply with other relevant environmental requirements (e.g., the ESA and NHPA) in addition to NEPA and to assess potential environmental impacts, the EIAP and decision-making process for the Proposed and alternative actions involves a thorough examination of environmental issues potentially affected by government actions subject to NEPA.

1.7.2 *The Environmental Impact Analysis Process*

The EIAP is the process by which the Air Force facilitates compliance with environmental regulations (32 CFR Part 989), including NEPA, which is primary legislation affecting the agency's decision-making process.

1.8 PUBLIC AND AGENCY REVIEW OF ENVIRONMENTAL ASSESSMENT

A Notice of Availability (NOA) of the Draft EA and FONSI was published on 14 July 2019 in *The Daily Press*, Newport News, Virginia, inviting the public to review and comment on the Draft EA. The public and agency review ended on 14 August 2019. No public comments were received. The agency comments are provided in **Appendix A**.

Copies of the Draft EA and FONSI were also made available for review at the following locations and on the JBLE-Langley Environmental website at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/:

- Bateman Library, 42 Ash Avenue, Building 161, JBLE-Langley, Virginia 23665
- Hampton Library, 4207 Victoria Boulevard, Hampton, Virginia 23669
- Poquoson Library, 500 City Hall Avenue, Poquoson, Virginia 23662

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CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Air Force is proposing to provide dedicated contract ADAIR sorties for CAF training at JBLE-Langley, Virginia, to address shortfalls in F-22 pilot training and production capability and provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced combat training missions. Training scenarios would include the use of combat tactics and procedures that differ from CAF tactics to simulate an opposing force. The Proposed Action includes elements affecting the base and military training airspace. The elements affecting the base include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the airspace include airspace use and defensive countermeasures.

Numbers of contract ADAIR aircraft, maintenance personnel, and pilots were estimated and informed through multiple meetings with active duty and civilian Air Force functional area experts and were based on sortie requirements developed by the end user at the base. Numbers of aircraft and personnel were then used to define facility requirements, which were estimated using planning factors from Air Force Manual 32-1084, *Facility Requirements*.

2.1.1 *Contract Adversary Air Aircraft*

Contract ADAIR would have multiple aircraft available with acceptable capabilities to support training requirements. Contract ADAIR proposed aircraft specifications are described in **Table 2-1**; all aircraft listed are capable of providing contract ADAIR support to F-22 CAF aircrews stationed at JBLE-Langley. One or a combination of these aircraft types may be operated by a contractor at JBLE-Langley in support of contract ADAIR training. The Proposed Action at JBLE-Langley would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 aircraft.

Table 2-1
Contract Adversary Air Potential Aircraft Specifications

Aircraft	Wingspan (feet)	Length (feet)	Height (feet)	Number of Engines
MiG-29	38	57	16	2
F-5	27	48	14	2
Dassault Mirage	27	51	15	1
F-16	33	50	17	1
Eurofighter Typhoon	35	48	13	2
JAS-39 Gripen	27	47	16	1

2.1.2 *Facilities*

JBLE-Langley has existing facilities to support the Proposed Action. The proposed facilities are available for use and require minimal modification. They are located around the existing airfield and runway and include the necessary ramp space; maintenance space; operational space; petroleum, oil, and lubricants storage; runway access; and associated parking to support the contract ADAIR mission. In addition, the Munitions Storage Area has sufficient facilities to store the necessary increase in training countermeasure allocations (chaff/flares; discussed further in **Section 2.1.7**). A summary of estimated facilities requirements needed to satisfy the Proposed Action is provided in **Table 2-2**.

Table 2-2
Joint Base Langley-Eustis, Langley Air Force Base Facilities Requirements

Ramp Required (yd^2)	Number Maintenance Personnel[1]	Number Pilots[1]	Aircraft Maintenance Unit space (ft^2)	Stand-Alone Operations Space (ft^2)	Integrated Operations Space (ft^2)
9,800	91	18	3,400	2,100	1,300

Notes:
[1] The number of personnel is estimated, and the final number may be slightly higher or lower depending on operational needs.
ft^2 = square feet; yd^2 = square yards

JBLE-Langley has two options for providing proposed operations facilities which include operations and aircraft maintenance functions. Contract operations space may either be consolidated in Building 790, or a stand-alone operations facility located in Building 751 with some modification (**Figure 2-1**). JBLE-Langley could integrate contract ADAIR operations space requirements with the existing T-38 ADAIR mission by providing 1,300 square feet (ft^2) of operational space in Building 790, which would be available. Alternatively, 1,214 ft^2 would be available in Building 751, but this building does not have aircrew flight equipment or secured storage space. This would need to be added through minor renovations to the building to meet the proposed contract ADAIR mission requirements.

THE AIRCRAFT MAINTENANCE UNIT (AMU) IS THE SUPPORT FUNCTION RESPONSIBLE FOR THE DIRECT SUPPORT AND MAINTENANCE OF AIRCRAFT TO ENSURE THEY ARE MISSION CAPABLE. AMU SPACE INCLUDES DEDICATED FACILITIES FOR CONTRACT MAINTENANCE PERSONNEL AND OFFICE AND ADMINISTRATIVE SPACE, PLUS SPECIAL USE SPACE FOR A TOOL CRIB, PARTS STORAGE, AND SECURE STORAGE. THE CONTRACT ADVERSARY AIR (ADAIR) AMU IS INTENDED, FOR ACCOUNTABILITY PURPOSES, TO REMAIN PHYSICALLY SEPARATED FROM ANY AIR FORCE MAINTENANCE ORGANIZATION. CONVERSELY, CONTRACT ADAIR OPERATIONS SPACE MAY, AT THE DISCRETION OF THE HOST UNIT, BE A SEPARATE STAND-ALONE FACILITY OR BE INTEGRATED INTO AN EXISTING AIR FORCE OPERATIONS FACILITY. STAND-ALONE OPERATIONS SPACE INCLUDES OFFICE AND ADMINISTRATIVE SPACE, PLUS SPECIAL USE SPACE FOR AIRCREW FLIGHT EQUIPMENT, MISSION PLANNING, AND SECURE STORAGE. INTEGRATED OPERATIONS SPACE INCLUDES REDUCED AMOUNTS OF OFFICE, ADMINISTRATIVE, AND SPECIAL USE SPACE BECAUSE OF ANTICIPATED ECONOMIES OF SCALE REALIZED WHEN FACILITIES ARE SHARED WITH ANOTHER ORGANIZATION.

Aircraft Maintenance Unit (AMU) activities are proposed to occur out of Building 751 (**Figure 2-1**). It would be expected that 46,900 square yards of aircraft parking space would be available on the East Ramp adjacent to Building 751 (**Figure 2-2**). If contract ADAIR operational facilities were combined in Building 790 with the T-38 ADAIR pilot operational facilities, the AMU and hangar would still be located at Building 751.

Following training sorties, contract ADAIR pilots would land and park their aircraft at JBLE-Langley on the ramp area adjacent to Building 751. Pilots would then participate in debriefs with Air Force pilots of the 1 FW, 192 WG of the ANG, and other units as required. Debriefs would occur at facilities on JBLE-Langley.

Contract ADAIR aircraft would use Defense Logistics Agencies (DLA) Jet A aircraft fuel that would be delivered in fuel trucks owned and operated by the 733d Logistics Readiness Squadron (733 LRS). Contract ADAIR personnel would be responsible for all aircraft fuel and defuel operations. No additional personnel in the 733 LRS would be needed to support the additional deliveries.

Contract ADAIR aircraft would also use Air Force chaff and flares (also refer to **Section 2.1.7** for additional information on defensive countermeasures). The ADAIR contractor would receive an allocation for chaff and flares through the 1st Maintenance Squadron (1 MXS)/192d Maintenance Squadron (192 MXS), Munitions Flights. Munitions personnel would store, account for, inspect, maintain, assemble, and deliver chaff and flares to contract ADAIR aircraft; contract personnel would be responsible for loading and unloading chaff and flares on aircraft. In addition, some minor support for egress system munitions (i.e., cartridge-actuated devices [CAD]/propellant-actuated devices [PAD]) may be necessary; however, the level of support is expected to be minor and infrequent.

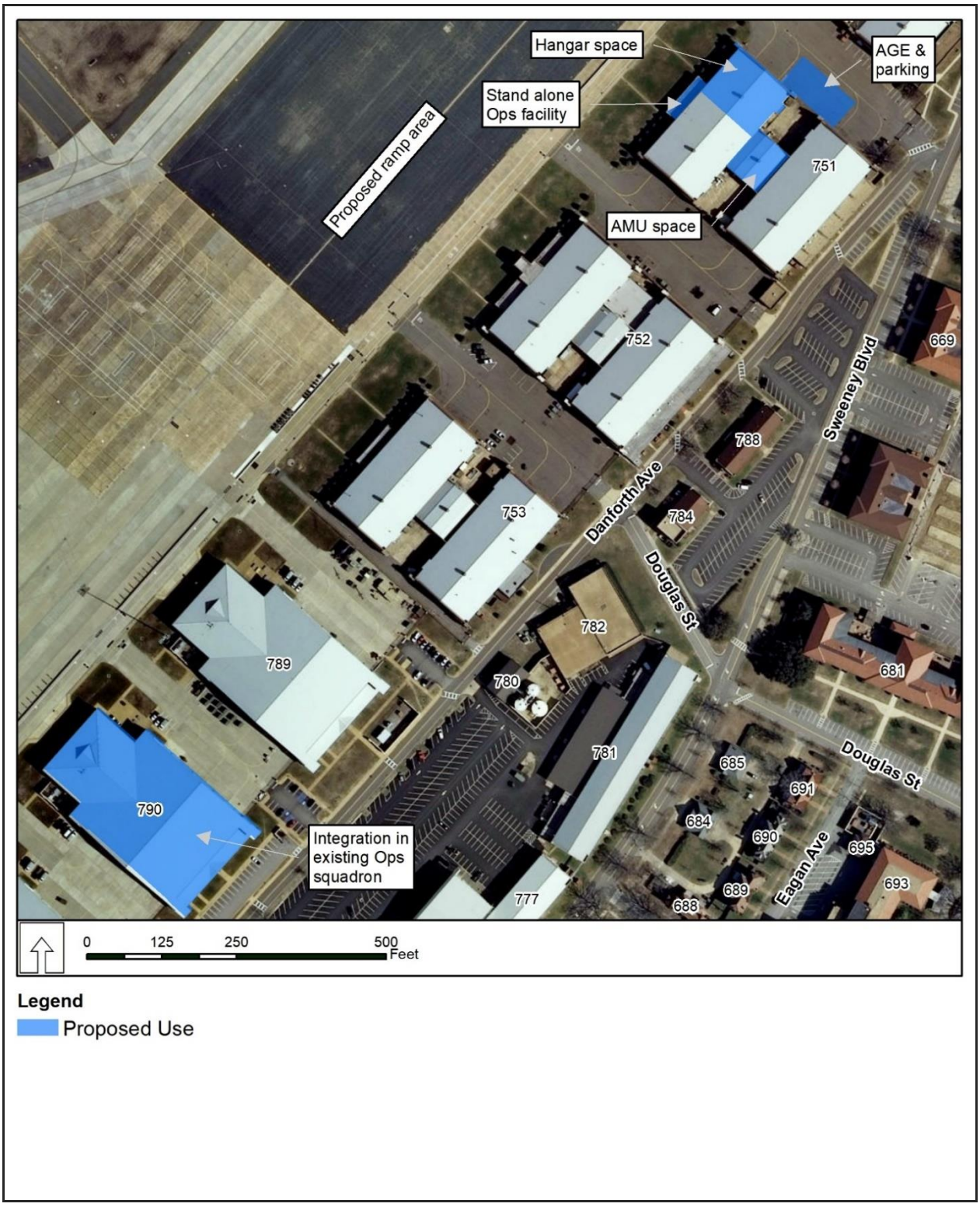


Figure 2-1. Proposed Location for Combined Aircraft Maintenance Unit, Operations, and Hangar Space at Existing Buildings 751 and 790.

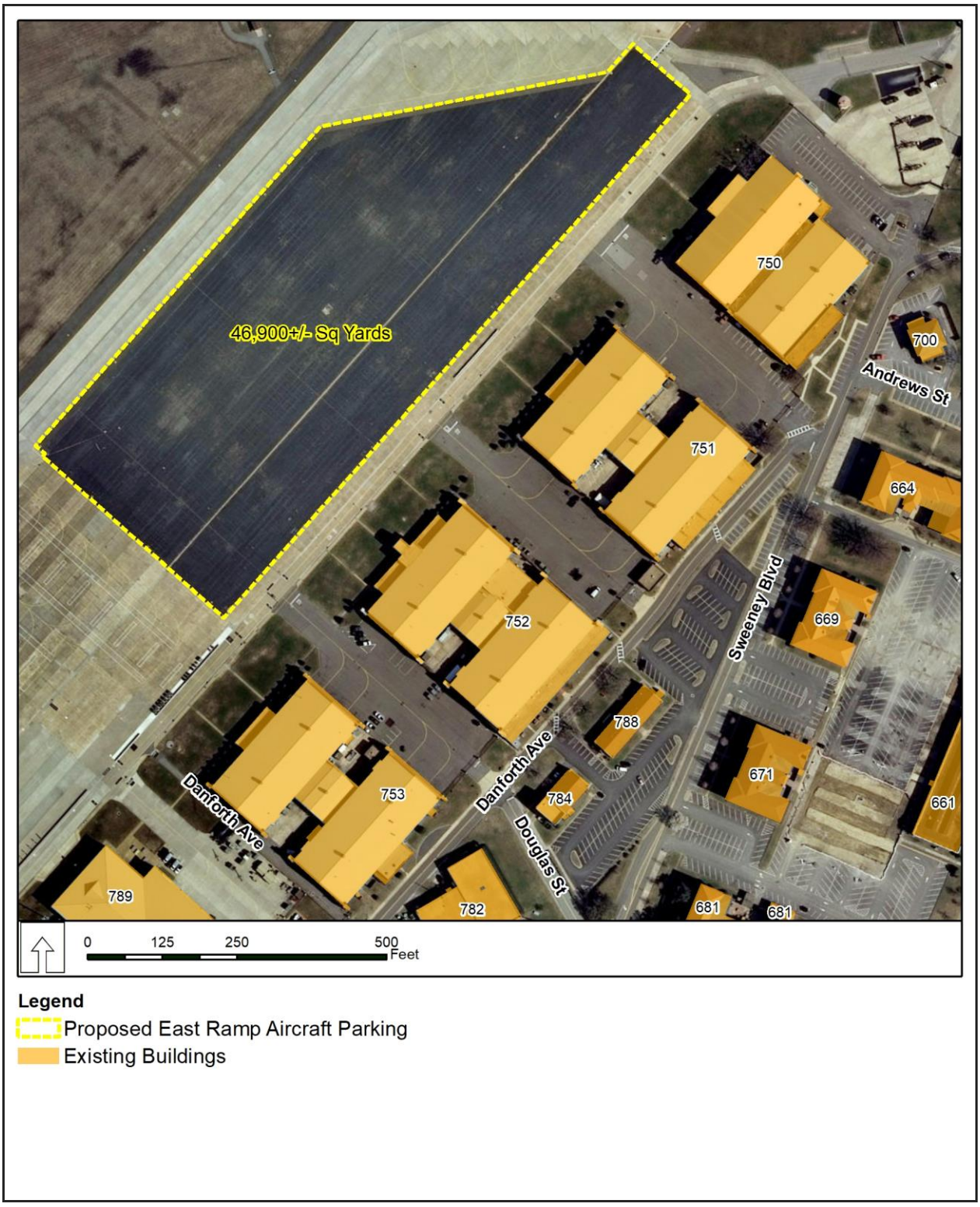


Figure 2-2. Proposed Location for Ramp Space for Contract Adversary Air Aircraft Parking.

The additional munitions functions would not require additional munitions personnel. Contractor maintenance personnel would be responsible for the inspection and maintenance of all external stores (e.g., captive air training missiles, electronic countermeasure pods, external fuel tanks). The ejector cartridges required for external stores would be considered as contractor-furnished equipment and would not require support from the base Munitions Flight. All required Aerospace Ground Equipment (AGE) would be owned and maintained by the contract ADAIR. Gas and diesel fuel for AGE would be obtained by contract ADAIR personnel from the base DLA fuel station through an account established with 733 LRS.

AEROSPACE GROUND EQUIPMENT IS SUPPORT EQUIPMENT REQUIRED FOR AIRCRAFT MAINTENANCE AND SORTIE GENERATION AND IS COMPOSED OF EQUIPMENT SUCH AS GENERATORS, AIR COMPRESSORS, PORTABLE LIGHT SOURCES, TOW BARS, AND MOBILE LIQUID OXYGEN AND

2.1.3 *Maintenance*

As discussed above, under Options 1 and 2, maintenance would use hangar space and AMU facilities in Building 751 to perform limited maintenance operations on contract ADAIR aircraft. Contract ADAIR aircraft maintenance would include routine inspections and minor unscheduled repairs on the flightline. Aircraft requiring major scheduled (depot level maintenance) or unscheduled maintenance would be expected to be flown back to the contractor's home base for repairs. For the rare occasions when an aircraft is not flyable, the contractor would dispatch a temporary field repair team to JBLE-Langley to repair the aircraft. Any additional maintenance support requirements (e.g., aircraft fuel cell, defueling, aircraft structural assets, nondestructive inspection Joint Oil Analysis Program tests) would be coordinated with 1 MXS/192 MXS, 733 LRS, or 1st Aircraft Maintenance Squadron/192d Aircraft Maintenance Squadron, as appropriate on a noninterference basis.

2.1.4 *Personnel*

Contract ADAIR at JBLE-Langley would be staffed by an estimated 91 additional contracted maintenance personnel who would primarily operate out of Building 751. Implementation of the Proposed Action would also employ an estimated 18 contracted pilots to primarily operate out of Building 751 yet may also use Building 790 for mission planning briefs and post-mission debriefs, as well as other contract ADAIR associated activities. It is expected that the initial personnel would arrive about 90 days after a contractor is selected; the estimated arrival on JBLE-Langley is between February 2020 and January 2021.

2.1.5 *Sorties*

The Proposed Action would contract for an estimated 14 contractor aircraft to fly an estimated 4,100 annual sorties in support of the 1 FW, 192 WG, and other units supported by JBLE-Langley. This number of sorties includes sorties expected for contractor training activities (refer to **Section 2.1.6**) and aircraft leaving for or returning from either maintenance or other deployments.

Air Force convention is to describe daily flying schedules in terms of total sorties and a "flight turn pattern." A flight turn pattern allows the CAF to fly available aircraft multiple times per day to maximize available flying opportunities for assigned pilots. Flight turn patterns are designed to allow aircraft to fly, land, complete appropriate post flight inspections, refuel, and fly again. The maximum flight turn pattern that would be flown by contract ADAIR support would be an 8 x 8 x 8.

A TURN PATTERN OF 8 X 8 X 8 DOES NOT REQUIRE 24 AIRCRAFT TO EXECUTE BUT RATHER COULD BE FILLED WITH ONLY EIGHT AIRCRAFT (NOTWITHSTANDING IMPACTS OF BROKEN AIRCRAFT AND AIRSPACE SCHEDULES). THE TURN PATTERN AND TOTAL DAILY SORTIES ARE THE SAME FOR ENVIRONMENTAL PURPOSES, BECAUSE THEY BOTH INDICATE THE NUMBER OF TAKEOFFS AND LANDINGS FOR ANY GIVEN DAY. AN 8 X 8 X 8 REPRESENTS 24 TOTAL SORTIES FOR THE DAY EVEN THOUGH THOSE SORTIES MAY HAVE BEEN FLOWN WITH ONLY 8 TOTAL AIRCRAFT.

Contract ADAIR pilots may fly very few additional traffic patterns at JBLE-Langley to maintain their currency and proficiency as required. Additional traffic patterns would be anticipated on no more than 5 percent of the annual sortie total, about 184 sorties.

Implementation of the Proposed Action would result in an increase of 25 percent in the number of operations at JBLE-Langley. Refer to **Section 2.1.6** for more information on training operations. Contract ADAIR would fly up to a projected 3 percent of the

estimated 4,100 sorties during environmental night hours when the effects of aircraft noise are accentuated (10:00 pm to 7:00 am local time; refer to Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*). This would increase flights at night by approximately 123 field operations per year, an increase of 97 percent of existing night sorties. Contractor night sorties would be flown during the Wing's approved flying window.

2.1.6 *Airspace Use*

ABOVE GROUND LEVEL (AGL) IS ALTITUDE EXPRESSED IN FEET MEASURED ABOVE THE SURFACE OF THE GROUND. ALTITUDES ARE REFERRED TO AS MEAN SEA LEVEL (MSL) WHEN FLYING ABOVE WATER, WHILE FLYING OVER LAND BOTH MSL AND AGL ARE USED TO DELINEATE AIRSPACE STRUCTURE. FLIGHT LEVEL (FL) IS VERTICAL ALTITUDE EXPRESSED IN HUNDREDS OF FEET.

The locations of the airspace that would be used for contract ADAIR are depicted on **Figure 1-4** (**Section 1.1.2**). Current and projected annual contract ADAIR training activities in the airspace are estimated to be 4,000 sorties and are summarized in **Table 2-3**. Proposed contract ADAIR sorties would generally consist of the following five steps: depart from JBLE-Langley runway, transit from JBLE-Langley airfield to airspace, perform ADAIR training, transit back to JBLE-Langley, and land at JBLE-Langley. Contract ADAIR aircraft would spend 5 to 10 minutes in transit each way between the airfield and airspace. Time spent within the airspace (W-386, W-72, and W-122) would depend upon the specific training mission performed but would typically last 45 to 60 minutes. Contractor operations would occur in these Warning Areas concurrent to the 1 FW and 192 WG or other supported Air Force units. Supersonic operations are allowed in all three Warning Areas. No airspace modifications would be required for contract ADAIR as part of the Proposed Action.

Table 2-3
Current and Projected Annual Training Activities by Joint Base Langley-Eustis, Langley Air Force Base

Airspace	Current Altitude[1]	Baseline Training Sorties	Projected Contract ADAIR Training Sorties	Projected Total Sorties
W-386	Surface to Unlimited (primarily 500 ft MSL to FL340)	9,536	3,600	13,136
W-122	Surface to Unlimited (primarily 500 ft MSL to FL340)	532	200	732
W-72	Surface to Unlimited (primarily 500 ft MSL to FL340)	532	200	732
Total Proposed Airspace Sorties		**10,600**	**4,000[2]**	**14,600**

Notes:
[1] No change to current minimum flight altitude is proposed.
[2] A total of 100 of the 4,100 contractor sorties would not be traveling from Joint Base Langley-Eustis, Langley Air Force Base to the airspace – they would return to contractor's base for maintenance or pilot proficiency training.

ADAIR = adversary air; FL = flight level (vertical altitude expressed in hundreds of feet); ft = feet; MSL = mean sea level

2.1.7 *Defensive Countermeasures*

While contract ADAIR aircraft would not carry or employ live or inert munitions, aircraft would operate with advanced radar and electronic targeting systems during engagements. Contract ADAIR aircraft would employ chaff and flares (e.g., RR-188 chaff and M206 flares or similar) during 100 percent of their training sortie operations. Chaff and flares are the principal defensive countermeasures dispensed by military aircraft to avoid detection or attack by enemy air defense systems.

Chaff is an electronic countermeasure designed to reflect radar waves and obscure aircraft, ships, and other equipment from radar tracking sources. Chaff bundles consist of millions of nonhazardous aluminum-coated glass fibers. When ejected from the aircraft, these fibers disperse widely in the air, forming an electromagnetic screen that temporarily hides the aircraft from radar and forms a radar decoy, allowing the aircraft to defensively maneuver or leave the area. Flares are magnesium pellets ejected from military aircraft and provide high-temperature heat sources that act as decoys for heat-seeking weapons targeting the aircraft. These defensive countermeasures are utilized to keep aircraft from being successfully targeted by or escape from weapons such as surface-to-air missiles, air-to-air missiles, antiaircraft artillery, and, in the case of the Proposed Action, other aircraft.

The existing and estimated additional chaff and flare use are presented in **Table 2-4**. Frequent training in use of chaff and flares by aircrews to master the timing of deployment and the capabilities of the devices is a critical component of ADAIR training. Chaff and flares (types similar to RR-188 chaff and M206 flares) are proposed for annual use in contract ADAIR training. While 100 percent of the requirement may not be allocated or expended, this amount is carried forward to determine potential impact associated with defensive countermeasures. Chaff and flares can be dispensed in the offshore Warning Areas without altitude restrictions (Air Force, 2001).

Table 2-4
Existing and Proposed Defensive Countermeasure Use

Special Use Airspace	Countermeasure Type	Current Baseline Use[1]	Total Estimated Future Use[2]
Warning Area W-386	Chaff Bundles	11,191	18,796
	Flares	17,883	30,037
Warning Areas W-122 and W-72	Chaff Bundles	1,243	2,088
	Flares	1,987	3,337

Notes:
1. Baseline countermeasure use is based on the current FY18 use, the estimated increase from the 2019 increase to the Primary Aircraft Assigned, and includes chaff and flares used by CAF self-generated Red Air support.
2 This reflects Contract ADAIR estimated countermeasure use added to the baseline use. With the addition of Contract ADAIR, there would be an estimated 25 percent savings in the amount of chaff and flares used by the CAF due to no longer being tasked to fly CAF self-generated Red Air support.

ADAIR = adversary air; CAF = Combat Air Forces

2.2 SELECTION STANDARDS

In order to assess viable alternatives for the contract ADAIR implementation at JBLE-Langley, the following selection standards were applied:

1. Mission: In addition to supporting AF-prioritized missions as described in **Section 1.1.1**, contract ADAIR alternatives must not displace, interfere with, detract from, or reduce other Air Force missions or combat operations worldwide.
2. Airspace Capacity: Alternatives must have the airspace capacity to support force-on-force training engagements and must be able to safely support the additional contract ADAIR sorties in the airspace. Airspace must be large enough to effectively support realistic air-to-air training. Viable alternatives should not require establishing new military airspace but should occur within existing surrounding military airspace.
3. Facilities: Alternatives must leverage existing facilities that support the contract ADAIR requirements with minimal short duration, low-cost renovations, if any are needed. Alternatives must have existing
    a. operations work/office space;
    b. aircraft parking and hangar space;

c. maintenance work/office space;
d. munitions storage space;
e. fuel storage capacity and delivery capability; and
f. a runway of sufficient length for takeoff and landing of applicable aircraft, with appropriate safety features, infrastructure, and clear zones (CZs) to ensure safe operations.

4. Cost and Time: Contract ADAIR locations would need to support costs of facilities renovations from within their existing Operations and Maintenance budgets. Viable alternatives must not require major renovations or funding to implement. Furthermore, as CAF pilot readiness is currently an urgent need, viable ADAIR alternatives must be able to support ADAIR activities in the near-term. Solutions that cannot be implemented within the next 2 years, therefore, do not meet the purpose and need for the initiative.

2.3 SCREENING OF ALTERNATIVES

The following potential alternatives were considered:

- Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley for support in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.
- Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley for support in W-386, W-122, and W-72, operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790.
- Alternative 3 – Establish an additional Air Force AGRS of military pilots to fly CAF ADAIR aircraft (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley for support in W-386, W-122, and W-72.
- Alternative 4 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley for support in W-386, W-122, and W-72, constructing new hangars and operations and maintenance facilities.
- Alternative 5 – Establish dedicated CAF ADAIR by tasking organic Air Force units to provide the capability.

The selection standards described in **Section 2.2** were applied to these alternatives to determine which could support contract ADAIR requirements and fulfill the purpose and need for the Proposed Action. The five alternatives considered above are compared in **Table 2-5** (**Comparison of Alternatives**).

2.4 ALTERNATIVE ACTIONS ELIMINATED FROM FURTHER CONSIDERATION

Three alternatives were considered and eliminated from further consideration because they would not meet the purpose and need for the action or the selection standards (refer to **Section 2.3**). These alternatives included the following:

- Alternative 3: Establish an additional Air Force AGRS of military pilots to fly CAF ADAIR aircraft (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley. Establishing a new Air Force AGRS of 4th generation aircraft would meet many of the selection standards; however, it would take a large amount of time to implement. It takes more than a decade to train an Air Force pilot. Establishing another organic AGRS would require intensive planning, budgeting, and training of Air Force pilots before they would be ready to execute their mission. Rapid stand-up and manning of additional AGRS squadrons would be possible but not without reducing both manpower and combat platforms available to support combat operations. Due to the timeframe and/or reductions in combat mission capacity involved, this alternative fails to meet Selection Standards 1 and 4 and does not meet the purpose and need for the Proposed Action.
- Alternative 4: Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley constructing new hangars and operations and maintenance facilities. Establishing the contract ADAIR mission with new facilities construction was considered but not carried forward, as the alternative requires the construction of new

facilities and does not provide support in the timely manner needed to address the pilot readiness crisis, and as such does not meet Selection Standards 3 and 4. It would take 4 to 5 years to plan, program, budget, appropriate, design, and construct new facilities. This would not support the purpose and need for the Proposed Action.

- Alternative 5: Establish dedicated CAF ADAIR by tasking organic CAF units to provide the capability. Tasking organic 4th generation assets to provide dedicated ADAIR support to JBLE-Langley would result in both a reduction of combat power applied worldwide as well as continued degradation of the unit's own readiness. The units employing 4th generation aircraft, such as the F-16, are heavily engaged in deployments and overseas missions. Under this alternative, these units would continue to struggle with providing for their own proficiency, while maintaining support for both combat operations and CAF ADAIR. Such an alternative does not meet Selection Standard 1 or the overarching purpose and need for the Proposed Action.

Table 2-5
Comparison of Alternatives

Alternative Actions	Selection Standard				Meets Purpose and Need
	1. Mission	2. Airspace	3. Facilities	4. Cost and Time	
Alternative 1	Yes	Yes	Yes	Yes	**YES**
Alternative 2	Yes	Yes	Yes	Yes	**YES**
Alternative 3	No	Yes	Yes	No	**NO**
Alternative 4	Yes	Yes	No	No	**NO**
Alternative 5	No	Yes	Yes	Yes	**NO**

2.5 DETAILED DESCRIPTION OF THE SELECTED ALTERNATIVES

NEPA and the CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for the Proposed Action. The NEPA process is intended to support flexible, informed decision-making; the analysis provided by this EA and feedback from the public and other agencies will inform decisions made about whether, when, and how to execute the Proposed Action. Two alternative actions meet the purpose of and need for the action, satisfy the criteria set forth in the selection standards, and were carried forward for further detailed analysis in this EA. The No Action Alternative provides a benchmark used to compare potential impacts of the Proposed Action. Alternatives carried forward for evaluation are described in **Sections 2.5.1** through **2.5.3**.

2.5.1 *Alternative 1: Contract Adversary Air Operating Out of Building 751*

Under Alternative 1, CAF would establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley. Operations would be located in a consolidated facility in Building 751 (refer to **Figure 2-1**). The contract ADAIR aircraft, maintenance, personnel, sorties, airspace use, and defensive countermeasures would be as described under Proposed Action.

2.5.2 *Alternative 2: Contract Adversary Air Operating Out of Buildings 751 and 790*

Under Alternative 2, CAF would establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley. Operations would be combined with the T-38 ADAIR mission in Building 790, while AMU and hangar space would be collocated in Building 751 (refer to

Figure 2-1). The contract ADAIR aircraft, maintenance, personnel, sorties, airspace use, and defensive countermeasures would be as described under the Proposed Action.

2.5.3 *No Action Alternative*

Analysis of the No Action Alternative provides a benchmark, enabling decision-makers to compare the magnitude of the potential environmental effects of the Proposed Action. NEPA requires an EA to analyze the No Action Alternative. No action means that an action would not take place at this time, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. No action for this EA reflects the status quo, where no additional contract ADAIR assets would be established at JBLE-Langley. The technologically deficient T-38 aircraft and organic JBLE-Langley ADAIR support would result in further declines in fielded pilot proficiency or combat operations. JBLE-Langley self-generated ADAIR support, the status quo following calendar year 2017 pilot increases, is causing declining quality of pilot production which consequently results in unsustainable operations posing an unacceptable threat to national security. Aircraft tasked to support ADAIR missions organically from within CAF would continue to experience their own readiness and proficiency challenges due to the lost training time they are experiencing.

2.6 MITIGATION AND BEST MANAGEMENT PLANS

Agencies are required to identify and include all relevant and reasonable mitigation measures that could reduce potential significant impacts. The CEQ regulations (40 CFR § 1508.20) define mitigation as

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing the impact by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- compensating for the impact by replacing or providing substitute resources or environments.

The development of mitigation measures in support of contract ADAIR at JBLE-Langley is necessary because the noise analysis in **Chapter 4** determined that implementation of the High Noise Scenario under the Proposed Action could result in potential significant impacts on the noise environment around the installation.

The type of aircraft that would be used by contract ADAIR is unknown at this time. The mitigation outlined in **Section 4.2** and **Appendix E** would only apply if aircraft similar to the High Noise Scenario comprise the contract ADAIR aircraft used at JBLE-Langley. If contract ADAIR aircraft selected for training at JBLE-Langley are similar to the Medium or Low Noise Scenarios, no mitigation would be required; therefore, the ultimate need for mitigation would be determined by the actual aircraft used for contract ADAIR.

BMPs are described, when applicable, in the environmental consequences discussion for each resource in **Chapter 4**. JBLE-Langley follows applicable Air Force regulations and BMPs as well as federal, state, and local regulations and directives.

2.7 SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

The potential impacts associated with Alternatives 1 and 2 and the No Action Alternative are summarized in **Table 2-6**. The summary is based on information discussed in detail in **Chapter 4** (**Environmental Consequences**) of the EA and includes a concise definition of the issues addressed and the potential environmental impacts associated with each alternative action.

Table 2-6
Comparison of Potential Environmental Consequences of the Proposed Action with Mitigation*

Alternative	Resource									
	Airspace Management and Use	Noise	Safety	Air Quality	Biological Resources	Land Use	Socioeconomics – Income and Employment	Environmental Justice – Protection of Children	Cultural Resources	Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances
Alternative 1: **Contract ADAIR operations with 4,100 additional sorties** **Operations and maintenance activities consolidated in Building 751**	**JBLE-Langley** Negligible impacts **Warning Areas** Negligible impacts	**JBLE-Langley** Under the Low and Medium Noise Scenarios, long-term negligible to minor increases to noise in the vicinity of the airfield. Under the High Noise Scenario, moderate impacts on select POIs with mitigation **Warning Areas** Negligible impacts Impacts associated with sonic booms would be negligible	**JBLE-Langley** No impacts on ground, explosive, or flight safety **Warning Areas** No impacts on safety	**JBLE-Langley** Minor increase in criteria pollutant emissions No impacts on the region's ability to comply with the NAAQS for regulated pollutants Would not hamper efforts to achieve compliance with ozone NAAQS under current requirements **Warning Areas** Minor increase in criteria pollutants No impacts on air quality	**JBLE-Langley** No impacts on vegetation or habitat Negligible impacts on wildlife from noise and aircraft movement Minor impacts on birds from potential aircraft/ bird collisions No impacts on marine mammals No impacts on federally listed species No impacts on Essential Fish Habitat **Warning Areas** No impacts on wildlife, from noise, including sonic booms The use of defensive countermeasures may affect but is not likely to adversely affect federally listed seabirds, marine mammals, and sea turtles	**JBLE-Langley** Moderate impacts on select POIs with mitigation **Warning Areas** Not Applicable	**JBLE-Langley** Moderate beneficial impact on economic environment Minor impact on housing/commercial property values with mitigation **Warning Areas** Not Applicable	**JBLE-Langley** No disproportionate impacts on minority or low-income populations with mitigation No disproportionate impacts on children Moderate impacts on children in educational facilities due to increased noise levels with mitigation **Warning Areas** Not Applicable	**JBLE-Langley** No impact on historic properties or archaeological resources No known traditional cultural resources or sacred sites are present **Warning Areas** No impact on potential submerged archaeological resources.	**JBLE-Langley** No impacts on hazardous waste management No impacts on asbestos-containing materials and lead-based paint management Long-term, minor beneficial impact on managing and disposal of polychlorinated biphenyls No impacts from radon No environmental contamination **Warning Areas** Not Applicable
Alternative 2: **Contract ADAIR operations with 4,100 additional sorties** **Operations activities in Building 790** **Maintenance activities in Building 751**	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Same as Alternative 1	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Same as Alternative 1	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Same as Alternative 1	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Same as Alternative 1	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Same as Alternative 1	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Not Applicable	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Not Applicable	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Not Applicable	**JBLE-Langley** Minor alteration to Hangar 751 interior with negligible impact No impact on archaeological deposits No known traditional cultural resources or sacred sites present **Warning Areas** Same as Alternative 1	**JBLE-Langley** Same as Alternative 1 **Warning Areas** Not Applicable

Table 2-6
Comparison of Potential Environmental Consequences of the Proposed Action with Mitigation*

Alternative	Resource									
	Airspace Management and Use	**Noise**	**Safety**	**Air Quality**	**Biological Resources**	**Land Use**	**Socioeconomics – Income and Employment**	**Environmental Justice – Protection of Children**	**Cultural Resources**	**Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances**
No Action Alternative	No change to airspace management and use at JBLE Langley/ Warning Areas	No change to noise setting at JBLE-Langley/Warning Areas	No change to ground, flight, or explosive safety at JBLE-Langley/ Warning Areas	No change to air quality at JBLE-Langley/ Warning Areas	No change to biological resources at JBLE-Langley/Warning Areas	No change to land use at JBLE-Langley/ Warning Areas	No change to socioeconomics – income and employment at JBLE-Langley	No disproportionate impacts on minority or low-income populations, or children in the community at JBLE-Langley	No change to cultural resources at JBLE-Langley/ Warning Areas	No change to hazardous materials and wastes, contaminated sites, and toxic substances at JBLE-Langley

Notes:

No, minor, or negligible impact Moderate impact but not significant Major, significant impact

* Where applicable, mitigation was included in the potential impacts summary.

ADAIR = adversary air; JBLE-Langley = Joint Base Langley-Eustis, Langley Air Force Base; N/A = not applicable; NAAQS = National Ambient Air Quality Standards; POI = point of interest

CHAPTER 3 AFFECTED ENVIRONMENT

Existing environmental conditions could be affected by the Proposed Action and alternatives. The existing conditions for relevant resources are defined to provide a meaningful baseline from which to compare potential future effects. In this chapter, each resource is defined and the geographic scope is identified, followed by a description of the existing conditions for that resource. The expected geographic scope of potential consequences is referred to as the ROI. The ROI boundaries would vary depending on the nature of each resource. For example, the ROI for some resources, such as socioeconomics – income and employment and air quality, extend over a larger jurisdiction unique to the resource. In addition, some resources discuss the available baseline data, installation (base) and airspace (Warning Areas), in the same section and some discuss these elements separately, depending on the complexity of the ROI.

3.1 AIRSPACE MANAGEMENT AND USE

3.1.1 *Definition of the Resource*

Airspace management involves the direction, control, and handling of flight operations in the airspace that overlies the borders of the United States and its territories. Under Title 49, U.S.C. § 40103, *Sovereignty and Use of Airspace*, and Public Law No. 103-272, the US government has exclusive sovereignty over the nation's airspace. The Federal Aviation Administration (FAA) has the responsibility to plan, manage, and control the structure and use of all airspace over the United States. FAA rules govern the national airspace system, and FAA regulations establish how and where aircraft may fly. Collectively, the FAA uses these rules and regulations to make airspace use as safe, effective, and compatible as possible for all types of aircraft, from private propeller-driven planes to large, high-speed commercial and military jets.

Aircraft use different kinds of airspace according to the specific rules and procedures defined by the FAA for each type of airspace. For the Proposed Action, the airspaces used would be three Warning Areas. A Warning Area is airspace of defined dimensions that extends from 3 nautical miles (NM) outward from the coast of the United States and may be over US waters, international waters, or both. The purpose of Warning Areas is to warn nonparticipating pilots of potentially hazardous activity. Warning Areas may be used for other purposes if released to the FAA during periods when not required for their intended purpose and are within areas in which the FAA has Air Traffic Control (ATC) authority.

Each military organization responsible for a Warning Area develops a daily use schedule. Although the FAA designates Warning Areas for military use, other pilots may transit the airspace. Avoidance procedures are maintained for each Warning Area, and military aircrews build them into daily flight plans.

The ROI for airspace use and management includes the JBLE-Langley airfield and environs as well as the Warning Areas depicted on **Figure 1-4**.

3.1.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

The JBLE-Langley airfield is operated by the 1 FW and 192 WG supporting military operations conducted by units stationed at the base. Military training has occurred in the vicinity of JBLE-Langley since 1916. With a large complement of F-22s and T-38A/Bs, the majority of operations at JBLE-Langley are performed by the 1 FW and 192 WG.

ATC for JBLE-Langley is provided by the Air Force. Controlled Class D airspace, extending upward from the surface up to and including 2,500 feet (ft) above ground level (AGL) within a 4-NM radius of JBLE-Langley, has been established around the airfield to support managing air traffic.

A variety of factors can influence the annual level of operational activity at an airfield, including economics, national emergencies, and maintenance requirements. Operations consist of arrivals and departures (itinerant) by primarily military aircraft, with a smaller amount of traffic from National Aeronautics and Space

Administration (NASA) turboprop aircraft flights. Military aircraft use makes up 92 percent of the airfield use, with the remaining amount used by NASA and transient aircraft flights (**Table 3-1**).

Table 3-1
Annual Operations at Joint Base Langley-Eustis, Langley Air Force Base

Use	Annual Operations	Percentage of Use
1st Fighter Wing	38,677	92
National Aeronautics and Space Administration	1,134	3
Transient	2,200	5
Total	**42,011**	**100**

3.1.3 *Existing Conditions – Airspace*

The affected environment for airspace management includes Warning Areas where aircraft based at JBLE-Langley perform training operations. JBLE-Langley F-22 and T-38A/B aircraft primarily train in Warning Areas W-72, W-122, and W-386 (see **Figure 1-4**). These Warning Areas are over water and are managed and scheduled by the US Navy. The vast majority of all aircraft operations in these airspaces are from US Navy units. These Warning Areas are described earlier in **Chapters 1** and **2**.

3.2 NOISE

3.2.1 *Definition of the Resource*

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound becomes noise when it is unwelcome and interferes with normal activities, such as sleep or conversation. Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (such as hearing loss or damage to structures) or subjective judgments (community annoyance). The response of different individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual. Noise also may affect wildlife through disruption of nesting, foraging, migration, and other life-cycle activities.

Sound is expressed in logarithmic units of decibels (dB). A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB; sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 to 140 dB are felt as pain (Berglund and Lindvall, 1995). The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB.

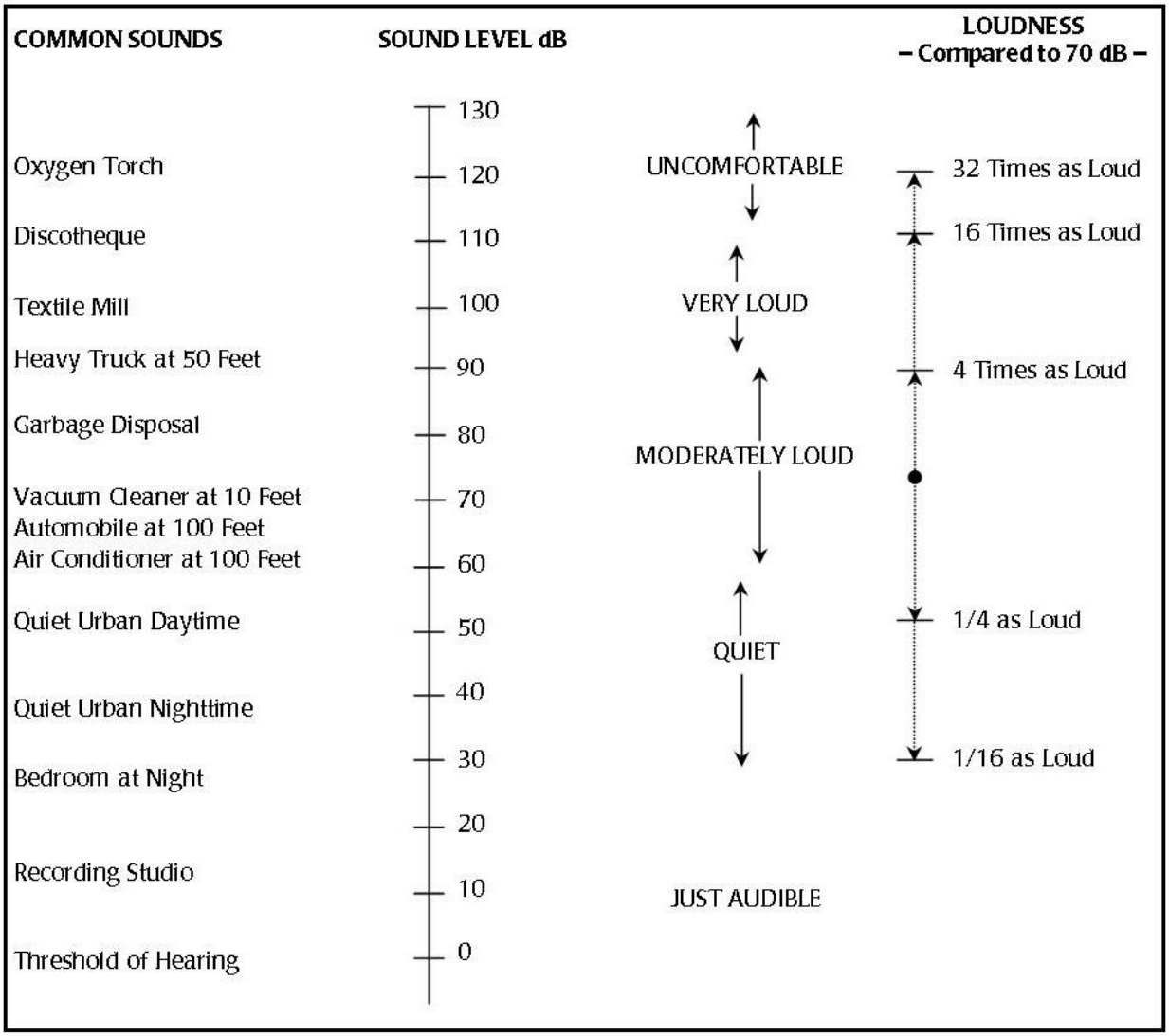
All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second, or hertz. To mimic the human ear's nonlinear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements usually employ an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the "A" to the measurement unit to identify that the measurement was made with this filtering process, for instance dBA. In this document, the dB unit refers to A-weighted sound levels unless otherwise noted.

A-weighted sound levels from common sources are given on **Figure 3-1**. Some sources, like the air conditioner and vacuum cleaner, are continuous sounds whose levels are constant for some time. Some

sources, like the automobile and heavy truck, are the maximum sound during an intermittent event like a vehicle pass-by. Some sources like “urban daytime” and “urban nighttime” are averages over extended periods. A variety of noise metrics have been developed to describe noise over different time periods.

Military aircraft generate two types of sound. One is subsonic noise, which is continuous sound generated by the aircraft’s engines and also by air flowing over the aircraft itself. Subsonic noise occurs at the airfields and in the airspace. The other type is supersonic noise consisting of sonic booms. Sonic booms are transient, impulsive sounds generated during supersonic flight. Supersonic flight must occur only within authorized airspace. These two types of noise differ in terms of characteristics.

Aircraft subsonic noise consists of two major types of sound events: flight events (including takeoffs, landings, and flyovers) and stationary events, such as engine maintenance run-ups. Noise from aircraft overflights typically occurs beneath main approach and departure paths and in local air traffic patterns around the airfield. Noise from stationary events typically occurs in areas near aircraft parking ramps and staging areas. As aircraft climb, the noise received on the ground drops to lower levels, eventually fading into the background or ambient levels.



Source: Harris, 1979.

Figure 3-1. Typical A-weighted Sound Levels of Common Sounds.

Aircraft in supersonic flight (i.e., exceeding the speed of sound, Mach 1) cause sonic booms. A sonic boom is characterized by a rapid increase in pressure, followed by a decrease before a second rapid return to normal atmospheric levels. This change occurs very quickly, usually within a few tenths of a second. It is usually perceived as a "bang-bang" sound. The amplitude of a sonic boom is measured by its peak overpressure, in pounds per square foot (psf). The amplitude depends on the aircraft's size, weight, geometry, Mach number, and flight altitude. Altitude is usually the biggest single factor. Maneuvers (turns, dives, etc.) also affect the amplitude of particular booms.

Not all supersonic flights cause sonic booms that are heard at ground level. As altitude increases, air temperature and sound speed decrease. These sound speed changes cause booms to be turned upward as they travel toward the ground. Depending on the altitude of the aircraft and the Mach number, many sonic booms can be bent upward such that they never reach the ground. This phenomenon, referred to as "cutoff," also acts to limit the width (area covered) of the sonic booms that do reach the ground. The overpressures of booms that reach the ground are well below those that would begin to cause physical injury to humans or animals. They can, however, be annoying and can cause startle reaction in humans and animals. On occasion, sonic booms can cause physical damage (e.g., to a window) if the overpressure is of sufficient magnitude. The condition of the structure is a major factor when damage occurs, the probability of which, tends to be low. For example, the probability of a 1-psf boom (average pressure in airspace) cracking plaster or breaking a window falls in the range of 1 in 10,000 to 1 in 10 million.

3.2.1.1 Noise Metrics

Noise metrics quantify sounds so they can be compared with each other, and with their effects, in a standard way. There are a number of metrics that can be used to describe a range of situations, from a particular individual event to the cumulative effect of all noise events over a long time. This section describes the metrics relevant to environmental noise analysis. Noise metrics and noise models are described in **Appendix B**.

Single Event Metrics

Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or Maximum Sound Level and is abbreviated L_{max}. The L_{max} is depicted for a sample event in **Figure 3-2**.

L_{max} is the maximum level that occurs over a fraction of a second. For aircraft noise, the "fraction of a second" is one-eighth of a second, denoted as "fast" response on a sound level measuring meter (American National Standards Institute, 1988). Slowly varying or steady sounds are generally measured over 1 second, denoted as "slow" response. L_{max} is important in judging if a noise event will interfere with conversation, television or radio listening, or other common activities. Although it provides some measure of the event, it does not fully describe the noise, because it does not account for how long the sound is heard.

Sound Exposure Level

Sound Exposure Level (SEL) combines both the intensity of a sound and its duration. For an aircraft flyover, SEL includes the maximum and all lower noise levels produced as part of the overflight, together with how long each part lasts. It represents the total sound energy in the event. **Figure 3-2** indicates the SEL for an example event, representing it as if all the sound energy were contained within 1 second.

Because aircraft noise events last more than a few seconds, the SEL value is larger than L_{max}. It does not directly represent the sound level heard at any given time but rather the entire event. SEL provides a much better measure of aircraft flyover noise exposure than L_{max} alone.

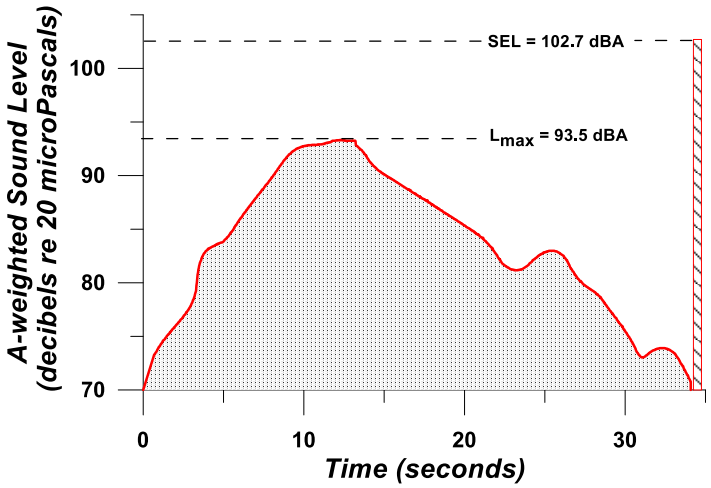


Figure 3-2. Example of Maximum Sound Level and Sound Exposure Level from an Individual Event.

Overpressure

The single event metrics commonly used to assess supersonic noise are overpressure in psf and C-Weighted Sound Exposure Level (CSEL). Overpressure is the peak pressure at any location within the sonic boom footprint.

C-Weighted Sound Exposure Level

CSEL is SEL computed with C frequency weighting, which is similar to A-Weighting (discussed in **Section 3.2.1**) except that C weighting places more emphasis on low frequencies below 1,000 hertz.

Cumulative Metrics

Equivalent Sound Level

Equivalent Sound Level (L_{eq}) is a "cumulative" metric that combines a series of noise events over a period of time. L_{eq} is the sound level that represents the decibel average SEL of all sounds in the time period. Just as SEL has proven to be a good measure of a single event, L_{eq} has proven to be a good measure of series of events during a given time period.

The time period of an L_{eq} measurement is usually related to some activity and is given along with the value. The time period is often shown in parenthesis (e.g., $L_{eq(24)}$ for 24 hours). The L_{eq} from 7:00 a.m. to 3:00 p.m. may give exposure of noise for a school day.

An example of $L_{eq(24)}$ using notional hourly average noise levels ($L_{eq[h]}$) for each hour of the day is given on **Figure 3-3**. The $L_{eq(24)}$ for this example is 61 dB.

Day-Night Average Sound Level

Day-Night Average Sound Level (DNL or L_{dn}) is a cumulative metric that accounts for all noise events in a 24-hour period; however, unlike $L_{eq(24)}$, DNL contains a nighttime noise penalty. To account for our increased sensitivity to noise at night, DNL applies a 10-dB penalty to events during the nighttime period, defined as 10:00 p.m. to 7:00 a.m. The notations DNL and L_{dn} are both used for Day-Night Average Sound Level and are equivalent. For airports and military airfields, DNL represents the average sound level for annual average daily aircraft events.

An example of DNL using notional hourly average noise levels ($L_{eq[h]}$) for each hour of the day is given on **Figure 3-3**. Note the $L_{eq(h)}$ for the hours between 10:00 p.m. and 7:00 a.m. (i.e., environmental night) have a 10-dB penalty assigned. DNL for the example noise distribution shown on **Figure 3-3** is 65 dB.

DNL does not represent a noise level heard at any given time but represents long-term exposure. Scientific studies have found good correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL (Schultz, 1978; US Environmental Protection Agency [USEPA], 1978).

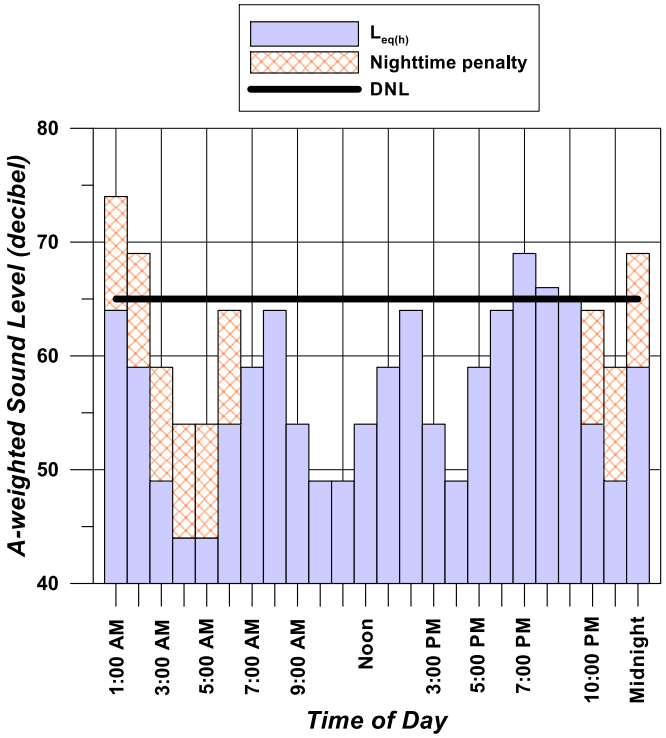


Figure 3-3. Example of Day-Night Average Sound Level Computed from Hourly Average Sound Levels.

Onset-Rate Adjusted Monthly Day-Night Average Sound Level

Military aircraft using special use airspace such as Military Training Routes, Military Operations Areas, Warning Areas, and restricted areas/ranges generate a noise environment that is somewhat different from that around airfields. Rather than regularly occurring operations like at airfields, activity in special use airspace is highly sporadic. It is often seasonal, ranging from 10 per hour to less than 1 per week. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset, with rates of up to 150 dB per second.

The cumulative daily noise metric devised to account for the "surprise" effect of the sudden onset of aircraft noise events on humans and the sporadic nature of special use airspace activity is the Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). Onset rates between 15 and 150 dB per second require an adjustment of 0 to 11 dB to the event's SEL, while onset rates below 15 dB per second require no adjustment to the event's SEL (Stusnick et al., 1992). The term 'monthly' in L_{dnmr} refers to the noise assessment being conducted for the month with the most operations or sorties, the busiest month.

3.2.1.2 Noise Models

This section summarizes the analysis tools used to calculate the noise levels for the EIAP.

NOISEMAP

Analyses of aircraft noise exposure and compatible land uses around DOD airfield-like facilities are normally accomplished using a group of computer-based programs, collectively called NOISEMAP (Czech and Plotkin, 1998; Wasmer and Maunsell, 2006a, 2006b). The core computational program of the NOISEMAP suite is NMAP. In this report, NMAP Version 7.3 was used to analyze aircraft operations and to generate noise contours.

MR_NMAP

When the aircraft flight tracks are not well defined and are distributed over a wide area, such as in Military Training Routes with wide corridors or Warning Areas, the Air Force uses the DOD-approved MR_NMAP program (Lucas and Calamia, 1996). In this report, MR_NMAP Version 3.0 was used to model subsonic aircraft noise in special use airspaces. For airspace environments where noise levels are calculated to be less than 45 dB, the noise levels are stated as "<45 dB."

PCBoom

Environmental analysis of supersonic aircraft operations requires calculation of sonic boom amplitudes. For the purposes of this study, the Air Force and DOD-approved PCBoom program was used to assess sonic boom exposure due to military aircraft operations in supersonic airspace. In this report, PCBoom Version 4 was used to calculate sonic boom ground signatures and overpressures from supersonic vehicles performing steady, level flight operations (Plotkin, 2002).

BooMap

For cumulative sonic boom exposure under supersonic air combat training arenas, the Air Force and DOD-approved BooMap program was used. In this report, BooMap96 was used to calculate cumulative C-weighted DNL (CDNL) exposure based on long term measurements in a number of airspaces (Plotkin, 1993).

The ROI for noise includes the JBLE-Langley airfield and environs as well as the Warning Areas depicted on **Figure 1-4**. Noise analysis at JBLE-Langley was conducted to update the airfield noise contours and the Warning Areas described in **Section 3.1.2**, in order to reflect the most recent and accurate aircraft operations and flying conditions.

3.2.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

As is normal for military installations with a flying mission, the primary driver of noise at JBLE-Langley is aircraft operations. Standard aircraft operations include takeoffs, landings, closed patterns, and static run-ups.

In addition to aviation noise, some additional noise results from the day-to-day activities associated with operations, maintenance, and the industrial functions associated with the operations of the airfield. These noise sources include the operations of ground-support equipment, and other transportation noise from vehicular traffic. Noise resulting from aircraft operations remains the dominant noise source.

Aircraft operations at JBLE-Langley consist of based military aircraft, civilian aircraft, and a variety of transient aircraft. Existing annual aircraft operations at JBLE-Langley total 42,011, as summarized in **Table 3-2**. An operation is defined as a single takeoff or landing. Closed patterns consist of two operations, one departure and one arrival (e.g., two closed pattern circuits consist of four total operations). The table pattern numbers are operation counts, not pattern circuit counts. JBLE-Langley's

Runway 08 is used for 60 percent of military aircraft operations while Runway 26 is used for the remaining 40 percent of operations. The majority of aircraft operations at JBLE-Langley are performed by the based F-22 and T-38A/B aircraft. A more detailed existing annual aircraft operations table can be found in **Appendix B**.

Table 3-2
Existing Annual Aircraft Operations Summary at Joint Base Langley-Eustis, Langley Air Force Base

Aircraft	Departures		Arrivals		Closed Patterns		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
F-22	7,485	73	7,407	151	7,561	0	22,453	224	22,677
T-38A/B	4,000	0	4,000	0	8,000	0	16,000	0	16,000
National Aeronautics and Space Administration	561	6	561	6	0	0	1,122	12	1,134
Transients	1,070	30	1,070	30	0	0	2,140	60	2,200
Grand Total	**13,116**	**109**	**13,038**	**187**	**15,561**	**0**	**41,715**	**296**	**42,011**

The resultant 65- to 85-dBA DNL contours in 5-dBA increments for the existing daily flight events at JBLE-Langley are shown on **Figure 3-4**. In accordance with AFH 32-7084, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations. It should be emphasized that these noise levels, which are often shown graphically as contours on maps, are not discrete lines that sharply divide louder areas from land largely unaffected by noise. Instead, they are part of a planning tool that depicts the general noise environment around the installation based on typical aviation activities. Areas beyond the 65-dBA DNL can also experience levels of appreciable noise depending upon training intensity or weather conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational tempo due to unit deployments, funding levels, and other factors. Static run-up operations, such as maintenance and pre/post-flight run-ups, were also modeled. A more detailed discussion of run-up operations at JBLE-Langley can be found in **Appendix B**.

The prominent features from **Figure 3-4** are the extents of the DNL contours along the extended centerline of Runway 08/26. The 65-dBA DNL contour extends beyond the base boundary, approximately 3.2 miles (mi) to the west and approximately 3.4 mi to the east from the end of the runway. The 70-dBA DNL contour extends approximately 2.0 mi to the west and 2.4 mi to the east from the end of the runway. The 75-dBA DNL contour extends approximately 1.3 mi to the west and 1.4 mi to the east from the end of the runway. The area within each DNL noise contour for the existing conditions as shown on **Figure 3-4** are shown in **Table 3-3**.

A number of points of interest (POI) have been identified in the vicinity of JBLE-Langley. These POIs, shown on **Figure 3-5**, are made up of noise sensitive receptors such as homes, schools, hospitals, and places of worship. **Table 3-4** lists the DNL as a result of aircraft operations at JBLE-Langley at the 23 POIs for the existing conditions. Seven of the 23 POIs are exposed to DNL between 60 and 65 dBA, and 13 of the POIs are exposed to DNL higher than 65 dBA.

THE FIRST STEP IN IDENTIFYING NOISE SENSITIVE RECEPTORS, ALSO REFERRED TO AS POINTS OF INTEREST (POIS) AROUND MILITARY AIRFIELDS IS TO REVIEW PUBLISHED NATIONAL ENVIRONMENTAL POLICY ACT AND/OR AIR INSTALLATION COMPATIBLE USE ZONE REPORTS TO DETERMINE PREVIOUSLY IDENTIFIED POIS. THESE TYPICALLY INCLUDE SCHOOLS, PLACES OF WORSHIP, AND RESIDENTIAL AREAS AROUND THE AIRFIELD. IN ADDITION, INSTALLATION PERSONNEL WORK WITH THE COMMUNITY TO IDENTIFY AREAS AROUND THE AIRFIELD THAT SHOULD BE CONSIDERED FOR NOISE ANALYSIS.

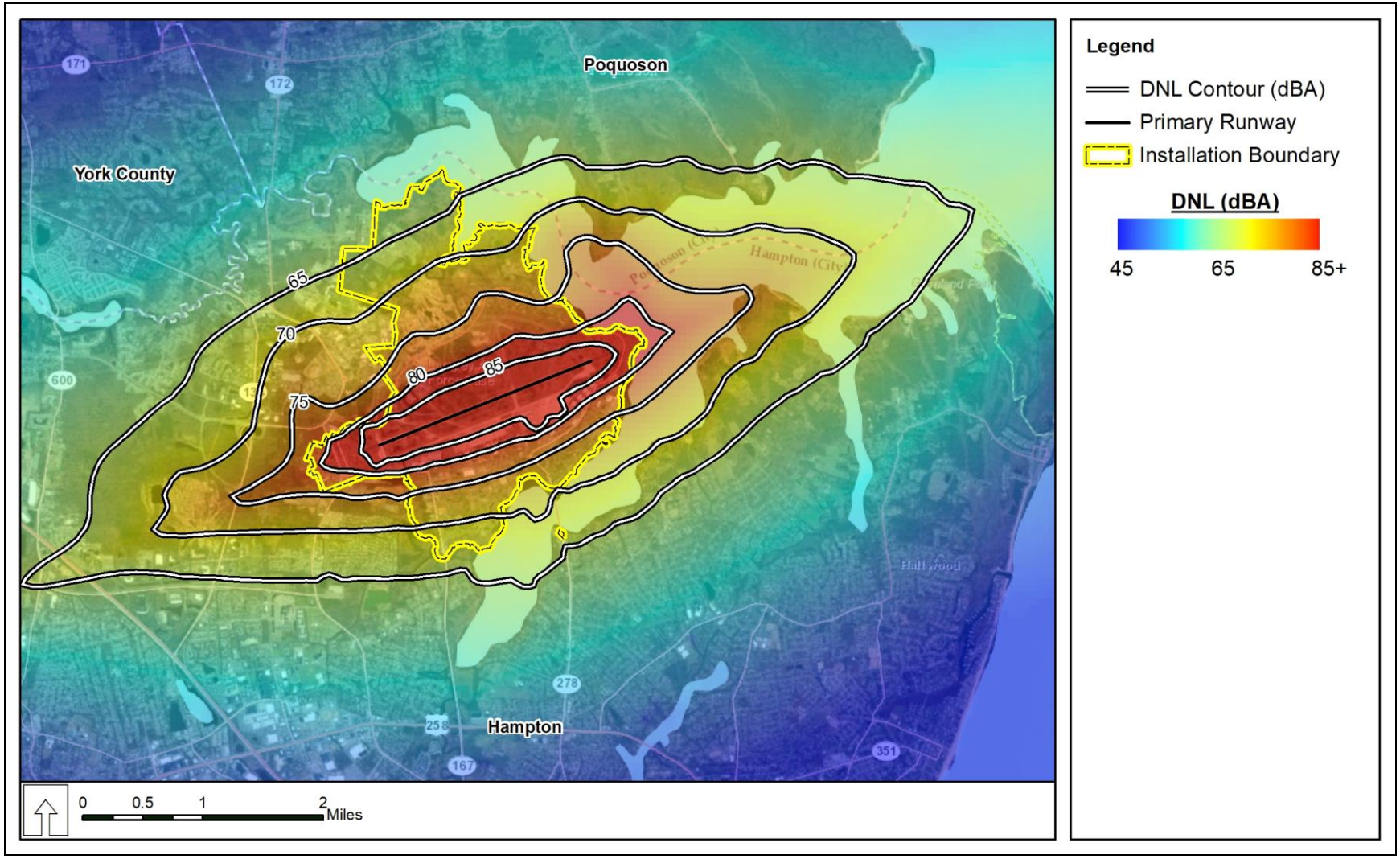


Figure 3-4. Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

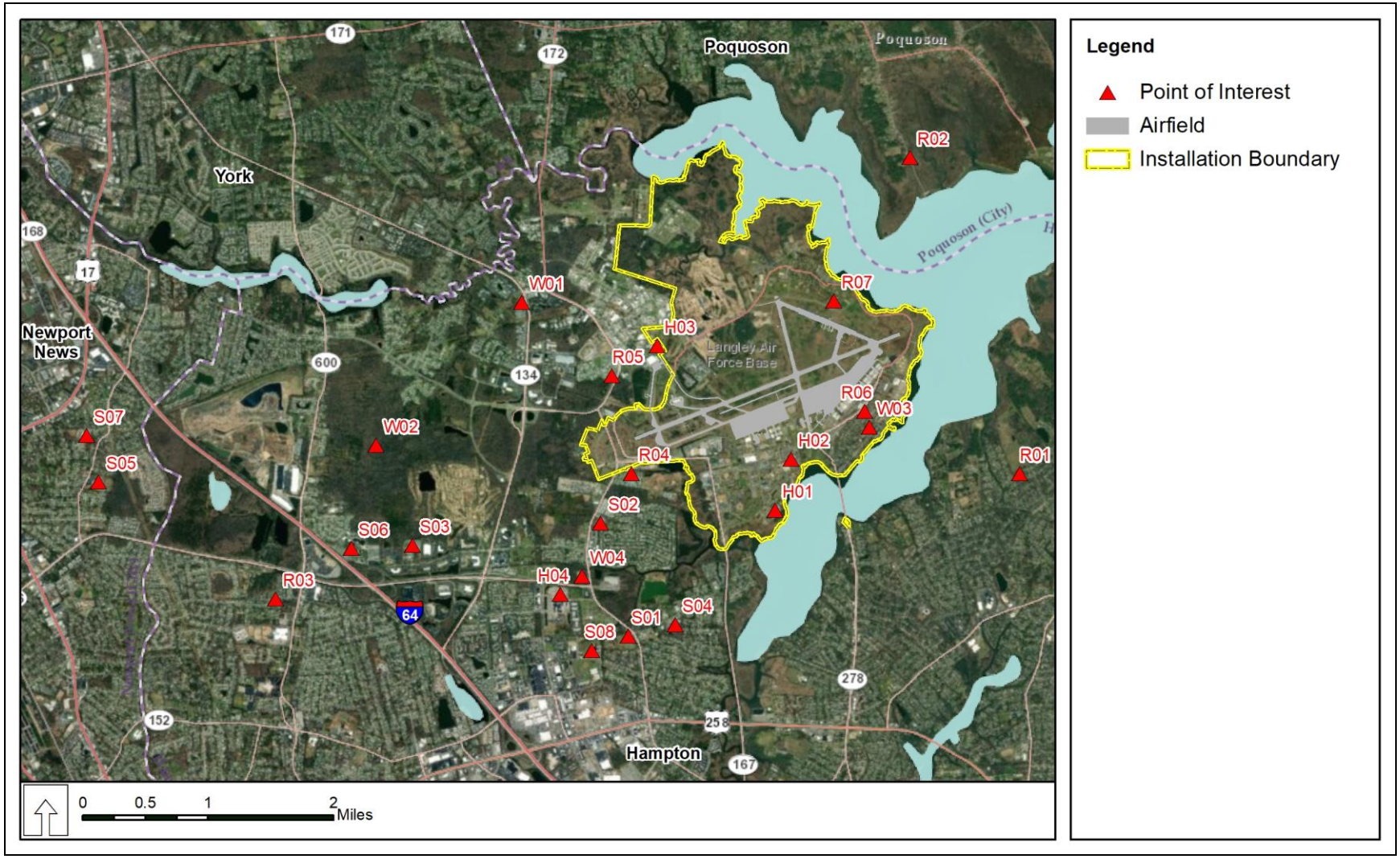


Figure 3-5. Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base.

Table 3-3
Existing Day-Night Average Sound Level Area Affected at Joint Base Langley-Eustis, Langley Air Force Base

Noise Level (dBA DNL)	Area Within Noise Contour (acres)
>65	10,524
>70	5,778
>75	2,707
>80	1,149
>85	555

Notes:
[1] Area (on- and off-base) was based off NOISEMAP modeled noise contours and used to calculate the amount of land within each noise contour. The amounts shown are cumulative, i.e., the acreage within the >85-dBA contour is also within all the lower noise level contours.

dBA = A-weighted decibel; DNL = Day-Night Average Sound Level

Table 3-4
Existing Day-Night Average Sound Level at Points of Interest at Joint Base Langley-Eustis, Langley Air Force Base

POIs		DNL (dBA)
ID	Description	
H01	Langley Air Force Base Child Development Center	69
H02	Langley Air Force Base Hospital	75
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74
H04	Sentara Hospital	63
R01	Residential #1, Fox Hill	62
R02	Residential #2, Poquoson	67
R03	Residential #3, Michael's Woods	63
R04	Residential #4, Mobile Home Park West Gate	77
R05	Residential #5, Mobile Home Park Langley Speedway	74
R06	Residential #6, Langley Air Force Base Officer's Housing	76
R07	Residential #7, Enlisted Base Housing	77
S01	Hampton Christian Academy	60
S02	Machen Elementary School	70
S03	New Horizons Regional Education Center	67
S04	Paul Burbank Elementary School	60
S05	Peninsula Catholic School	53
S06	Thomas Nelson Community College	67
S07	Watkins Early Childhood Center	52
S08	William Mason Cooper Elementary School	59
W01	Emmanuel Lutheran Church	66
W02	Faith Baptist Church	65
W03	Langley Air Force Base Chapel	74
W04	Sharon Baptist Church	65

Notes:
Affected POIs based on NOISEMAP-modeled noise contours and used to calculate the POIs within each noise contour.

dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

3.2.3 *Existing Conditions – Airspace*

The primary special use airspaces used by JBLE-Langley based aircraft are Warning Areas W-72, W-122, and W-386. W-386 receives approximately 90 percent of all airspace operations originating from JBLE-Langley while W-72 and W-122 each receive approximately 5 percent each. A summary of JBLE-Langley's annual airspace operations is presented in **Table 3-5**. A summary of airspace operations from JBLE-Langley's biannual Trilateral Multinational large force exercise, which occurs solely in Warning Area W-122, is also included in **Table 3-5**.

Table 3-5
Existing Annual Airspace Operations Summary by Joint Base Langley-Eustis, Langley Air Force Base in the Warning Areas W-72, W-122, and W-386

Aircraft	W-72		W-122		W-386		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
F-22	367	12	367	12	6,604	205	7,338	229	7,567
T-38A/B	174	0	174	0	3,118	0	3,466	0	3,466
Large Force Exercise	0	0	48	0	0	0	48	0	48
Grand Total	**541**	**12**	**589**	**12**	**9,722**	**205**	**10,852**	**229**	**11,081**

As previously discussed in **Section 3.1.2**, aircraft operations from the US Navy make up the vast majority of total air operations in W-72, W-122, and W-386[1]. The noise environments (both subsonic and supersonic) in these Warning Areas are dominated by US Navy aircraft operations.

Supersonic operations are allowed in Warning Areas W-72, W-122, and W-386. Airspace sorties require aircraft to exceed Mach 1.0 (supersonic) for brief periods of time for approximately 10 percent of total flight time. This is equivalent to less than 5 minutes of supersonic flight activity per sortie.

Single event sonic boom levels estimated for existing supersonic flights in the Warning Areas are shown in **Table 3-6**. Overpressure (psf) and CSEL (decibels) were estimated directly under the flight path for the F-22 and T-38A/B aircraft at various altitudes and Mach numbers. Overpressure levels estimated for Warning Areas W-72, W-122, and W-386 range from 6.2 to 0.9 psf depending on the flight conditions.

When sonic booms reach the ground, they impact an area that is referred to as a "carpet." The size of the carpet depends on the supersonic flight path and on atmospheric conditions. The width of the boom carpet beneath the aircraft is about 1 mi for each 1,000 ft of altitude (NASA, 2017b). Sonic booms are loudest near the center of the carpet, having a sharp "bang-bang" sound. Near the edges, they are weak and have a rumbling sounding like distant thunder. The boom levels shown in **Table 3-6** are the loudest levels computed at the center of the carpet, directly under the flight path, for the constant Mach, level flight conditions indicated. The location of these booms would vary with changing flight paths and weather conditions, so it is unlikely that any given location would experience these undertrack levels more than once over multiple events. Public reaction (limited to vessels 15 NM from shore) is expected to occur with overpressures above 1 psf, and in rare instances, damage to structures have occurred at overpressures between 2 and 5 psf (NASA, 2017b). People located farther away from the supersonic flight paths, who are still within the primary boom carpet, might also be exposed to levels that may be startling or annoying, but the probability of this decreases the farther away they are from the flight path. People located beyond the edge of the boom carpet are not expected to be exposed to sonic boom although post-boom rumbling sounds may be heard.

[1] William Reabe, Air Warfare Division (OPNAV N98), Naval Airspace and ATC Standards and Evaluation Agency, JBLE, Virginia, e-mail to John Saghera, ACC/A3TO, 27 January 2018.

Table 3-6
Warning Areas W-72, W-122, and W-386: Sonic Boom Levels Undertrack for Based Aircraft in Level Flight at Mach 1.2 and 1.5

Aircraft	Altitude (feet above mean sea level)			
	10,000	20,000	30,000	40,000
Mach 1.2				
Overpressure (psf)				
F-22	5.4	2.8	1.9	1.4
T-38A/B	3.3	1.8	1.2	0.9
C-Weighted Sound Exposure Level (dB)[1]				
F-22	116	111	107	105
T-38A/B	112	107	103	101
Mach 1.5				
Overpressure (psf)				
F-22	6.2	3.2	2.1	1.5
T-38A/B	3.8	2.0	1.3	0.9
C-Weighted Sound Exposure Level (dB)[1]				
F-22	117	112	108	105
T-38A/B	113	108	104	101

Note:
C-weighted Sound Exposure Level (CSEL) – SEL with frequency weighting that places more emphasis on low frequencies below 1,000 hertz

dB = decibel(s); psf = pound(s) per square foot

3.3 SAFETY

3.3.1 *Definition of the Resource*

Safety concerns associated with ground, explosive, and flight activities are considered in this section. Ground safety considers issues associated with ground operations and maintenance activities that support unit operations including arresting gear capability, jet blast/maintenance testing, and safety danger. Aircraft maintenance testing occurs in designated safety zones. Ground safety also considers the safety of personnel and facilities on the ground that may be placed at risk from flight operations in the vicinity of the airfield and in the airspace. CZs and Accident Potential Zones (APZs) around the airfield restrict the public's exposure to areas where there is a higher accident potential. Although ground and flight safety are addressed separately, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns.

Explosives safety relates to the management and safe use of ordnance and munitions. Flight safety considers aircraft flight risks such as midair collision, bird/wildlife-aircraft strike hazard (BASH), and in-flight emergency. Contract ADAIR aircraft would follow Air Force safety procedures and aircraft specific emergency procedures based on the design which are produced by the original equipment manufacturer of the aircraft. Basic airmanship procedures also exist for handling any deviations to ATC procedures due to an in-flight emergency; these procedures are defined in AFI 11-202 (Volume 3), *General Flight Rules*, and established aircraft flight manuals. The Flight Crew Information File is a safety resource for aircrew day-to-day operations which is composed of air and ground operation rules and procedures.

Existing conditions are organized by ground, explosive, and flight safety. The ROI includes JBLE-Langley and areas immediately adjacent to the base where ground and explosive safety concerns are described, as well as the airfield and airspaces where flight safety is discussed.

3.3.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base and Airspace*

3.3.2.1 Ground Safety

Ground safety includes several categories including ground and industrial operations, operational activities, and motor vehicle use. Ground mishaps can occur from the use of equipment or materials and maintenance functions. Day-to-day operations and maintenance activities conducted by the 1 FW and 192 WG are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements.

Emergency Response

For emergency response, the Air Force provides emergency responders (Airport Firefighter) trained on the applicable mission design series. For crash response, the DOD provides on-field aircraft crash damaged or disabled aircraft recovery (CDDAR). For events occurring off base, civilian authorities (city, county, or state) are first on scene; once on scene, the Air Force provides an Incident Commander and command staff for site management, security, and safety investigation purposes.

Safety Zones

Safety zones around airfields that restrict incompatible land uses are designated to reduce exposure to aircraft safety hazards. These include the CZs, which are areas immediately beyond the ends of a runway, and APZ I and APZ II, which are areas beyond the CZ. The standards for CZs and APZs are established by DODI 4165.57, *Air Installations Compatible Use Zones*. Within the CZ, which covers a 3,000-by-3,000-ft area at the end of each runway, the overall accident risk is the highest. APZ I, which extends for 5,000 ft beyond the CZ, is an area of reduced accident potential. In APZ II, which is 7,000 ft long, accident potential is the lowest among the three zones.

Open space (undeveloped) and agricultural uses (excluding raising of livestock) are the only uses deemed compatible in a CZ. Land use within APZs is based on the concept of limiting density of land use, and uses such as residential development, educational facilities, and medical facilities are considered incompatible and are strongly discouraged. Within the CZ at JBLE-Langley, there are approximately 33 acres (ac) of incompatible land use, as well as about 721 ac of incompatible land use in the APZs (JBLE, 2017a). The safety zones are shown on **Figure 3-6**.

Quantity-distance (Q-D) arcs are an additional safety zone and are described in **Section 3.3.2.2 (Explosive Safety)**.

Arresting Gear Capability

Per AFI 32-1043, *Managing Aircraft Arresting Systems*, criteria for siting aircraft arresting systems vary according to the type of system and operational requirement. The best location for runways used extensively during instrument meteorological conditions is 2,200 to 2,500 ft from the threshold; however, if aircraft that are not compatible with the arresting system must operate on the same runway, the installation commander may shift the installation site as close to the threshold as possible. The critical factor in this case is assurance that the runout area for an aircraft engaging the system in an aborted takeoff scenario is large enough to safely accommodate other arresting systems or equipment such as light fixtures. JBLE-Langley has BAK-12 cable arresting systems on each end of Runway 08/26. An E-5 arresting gear is installed in the overrun of Runway 26 (end of runway) designated for replacement by a BAK-15. A BAK-15 (hook/net) arresting gear is installed in the overrun of Runway 08 (end of runway).

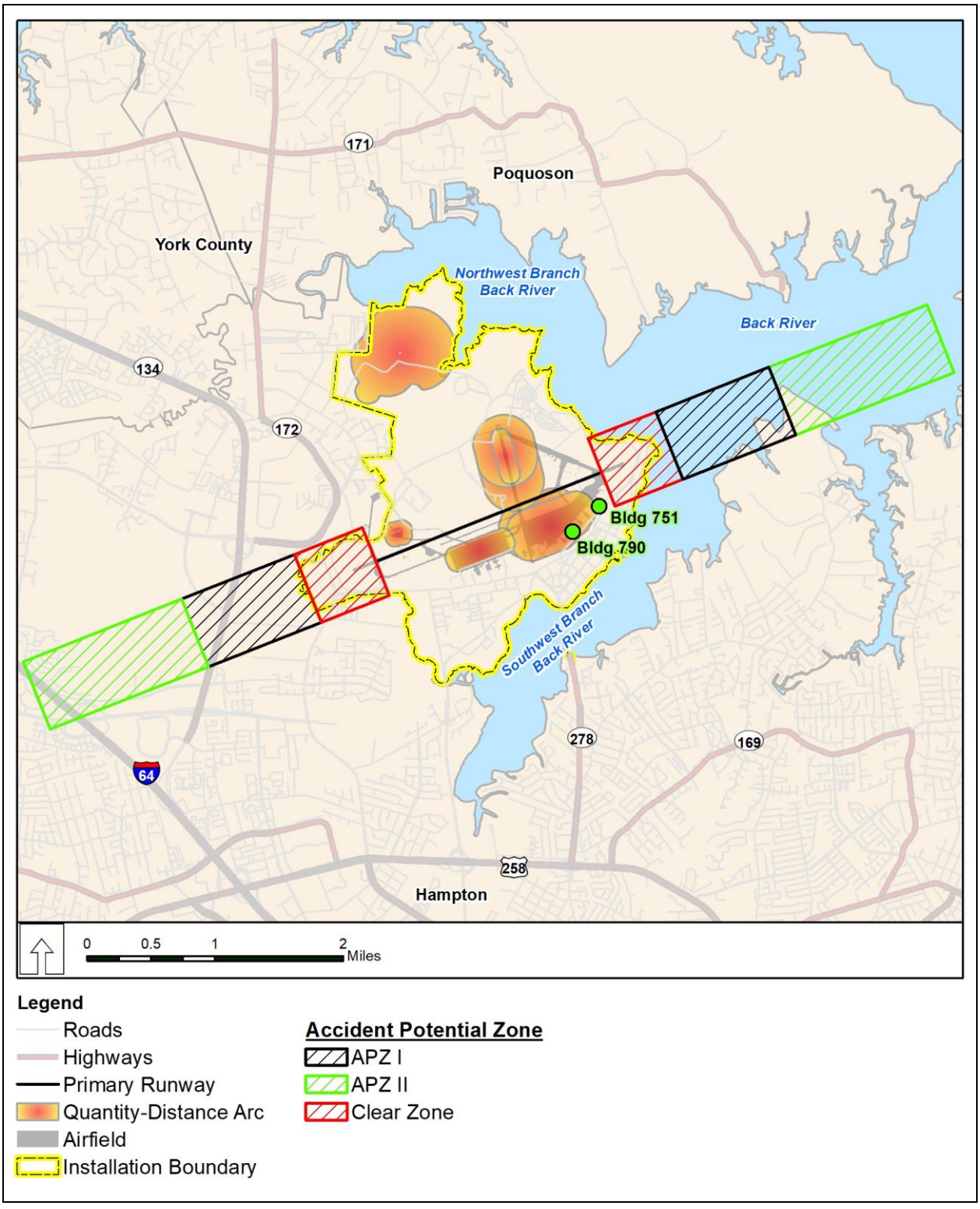


Figure 3-6. Joint Base Langley-Eustis, Langley Air Force Base Clear Zones, Accident Potential Zones, and Quantity-Distance Arcs.

3.3.2.2 Explosive Safety

The 1 FW and 192 WG have Munitions Flights assigned to the 1 MXS/192 MXS located at the airfield at JBLE-Langley. Personnel assigned to the 1 MXS/192 MXS Munitions Flights currently support the 1 FW and 192 WG flying mission with munitions support, including storage, inspection, maintenance, and accountability as well as delivery and pick-up of aircraft munitions to the airfield.

Aircraft munitions include ammunition, propellants (solid and liquid), pyrotechnics, warheads, explosive devices, and chemical agent substances and associated components that present real or potential hazards to life, property, or the environment. Air Force Manual (AFMAN) 91-201, *Explosives Safety Standards*, defines the guidance and procedures dealing with munition storage and handling.

During typical training operations, aircraft are not loaded with high-explosive ordnance. Training munitions usually include captive air-to-air training missiles, countermeasure chaff and flares, and cannon ammunition with inert projectiles. All munitions are stored and maintained in the munitions storage area within facilities sited for the allowable types and amounts of explosives. All storage and handling of munitions are carried out by trained and qualified Munitions Flight personnel and in accordance with Air Force-approved technical orders.

Defined distances are maintained between munitions storage areas and a variety of other types of facilities. These distances, called Q-D arcs, are determined by the type and quantity of explosive material to be stored. Each explosive material storage or handling facility has Q-D arcs extending outward from its sides and corners for a prescribed distance. Within these Q-D arcs, development is either restricted or prohibited altogether to ensure personnel safety and to minimize potential for damage to other facilities in the event of an accident. In accordance with AFMAN 91-201, paragraphs 12.47.2 and 12.47.3, the ramp does not need to be sited for chaff and flares and is not currently sited for Hazard Class 1.3. The Q-D arcs on JBLE-Langley are shown on **Figure 3-6**.

3.3.2.3 Flight Safety

Located at 1 FW Headquarters Building on JBLE-Langley, one control tower supports the training and readiness for the 1 FW, 192 WG, and other units supported by JBLE-Langley including NASA, transient aircraft, JBLE-Eustis aircraft and distinguished visitor aircraft flying missions. The control tower manages aircraft flying within a range of 5 mi of the base. Aircraft flying beyond 5 mi are transferred to Norfolk terminal radar approach control.

The potential for aircraft accidents is a primary public concern with regard to flight safety. Such accidents may occur as a result of midair collisions, collisions with manmade structures or terrain, mechanical failure, weather-related accidents, pilot error, BASH, or strikes from defensive countermeasures used during training.

Midair Collision

Midair collision accidents involve two or more aircraft coming in contact with each other during flight. Navigation errors, miscommunications, deviations from flight plans, and lack of collision avoidance systems all increase the potential for midair collisions. Aircraft mishaps and their prevention represent a paramount concern for the Air Force. Air Force Policy Directive (AFPD) 91-2, *Safety Programs*, defines four major categories of reportable mishaps based on total cost of property damage or the degree of injury: Class A, B, C, and D mishaps. Mishap types range from loss of life or destruction of an aircraft (Class A) to a minor, reportable injury or property damage less than $50,000 (Class D). Reporting and investigation requirements for aviation mishaps are defined in AFI 91-204, *Safety Investigation and Hazard Reporting*, and AFMAN 91-223, *Safety: Aviation Safety Investigations and Reports*.

In-Flight Emergency

Each aircraft type has different emergency procedures based on the aircraft design which are produced by the original equipment manufacturer of the aircraft. Basic airmanship procedures also exist for handling any deviations to ATC procedures due to an in-flight emergency; these procedures are defined in AFI 11-202 (Volume 3) and established aircraft flight manuals.

Bird/Wildlife-Aircraft Strike Hazards

BASH presents a safety concern for aircraft operations because of the potential for damage to aircraft or injury to aircrews or local populations if a crash should occur. Aircraft can encounter birds at nearly all altitudes up to 30,000 ft MSL; however, most birds fly close to the ground. According to the Air Force Safety Center, BASH statistics, about 52 percent of strikes occur from birds flying below 400 ft, and 88 percent occur at less than 2,000 ft AGL (Air Force Safety Center, 2018).

The Air Force BASH program was established to minimize the risk for collisions of birds/wildlife with aircraft and the subsequent loss of life and property. In accordance with AFI 91-202, *The US Air Force Mishap Prevention Program*, each flying unit in the Air Force is required to develop a BASH plan to reduce hazardous bird/wildlife activity relative to airport flight operations. The intent of each plan is to reduce BASH issues at the airfield by creating an integrated hazard abatement program through monitoring, avoidance, and actively controlling bird and animal population movements. Some of the procedures used at JBLE-Langley include determining the bird watch condition which may restrict how wing assigned aircraft operate in Class D airspace. The Supervisor of Flight makes the determination for the bird watch condition during wing flying whereas airfield management decides this condition during periods outside of wing flying.

3.4 AIR QUALITY

3.4.1 *Definition of the Resource*

Under the authority of the Clean Air Act (CAA) and subsequent regulations, the USEPA has divided the country into geographical regions known as Air Quality Control Regions (AQCRs) to evaluate compliance with the National Ambient Air Quality Standards (NAAQS). JBLE-Langley is located in the independent city of Hampton, which is located in the Hampton Roads Intrastate AQCR (40 CFR § 81.93). This AQCR includes four counties (York, James City, Isle of Wight, and Southampton), as well as ten independent cities (Chesapeake, Hampton, Newport News, Norfolk, Poquson, Franklin, Portsmouth, Suffolk, Virginia Beach, and Williamsburg).

For air quality, there are two ROIs, one coinciding with the Hampton Roads AQCR and another coinciding with the airspace within the three Warning Areas (W-386, W-122, and W-72). For consideration of potential air quality impacts, it is the volume of air extending up to the mixing height (3,000 ft AGL) and coinciding with the spatial distribution of the ROIs that is considered in this section. The mixing height is the altitude at which the lower atmosphere will undergo mechanical or turbulent mixing, producing a nearly uniform air mass. The height of the mixing level determines the volume of air within which pollutants can disperse. Pollutants that are released above the mixing height typically will not disperse downward and thus will have little or no effect on ground level concentrations of pollutants. Mixing heights at any one location or region can vary by the season and time of day, but for air quality applications, an average mixing height of 3,000 ft AGL is an acceptable default value (40 CFR § 93.153[c][2]).

3.4.1.1 Criteria Pollutants

In accordance with CAA requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. Measurements of these “criteria pollutants” in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$).

Regional air quality is a result of the types and quantities of atmospheric pollutants and pollutant sources in an area as well as surface topography, the size of the "air basin," and prevailing meteorological conditions. The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed numerical concentration-based standards, NAAQS, for pollutants that have been determined to impact human health and the environment and established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulates equal to or less than 10 microns in diameter (PM_{10}) and particulates equal to or less than 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources in addition to maintaining visibility standards. The primary and secondary NAAQS are presented in **Table 3-7.**

Table 3-7
National Ambient Air Quality Standards

Pollutant	Standard Value[6]		Standard Type
Carbon Monoxide (CO)			
8-hour average	9 ppm	(10 mg/m^3)	Primary
1-hour average	35 ppm	(40 mg/m^3)	Primary
Nitrogen Dioxide (NO_2)			
Annual arithmetic mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
1-hour average[1]	0.100 ppm	(188 µg/m^3)	Primary
Ozone (O_3)			
8-hour average[2]	0.070 ppm	(137 µg/m^3)	Primary and Secondary
Lead (Pb)			
3-month average[3]		0.15 µg/m^3	Primary and Secondary
Particulate <10 Micrometers (PM_{10})			
24-hour average[4]		150 µg/m^3	Primary and Secondary
Particulate <2.5 Micrometers ($PM_{2.5}$)			
Annual arithmetic mean[4]		12 µg/m^3	Primary
Annual arithmetic mean[4]		15 µg/m^3	Secondary
24-hour average[4]		35 µg/m^3	Primary and Secondary
Sulfur Dioxide (SO_2)			
1-hour average[5]	0.075 ppm	(196 µg/m^3)	Primary
3-hour average[5]	0.5 ppm	(1,300 µg/m^3)	Secondary

Notes:

1 In February 2010, the USEPA established a new 1-hour standard for NO_2 at a level of 0.100 ppm, based on the 3-year average of the 98th percentile of the yearly distribution concentration, to supplement the then-existing annual standard.

2 In October 2015, the USEPA revised the level of the 8-hour standard to 0.070 ppm, based on the annual 4th highest daily maximum concentration, averaged over 3 years; the regulation became effective on 28 December 2015. The previous (2008) standard of 0.075 ppm remains in effect for some areas. A 1-hour standard no longer exists.

3 In November 2008, USEPA revised the primary lead standard to 0.15 µg/m^3. USEPA revised the averaging time to a rolling 3-month average.

4 In October 2006, USEPA revised the level of the 24-hour $PM_{2.5}$ standard to 35 µg/m^3 and retained the level of the annual $PM_{2.5}$ standard at 15 µg/m^3. In 2012, USEPA split standards for primary & secondary annual $PM_{2.5}$. All are averaged over 3 years, with the 24-hour average determined at the 98th percentile for the 24-hour standard. USEPA retained the 24-hour primary standard and revoked the annual primary standard for PM_{10}.

5 In 2012, the USEPA retained a secondary 3-hour standard, which is not to be exceeded more than once per year. In June 2010, USEPA established a new 1-hour SO_2 standard at a level of 75 parts per billion, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

6 Parenthetical value is an approximately equivalent concentration for NO_2, O_3, and SO_2.

µg/m^3 = microgram(s) per cubic meter; mg/m^3 = milligram(s) per cubic meter; ppm = part(s) per million; USEPA = United States Environmental Protection Agency

The criteria pollutant O_3 is not usually emitted directly into the air but is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants, or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_x.

The USEPA has recognized that particulate matter emissions can have different health affects depending on particle size and, therefore, developed separate NAAQS for coarse particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$). The pollutant $PM_{2.5}$ can be emitted from emission sources directly as very fine dust and/or liquid mist or formed secondarily in the atmosphere as condensable particulate matter, typically forming nitrate and sulfate compounds. Secondary (indirect) emissions vary by region depending upon the predominant emission sources located there and thus which precursors are considered significant for $PM_{2.5}$ formation and identified for ultimate control.

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. When a region or area fails to meet a NAAQS for a pollutant, that region is classified as "non-attainment" for that pollutant. In such cases the affected State must develop a State Implementation Plan (SIP) that is subject to USEPA review and approval. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.

The CAA required the USEPA draft general conformity regulations that are applicable in nonattainment areas, or in designated maintenance areas (i.e., attainment areas reclassified from a previous nonattainment status, which are required to prepare a maintenance plan for air quality). These regulations are designed to ensure that federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and the promulgated regulations found in 40 CFR Part 93 exempt certain federal actions from conformity determinations (e.g., contaminated site cleanup and natural disaster response activities). Other federal actions are assumed to conform if total indirect and direct project emissions are below *de minimis* levels presented in 40 CFR § 93.153. The threshold levels (in tons of pollutant per year) depend upon the nonattainment status that USEPA has assigned to a region. Once the net change in nonattainment pollutants is calculated, the federal agency must compare them to the *de minimis* thresholds.

Title I of the CAA Amendments of 1990 requires the federal government to reduce emissions from cars, trucks, and buses; from consumer products such as hair spray and window-washing compounds; and from ships and barges during the loading and unloading of petroleum products to address urban air pollution problems of ozone, CO, and PM_{10}. Under Title I, the federal government develops the technical guidance that states need to control stationary sources of pollutants. Title I also allows the USEPA to define boundaries of nonattainment areas. Title V of the CAA Amendments of 1990 requires state and local agencies to implement permitting programs for major stationary sources. A major stationary source is a facility (plant, base, activity, etc.) that has the potential to emit (PTE) more than 100 tons annually of any one criteria air pollutant in an attainment area.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be "significant" if a proposed project's net emission increase meets or exceeds the rate of emissions listed in 40 CFR § 52.21(b)(23)(i); or (1) a proposed project is within 10 kilometers (km) of any Class I area (wilderness area greater than 5,000 ac or national park greater than 6,000 ac).

Although Titles I and V of the Clean Air Act Amendments of 1990 apply to JBLE-Langley, compliance requirements under the relevant regulations would not apply. This is because virtually all of the emissions increase from the Proposed Action would occur from mobile sources which are not governed by Titles I and V; therefore, the requirements originating from Titles I and IV are not considered further.

3.4.1.2 Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere helps regulate the earth's temperature and are believed to contribute to global climate change. GHGs include water vapor, carbon dioxide (CO_2), methane, nitrous oxide, O_3, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface. The GWP of a particular gas provides a relative basis for calculating its carbon dioxide equivalent (CO_2e) or the amount of CO_2e to the emissions of that gas. CO_2 has a GWP of 1 and is, therefore, the standard by which all other GHGs are measured. Potential impacts associated with GHG emissions are discussed in **Section 4.3**.

In Virginia, the USEPA regulates GHG primarily through a permitting program known as the GHG Tailoring Rule. This rule applies to GHG emissions from stationary sources. As virtually all of the emissions increase from the Proposed Action would occur from mobile sources, this rule would not apply here. As such, this rule is not discussed further.

In addition to the GHG Tailoring Rule in 2009, the USEPA promulgated a rule requiring sources to report their GHG emissions if they emit more than 25,000 metric tons or more of CO_2e per year (40 CFR § 98.2[a][2]). Again, this only applies to stationary sources of emissions.

3.4.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

3.4.2.1 Regional Climate

The regional climate of southeast Virginia, where JBLE-Langley is located, is classified as a humid subtropical climate which is characterized by mild winters and hot humid summers. The warmest month in the region is July, with average high and low temperatures of 89 degrees Fahrenheit (°F) and 73°F, respectively. January is the coldest month with an average high temperature of 50°F and average low temperature of 34°F. The wettest month by average precipitation is July with an average of 5.1 inches (in.) of rain. The driest month is February with an average of 3.1 in. of precipitation (US Climate Data, 2018a, 2018b). Summers are characterized by frequent thunderstorms and winters are impacted by midlatitude cyclones. The most intense of these cyclones are referred to as nor'easters and can result in high winds, heavy rain, and snow. Tropical cyclones affect the region about once per year during the summer and fall months. Hurricanes have an impact about every 2 to 3 years (Roth and Cobb, 2001).

3.4.2.2 Baseline Air Emissions

The VDEQ has adopted the NAAQS, thereby requiring the use of the standards within the Commonwealth of Virginia (9VAC5 Chapter 30).

JBLE-Langley is located in the Hampton Roads Intrastate AQCR. Each AQCR has regulatory areas that are designated as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant.

Norfolk-Virginia Beach-Newport News (Hampton Roads), Virginia, (also referred to as the "Area") is designated attainment for all criteria pollutants except the 1997 8-hour ozone NAAQS, for which the Area is a maintenance area. The Area was designated as marginal nonattainment for the 0.080 parts per billion 1997 8-hour ozone NAAQS on 15 April 2004 (69 FR 23857, 30 April 2004). The Area, after attaining the standard, was redesignated to attainment effective 28 July 1997 (62 FR 34408, 26 June 1997). At that time, the USEPA approved the state's proposed plan to maintain the standard for at least the next 10 years. Thus, the Hampton Roads Area was applicable under the section 176(c) CAA conformity requirement as a maintenance area for the 1997 ozone NAAQS. Regardless of whether the state submitted a maintenance plan to cover a full 20 years following redesignation to attainment or not, the

Hampton Roads Area would remain a maintenance area for purposes of the CAA conformity until 28 July 2027; however, in the subsequent promulgation and implementation of the 2008 8-hour ozone NAAQS in 2015, (80 FR 12264, 6 March 2015), the Hampton Roads Area was designated attainment. In the same rule, the USEPA revoked the 1997 ozone NAAQS stating areas designated attainment for the 2008 ozone NAAQS would no longer be subject to the CAA conformity requirement even though they were nonattainment or maintenance areas for the 1997 ozone NAAQS.

Litigation ensued under South Coast Air Quality Management District v. USEPA (Case No. 15-1115) challenging this and other elements of the final rule. The Circuit Court of Appeals for the District of Columbia, referring to such 1997 ozone areas as "orphan areas," held that the USEPA did not have the authority to waive the conformity requirements that would otherwise apply to the 1997 ozone orphan maintenance areas. Further, the court said the USEPA lacked authority to revoke transportation conformity for orphan maintenance areas, stating nothing with respect to general conformity; therefore, because the 16 February 2018 District of Columbia Circuit decision in South Coast v. USEPA is ambiguous with regard to whether the court's holdings on transportation conformity requirements for 1997 ozone orphan areas also apply to general conformity, each federal agency is advised to make its own decision about whether general conformity applies to their projects. As such, the Air Force is taking the position that the General Conformity rule is applicable to the Hampton Roads Area. As a result, air emissions for the Proposed Action were compared against the conformity applicability thresholds.

Overall, VDEQ 10-year monitoring data show in general that criteria pollutant emission concentrations of CO, SO_2, NO_x, and ozone have been decreasing since 2005 (Virginia Department of Transportation, 2016). The reductions are believed to be the result of emission control measures that have been implemented over the past two decades. These measures targeted motor vehicle engines, gas stations, the consumer products industry, and power plants.

JBLE-Langley is not classified a major source for PSD and is not located within 10 km of any of the 156 USEPA-designated Class I areas protected by the Regional Haze Rule. Thus, the project requires no analysis with respect to the PSD requirements under 40 CFR § 51.166. As the area is not nonattainment for any criteria pollutant, the project requires no analysis with respect to the nonattainment-New Source Review requirements under 40 CFR § 51.165.

JBLE-Langley operates under a Stationary Source Operating Permit which limits emissions for each criteria pollutant to less than 100 tpy. As shown in **Table 3-8**, JBLE-Langley stationary sources account for less than 0.025 percent of criterial pollutant emissions in Virginia and regionally less than 0.27 percent of criteria pollutant emissions.

Table 3-8
Joint Base Langley-Eustis, Langley Air Force Base Stationary Source Emission Summary

	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC
Langley AFB[1] (tpy)	8.42	15.05	1.12	0.90	0.73	6.34
Statewide[1, 2] (tpy)	34,562	52,353	12,041	6,099	33,831	26,604
Tidewater Region[1, 2, 3] (tpy)	3,380	5,707	1,512	351	4,975	3,623
Percent of State Emissions	0.024	0.029	0.009	0.015	0.002	0.027
Percent of Tidewater Region Emissions	0.249	0.264	0.074	0.257	0.015	0.175

Notes:
[1] VDEQ 2016 Annual Point Source Criteria Pollutant Emission Inventory Data.
[2] Emissions reported are from permitted sources, thus total Virginia and Tidewater Region pollutant emissions are higher due to the contribution from smaller unpermitted sources.
[3] Tidewater Region includes the counties of Accomack, Isle of Wight, James City, Northampton, Southampton and York; and the cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg.

Mobile sources, such as vehicle and aircraft emissions, are generally not regulated *under permitting requirements* and are not covered under existing stationary source permitting requirements. Previous mobile source inventory data for JBLE-Langley covering vehicles and AGE equipment indicated the following emissions: CO = 29 tpy, NO_x = 20.6 tpy, PM = 4.2 tpy, and VOC = 4.7 tpy.

An Air Conformity Applicability Analysis is discussed in **Section 4.3**. **Appendix C** provides an overview of the CAA and the Commonwealth of Virginia air quality regulations as well as assumptions used for the air quality analysis and a Draft Record of Nonapplicability (RONA), General Conformity Record of Nonapplicability. The RONA documents that an air conformity applicability analysis is not required for this project at this time.

3.4.3 *Existing Conditions – Airspace*

3.4.3.1 Regional Climate

The airspace ROI, comprised of W-386, W-122, and W-72, is affected by many of the same features that affect the nearby land areas. Because of the influence of the ocean, the diurnal temperature range in the airspace is less than that found over nearby land areas. Average high temperatures are lower and average low temperatures are higher. Many of the same weather features that affect the land areas impact the airspace, including summer thunderstorms, winter nor'easters, and infrequent tropical cyclones.

3.4.3.2 Baseline Emissions

There are no known sources of emissions that exist in the Warning Areas, and there are no Class 1 areas within 10 mi of the Warning Areas. State jurisdiction with respect to meeting NAAQS extends to the state seaward boundary (3 mi). The Warning Areas fall outside the 3-mi boundary. Thus, no analysis was prepared for the offshore jurisdictional waters because there are no surface-based operations proposed for that area that would cause project-related emissions.

Under 40 CFR Part 55, permitting and other air quality requirements apply to facilities beyond state seaward boundaries. Within 25 NM of the state seaward boundary, facilities must comply with the air quality regulations of the nearest onshore area. Beyond 25 NM from the state seaward boundary, facilities are subject to federal requirements including the PSD preconstruction permit program and the Title V operating permit program; however, these programs apply only to stationary sources and thus would not be applicable to the proposed contract ADAIR operations in the Warning Areas.

3.5 BIOLOGICAL RESOURCES

3.5.1 *Definition of the Resources*

Biological resources include native or invasive plants and animals; sensitive and protected floral and faunal species; and the habitats, such as wetlands, forests, and grasslands, in which they exist. Habitat can be defined as the resources and conditions in an area that support a defined suite of organisms. The following is a description of the primary federal statutes that form the regulatory framework for the evaluation of biological resources.

The ROI for biological resources on JBLE-Langley includes the land surrounding the facilities proposed for use, the land within the airfield noise contours and safety zones (see **Figures 3-4** and **3-5**), and Warning Areas W-386, W-122, and W-72 (see **Figure 1-4**).

3.5.1.1 Endangered Species Act

The ESA of 1973 (16 U.S.C. § 1531 et seq.) established protection over and conservation of threatened and endangered species and the ecosystems upon which they depend. Sensitive and protected biological resources include plant and animal species listed as threatened, endangered, or special status by the USFWS and NMFS. Under the ESA (16 U.S.C. § 1536), an “endangered species” is defined as any species in danger of extinction throughout all, or a large portion, of its range. A “threatened species” is defined as any species likely to become an endangered species in the foreseeable future. The USFWS maintains a list of species considered to be candidates for possible listing under the ESA. The ESA also allows the designation of geographic areas as critical habitat for threatened or endangered species. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA. Section 9 of the ESA prohibits the take of federally listed species. “Take” as defined under the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”

3.5.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 makes it unlawful for anyone to take migratory birds or their parts, nests, or eggs unless permitted to do so by regulations. Per the MBTA, “take” is defined as to “pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 CFR § 10.12). Migratory birds include nearly all species in the United States, with the exception of some upland game birds and nonnative species.

EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires all federal agencies undertaking activities that may negatively impact migratory birds to follow a prescribed set of actions to further implement the MBTA. EO 13186 directs federal agencies to develop a Memorandum of Understanding (MOU) with the USFWS that promotes the conservation of migratory birds. On 5 September 2014, the DOD signed a 5-year MOU with the USFWS. In accordance with the MOU, and to the extent possible as per law and budgetary considerations, EO 13186 encourages agencies to implement a series of conservation measures aimed at reinforcing and strengthening the MBTA.

The National Defense Authorization Act for Fiscal Year 2003 (Public Law 107-314, 116 Stat. 2458) provided the Secretary of the Interior the authority to prescribe regulations to exempt the armed forces from the incidental take of migratory birds during authorized military readiness activities. Congress defined military readiness activities as all training and operations of the US armed forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.

In December 2017, the US Department of the Interior issued M-Opinion 37050 which concluded that the take of migratory birds from an activity is not prohibited by the MBTA when the underlying purpose of that activity is not the take of a migratory bird. The USFWS interprets the M-Opinion to mean that the MBTA’s prohibition on take does not apply when the take of birds, eggs, or nests occurs as a result of an activity, the purpose of which is not to take birds, eggs, or nests.

3.5.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. § 668-668c) prohibits the “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*), alive or dead, or any part, nest, or egg thereof.” “Take” is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb," and “disturb” is defined as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, injury to an eagle, a decrease in productivity by substantially interfering with the eagle’s normal breeding, feeding or sheltering behavior, or nest abandonment by substantially interfering with the eagle’s normal breeding, feeding or sheltering behavior.” The Bald and Golden Eagle Protection Act also prohibits activities around an active or inactive nest site that could result in an adverse impact on the eagle.

3.5.1.4 Wetlands

The CWA of 1972 (33 U.S.C. § 1251 et seq.) regulates discharges of pollutants in surface waters of the United States. Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. The US Army Corps of Engineers (USACE) defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions” (Environmental Laboratory, 1987). Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR Part 328).

3.5.1.5 Marine Mammal Protection Act

The MMPA of 1972 (16 U.S.C Chapter 31) protects all marine mammals: dugongs (*Dugong dugon*) and manatees (*Trichechus* spp.), cetaceans (dolphins, porpoises, and whales), pinnipeds (seals, sea lions, and walruses), polar bears (*Ursus maritimus*), marine otters (*Lutra felina*), and sea otters (*Enhydra lutris*). The MMPA prohibits the "take" of marine mammals in US waters and by US citizens on the high seas, as well as the importation of marine mammals and marine mammal products into the US. “Take” is defined under the MMPA as “to hunt, harass, capture, or kill” any marine mammal or attempt to do so. The NMFS administers the MMPA in protecting dolphins, porpoises, seals, sea lions, and whales. USFWS administers the MMPA for the protection of dugongs, manatees, walruses, otters, and polar bears. Military readiness activities are not subject to the MMPA provisions of harassment. The “specified geographic area” requirement and the small numbers provision do not apply to military readiness activities or scientific research activities conducted by or on behalf of the federal government.

3.5.1.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. § 1801 et seq.) and amended by the Sustainable Fisheries Act in 1996, requires the identification and conservation of Essential Fish Habitat. Essential Fish Habitat includes those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. This can include areas that were historically used by fish. Federal agencies are required to consult with NMFS and prepare an Essential Fish Habitat Assessment if potential adverse effects on Essential Fish Habitat are anticipated from the Proposed Action.

3.5.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

The information presented in this section was gathered from the *JBLE-Langley and Big Bethel Reservoir Integrated Natural Resources Management Plan* (INRMP; JBLE-Langley, 2014), the *JBLE-Langley 2017 Integrated Natural Resources Management Plan (INRMP) Annual Review Letter Summary Report* (JBLE-Langley, 2017a), and the *Draft Atlantic Fleet Testing and Training Environmental Impact Statement/ Overseas Environmental Impact Statement* (US Navy, 2017). Data were also gathered from the USFWS, NMFS, and Virginia Department of Game and Inland Fisheries (VDGIF).

3.5.2.1 Regional Biological Setting

Vegetation and Wildlife

The majority of JBLE-Langley consists of managed lawns and landscaped areas surrounding residential and industrial development. Only approximately 230 ac of JBLE-Langley is second-growth forest, dominated by either pine (*Pinus* spp.) or sweet gum (*Liquidambar styriciflua*), and is characteristic of old field succession and growth that has occurred since the establishment of the federal use of the lands. The wooded areas contain little forest products of marketable size, quantity, or quality. The only forested areas on base with marketable forest products is a 12-ac reforested stand of loblolly pine (*Pinus taeda*), abutting the perimeter road near the NASA taxiway in the northwestern part of the installation and an 18.5-ac loblolly pine tract east of the Eaglewood Golf Course. In the northwestern part of JBLE-Langley,

there are approximately 72 ac of mixed hardwoods and pine on either side of the Gray Road extension of Worley Road (JBLE-Langley, 2014).

Wildlife species on JBLE-Langley are habitat generalists and tolerant of disturbance. The only game animals hunted on JBLE-Langley are the white-tailed deer (*Odocoileus virginianu*s) and wild turkey (*Meleagris gallapavo*). Native mammals that have been observed at JBLE-Langley include white-tailed deer, raccoon (*Procyon lotor*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), gray squirrel (*Scivrus carolinensis*), fox squirrel (*Scivrus niger*), Virginia opossum (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), meadow vole (*Microtus pennsylvanicus*), river otter (*Lantra canadensis*), and various species of small rodents. Reptiles that have been observed include the six-lined racerunner (*Cinemidophorus sexlineatus*), eastern hognose snake (*Heterodon platirhinos*), black racer (*Coluber constrictor*), canebrake rattlesnake (*Crotalus horidus*), diamondback terrapin (*Malaclemys terrapin*), and the black rat snake (*Elaphe obsolete*) (JBLE-Langley, 2014).

Airfield bird surveys have been conducted by Wildlife Services since 2000; volunteer bird enthusiasts have participated in the annual National Audubon Christmas bird count at JBLE-Langley; and Patuxent Wildlife Research Center breeding bird survey programs have included JBLE-Langley. More than 150 species of birds have been observed on or near JBLE-Langley during these surveys (JBLE-Langley, 2014). Songbirds and perching birds observed include savannah sparrow (*Passerculus sandwichensis*), blue jay (*Cyanocitta crista*), American crow (*Corvus brachyrhynchos*), northern cardinal (*Cardinallis cardinalis*), Carolina wren (*Thyothorus ludovicianus*), pine warbler (*Dendroica pinus*), northern parula (*Parula americana*), indigo bunting (*Passerine cyane*a), ruby-throated hummingbird (*Archilochus colubris*), eastern meadowlark (*Sturnella magna*), American goldfinch (*Spinus tristis*), yellow-throated warbler (*Dendrioca dominicia*), belted kingfisher (*Megaceryle alcyon*), and eastern kingbird (*Tyrannus tyrannus*). Shorebirds observed include black-bellied plovers (*Pluvialis squatarola*), semipalmated plover (*Charadrius semipalmatus*), American oystercatcher (*Haematopus palliates*), greater yellowlegs (*Tringa melanoleuca*), willet (*Catoptrophorus semipalmatus*), upland sandpiper (*Bartramia longicauda*), sanderling (*Calidris alba*), dunlin (*Calidris alpine*), Baird's sandpiper (*Calidris bairdii*), common snipe (*Gallinago gallinago*), yellow-crowned night heron (*Nyctanassa violacea*), laughing gull (*Larus atricilla*), ring-billed gull (*Larus delawarensis*), brown pelican (*Pelecanus occidentalis*), common tern (*Sterna hirundo*), and least turn (*Sterna antillarum*). Waterfowl seen include canvasbacks (*Aythya valisineria*), ruddy ducks (*Oxyura jamaicensis*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), bufflehead (*Bucephala islandica*), common golden-eye (*Bucephala clangula*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), double-crested cormorant (*Phalacroorax autitus*), common merganser (*Mergus merganser*), horned grebe (*Podiceps auritus*), and pied-billed grebe (*Podilymbus podiceps*). Characteristic game birds include wild turkey, northern bobwhite (*Colinus virginianu*s), and mourning dove (*Zenaida macroura*). Red-tailed hawks (*Buteo jamaicensus*), Cooper's hawk (*Accipter cooperii*), great horned owls (*Bubo virginanus*), and American kestrel (*Falco sparverius*) are raptors that are considered year-round residents (JBLE-Langley, 2014).

Observed breeding birds have included American robin (*Turdus migratorius*), Carolina wren, barn swallow (*Hirundo rustica*), tufted titmouse (*Baeolophus bicolor*) Carolina chickadee (*Phalacrocorax autris*), eastern bluebird (*Sialia sialis)*, brown-headed nuthatch (*Sitta pusilla*), red-bellied woodpecker (*Melanerpes carolinus*), northern mockingbird (*Mimus polyglottos*), red-winged blackbird (*Agelaius phoeniceu*s), bald eagle (*Haliaeetus leucocephalsu*), barn owls (*Tyto alba*), killdeer (*Charadrius vociferous*), and wood thrush (*Hylocichla mustelina*) (JBLE-Langley, 2014).

Nests counts are conducted annually for osprey (*Pandion haliaetus*), bald eagles, herons, and egrets (JBLE-Langley, 2017a). Habitat suitable for osprey and eagle foraging, roosting, and/or nesting occur along the 9.9 mi of Chesapeake Bay shoreline bordering JBLE-Langley. From 15 March through 15 September 2017, eight active osprey nests were observed on JBLE-Langley and in the Back River. Habitat suitable for bald eagle foraging, roosting, and/or nesting occurs among the loblolly pines on the northern side of the base. The bald eagle population that breeds in Virginia has successfully recovered. Recent surveys indicate that foraging by bald eagles occurred to a limited extent within creeks and marshes of JBLE-Langley and on the reservoir. The uniform age/size structure of loblolly pine stands may limit the use of the base as nesting or roosting habitat (JBLE-Langley 2014).

Fish commonly found in the estuarine waters surrounding JBLE-Langley include broad stripe anchovy (*Anchoa hepsetus*), bay anchovy (*Anchoa mitchilli*), silver perch (*Bairdiella chrysoura*), spotted sea trout (*Cynoscion nebulosus*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), Atlantic menhaden (*Brevoorita tyranmus*), gizzard shad (*Dorosoma cepedianum*), sheepshead minnow (*Cyprinidon variegates*), mummichog (*Fundulus heteroclitus*), striped killifish (*Fundulus majaalis*), naked goby (*Gobiosomoa bosci*), Atlantic silverside (*Menidia menidia*), striped bass (*Morone saxatilis*), white mullet (*Mugil curema*), pigfish (*Orthaopristis chrysoptera*), summer flounder (*Paralichthys dentatus*), Atlantic needlefish (*Strongylura notate*), and inshore lizardfish (*Synidus foetus*). Blue crab (*Callinetes sapidus*) is also commonly found in tidal waters around the installation (JBLE-Langley, 2014).

Invasive Species

At JBLE-Langley, the primary invasive species of concern are phragmites (*Phragmites* spp.) and European starlings (*Sturnus vulgaris*). Phragmites control began as a joint agency project in October 2002, with the application of an isopropylamine salt of glyphosate. Aerial application was accomplished via helicopter in the tidal wetland areas of JBLE-Langley in 2002 (150 ac), 2005 (157 ac), 2007 (104 ac), and 2008 (114 ac). Aerial application treatments were suspended in 2009 until adequate funding could be obligated towards the program. Manual application treatments continue in developed and natural areas (where possible) by 633d Civil Engineer Squadron (633 CES)/CEIE (Environmental Element) and at Environmental Restoration Program (ERP) sites via contract.

According to the Invasive Species Inventory and Management Plan for JBLE-Langley, three other dominant invasive plant species were identified on JBLE-Langley (JBLE-Langley, 2014). Based on total occupied acreage, these include Japanese honeysuckle (*Lonicera japonica*) (108.44 ac), followed by Japanese stilt grass (*Microstegium vimineum*) (41.13 ac), and privet (*Ligustrum* spp., 23.16 ac). The management areas with the most coverage of invasive plant species were the NW Airfield (51.96 ac) and NE Airfield (45.13 ac), with Japanese honeysuckle comprising the vast majority of that area. Other management areas with significant invasive species presence were MASH (31.04 ac), SW Worley (17.58 ac), West Approach (8.9 ac), Langley Family Housing central (8.71 ac), and Poplar Road Pines (7.59 ac) (JBLE-Langley, 2014).

Threatened and Endangered Species and/or Species of Concern

A list of species that could potentially occur in the ROI was obtained from the USFWS Information for Planning and Consultation website, NMFS Listed Species Lists and Section 7 Species Mapper, and VDGIF, and is provided in **Table 3-9.** Federal and state listed species with the potential to occur in or near JBLE-Langley and the Warning Areas are summarized in **Appendix D**.

There are no documented threatened or endangered species currently nesting, roosting, or living on JBLE-Langley; however, the Air Force recognizes the possibility of an incidental occurrence of a listed species occurrence resulting from foraging or flyover.

There is no suitable nesting or foraging habitat on JBLE-Langley for the federally listed red-cockaded woodpecker (*Picoides borealis*), piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), Bermuda petrel (*Pterodroma cahow*), or roseate tern (*Sterna dougallii*). The red-cockaded woodpecker occurs in mature longleaf pine-dominated or mature loblolly pine-dominated forests. The piping plover is associated with sandy beaches for roosting and expansive sand and mud flats for foraging which are both absent from JBLE-Langley. Further, federally listed sea turtles have the potential to occur in near JBLE-Langley in the Chesapeake Bay as well as in the Warning Areas but are not known to live or nest on JBLE-Langley. The federally threatened northern long-eared bat (*Myotis septentrionalis*) occurs in cavities or crevices of large live and dead trees during the summer and spend winter hibernating in caves and mines (USFWS, 2018b). No winter hibernacula is present on JBLE-Langley and no summer roosts have been observed on Base. No northern long-eared bats have been noted during formal acoustic surveys (JBLE-Langley, 2017a). The federally threatened northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) has no record of occurrence on JBLE-Langley. This beetle typically inhabits broad sandy beaches, which are not

Table 3-9
Federal and State Listed Species with the Potential to Occur in or near Joint Base Langley-Eustis, Langley Air Force Base and the Warning Areas

Species	Federal Status[1]	Virginia State Status[2]	JBLE-Langley	Warning Areas
Birds				
Eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*)	Proposed Threatened	Endangered	X	
Red-cockaded woodpecker (*Picoides* [= *Dendrocopos*] *borealis*)	Endangered	Endangered	X	
Bermuda petrel (*Pterodroma cahow*)	Endangered	-		X
Piping plover *(Charadrius melodus)*	Threatened	Threatened	X	
Red knot (*Calidris canutus rufa*)	Threatened	Threatened		X
Roseate tern (*Sterna dougallii*)	Threatened	-		X
Loggerhead shrike (*Lanius ludovicianus*)	Sensitive	Threatened	X	
Peregrine falcon (*Falco peregrinus*)	-	Threatened	X	
Upland sandpiper (*Bartramia longicauda)*	-	Threatened	X	
Gull-billed tern (*Sterna nilotica*i)	-	Threatened	X	
Mammals				
Blue whale (*Balaenoptera musculus*)	Endangered	Endangered		X
Fin whale (*Balaenoptera physalus*)	Endangered	Endangered		X
North Atlantic right whale (*Eubalaena glacialis*)	Endangered	Endangered		X
Sei whale (*Balaenoptera boreali*)	Endangered	Endangered		X
Sperm whale (*Physeter microcephalus*)	Endangered	Endangered		X
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	-	X	
Reptiles				
Kemp's (= Atlantic) Ridley turtle (*Lepidochelys kempii*)	Endangered	Endangered	X	X
Hawksbill turtle (*Eretmochelys imbricata*)	Endangered	Endangered		X
Leatherback turtle (*Dermochelys coriacea*)	Endangered	Endangered	X	X
Loggerhead turtle (*Caretta caretta*)	Threatened	Threatened	X	X
Green turtle (*Chelonia mydas*)	Threatened	Threatened	X	X
Canebrake rattlesnake (*Crotalus horridus*)	-	Endangered	X	

Table 3-9
Federal and State Listed Species with the Potential to Occur in or near Joint Base Langley-Eustis, Langley Air Force Base and the Warning Areas

Species	Federal Status[1]	Virginia State Status[2]	JBLE-Langley	Warning Areas
Amphibians				
Eastern tiger salamander (*Ambystoma tigrinum*)	-	Endangered	X	
Mabee's salamander (*Ambystoma mabeei*)	-	Threatened	X	
Barking treefrog (*Hyla gratiosa*)	-	Threatened	X	
Fish				
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	Endangered	Endangered	X	X
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	Endangered	X	
Plants				
Harper's fimbristylis (*Fimbristylis perpusilla*)	-	Endangered	X	
Insects				
Northeastern beach tiger beetle *(Cicindela dorsalis dorsalis*)	Threatened	Threatened	X	

Source:
[1] USFWS, 2018a
[2] VDGIF, 2018

Notes:
JBLE-Langley = Joint Base Langley-Eustis, Langley Air Force Base

present at JBLE-Langley and has become a species of concern within the Chesapeake Bay ecosystem (JBLE-Langley, 2014). The federally proposed threatened eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*) could be present in coastal marshes on and near JBLE-Langley; however, this species is a small secretive bird, is limited to areas with dense wetland vegetation, does not readily take flight where it would interact with aircraft movement, and would not be present near the airfield. The federally and state endangered Atlantic (*Acipenser oxyrinchus oxyrinchus*) and shortnose (*Acipenser brevirostrum*) sturgeons are known to occur in waters of the Chesapeake Bay and rivers that are tributaries to the Chesapeake Bay.

Three species listed as state endangered and are known from the vicinity of JBLE-Langley are Harper's fimbristylis (*Fimbristylis perpusilla*), canebrake rattlesnake, and the eastern tiger salamander (*Ambystoma tigrinum*). The Harper's fimbristylis is a small herb, producing clustered flowers from August to September, and a pale-brown, banana-shaped fruit in September to October. Coastal seasonal ponds provide habitat for this plant. The canebrake rattlesnake, a large snake that inhabits hardwood and mixed hardwood-pine forests, herbaceous fields, and the ridges and glades of swampy areas. It overwinters on JBLE-Langley in hollow trees or in stumps. The eastern tiger salamander spends most of its life belowground. The adults are terrestrial and inhabit any type of woodland or marshy grassland. The larvae and aquatic juveniles hide in vegetation or bottom debris in ponds where they are hatched (JBLE-Langley, 2014).

The Bermuda petrel is a ground-nesting seabird that forages over the Atlantic Ocean. The roseate tern nests on sandy or rocky islands and forages in shallow bays and estuaries; however, there is no suitable nesting or foraging habitat for these two bird species on or near JBLE-Langley. Suitable foraging habitat does occur in the Warning Areas, and these species are discussed in more detail in **Section 3.5.3.1**.

Potential state-threatened amphibians that could occur on JBLE-Langley include the barking tree frog (*Hyla gratiosa*) and the Mabee's salamander (*Ambystoma mabeei*). Both of these amphibians breed in

fish-free freshwater ponds. Ephemeral wetlands are most satisfactory as they are least likely to contain fish or good populations of predacious insects. Breeding does not occur in years when wetlands either fail to form or dry early due to drought or abnormal patterns of precipitation. The loss of natural freshwater wetlands or degradation of wetlands due to human activities is a substantial problem for these two species. None have been documented at JBLE-Langley (JBLE-Langley, 2014).

Birds that are listed as state threatened include the peregrine falcon (*Falco peregrinus*; delisted from the federal endangered species list), upland sandpiper, gull-billed tern (*Sterna nilotica*), and loggerhead shrike (*Lanius ludovicianus*), including the migrant subspecies. JBLE-Langley may be used by these bird species for foraging or roosting, but none are known to nest on the base (JBLE-Langley, 2014).

3.5.2.2 Wetlands

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat detention, and erosion protection. Wetlands are protected as a subset of the "the waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and besides navigable waters, incorporates deep-water aquatic habitats and wetlands. Section 404(b)(1) of the CWA directs the USEPA to develop guidelines for the placement of dredged or fill material (33 U.S.C. § 1341[b]). These guidelines developed by USEPA are known as the "404(b)(1) Guidelines" and are located at 40 CFR Part 230. The stated purpose of the Guidelines is to "restore and maintain the chemical, physical, and biological integrity of waters of the US through the control of discharges of dredged or fill material" (40 CFR § 230.1[a]). In Virginia, activities occurring within a wetland are regulated by both the VDEQ and the USACE.

The latest wetlands delineation for JBLE-Langley was accomplished by USACE in February 2013. The delineation classified JBLE-Langley's wetlands following the Cowardin classification system (Cowardin et al., 1979). Jurisdictional wetlands are those wetlands subject to regulatory protection under Section 404 of the CWA. Wetlands at JBLE-Langley, classified as jurisdictional by the USACE, encompass approximately 652 ac, of which 462 ac are nonfreshwater estuarine wetlands. Most of the wetlands are associated with Tabbs Creek, Tide Mill Creek, and their tributaries. Established forested wetlands were identified in the northwest section of the base, and isolated palustrine emergent wetlands were identified throughout the flightline area. In 2001, IT Corporation identified 10 distinct wetland communities within the confines of the base (JBLE-Langley, 2014).

3.5.3 *Existing Conditions – Airspace*

The information presented in this section was gathered from the JBLE-Langley INRMP (JBLE-Langley, 2014), the JBLE-Langley INRMP Summary Report (JBLE-Langley, 2017a), and the *Draft Atlantic Fleet Testing and Training Environmental Impact Statement/Overseas Environmental Impact Statement* (US Navy, 2017). Data were also gathered from the USFWS, NMFS, and VDGIF.

3.5.3.1 Regional Biological Setting

The Warning Areas include offshore waters off the coasts of Delaware, Maryland, Virginia, and North Carolina. The Warning Areas are located in the southern portion of the Mid-Atlantic Bight, extending from 3 to 155 NM offshore. Water depths extend to over 13,000 ft deep. The Warning Areas include the continental shelf, continental slope, and various submarine canyons. The average depth of the continental shelf is 246 ft and has an approximate gradient of 1:1,000. The continental shelf breaks eastward at the continental slope, which has an approximate gradient of 1:10. The water depth along the continental slope averages between 6,500 and 13,000 ft. Various large submarine canyons dissect the continental slope and become deep sea channels along the continental rise (US Navy, 2009).

The sediments in the Warning Areas are typical of the Mid-Atlantic Bight continental shelf and slope, consisting of fine quartz sand with a patchy veneer of shells. The sediment texture is primarily medium

sands (US Navy, 2009). A general description of the marine species, which includes fish, sea turtles, and marine mammals, that can occur in the Warning Areas is provided. The descriptions for sea turtles are provided in **Section 3.5.2.1**, as all sea turtles are listed under the ESA.

Plankton. Plankton are organisms that move with the ocean's currents and cannot maintain independent movement against water currents. Plankton include phytoplankton, which are plant-like organisms including algae, zooplankton, which are animals including fish eggs and larvae, and bacterioplankton, which are comprised of bacteria. Phytoplankton are critical to marine food webs. Phytoplankton are most commonly found in surface waters and in nearshore environments where nutrients and sunlight are more plentiful. Phytoplankton concentrations generally decrease with the distance from shore and become less prevalent in the deeper waters of the continental slope.

The eggs and larvae of fish, which comprise a large portion of zooplankton in the marine environment, are typically found in the upper 650 ft of the ocean water column. As fish larvae mature, their motility increases, and they feed on phytoplankton and smaller zooplankton. The combination of phytoplankton and the smaller zooplankton concentrations are critical to supporting fisheries health and abundance (US Navy, 2017).

Benthic Organisms. Benthic organisms are bottom-dwelling animals that live on and within the marine sediments. These include crustaceans, echinoderms, anthozoans, annelids, mollusks, and ground fish. Some benthic organisms burrow into soft bottoms while other attach themselves to hard structure located on the ocean floor. Most of the Warning Areas are comprised of soft bottoms and the benthic organisms present in these areas include polychaete and archiannellid worms, bivalves, amphipods, and asteroids (US Navy, 2017).

Hard bottom structure in the Warning Areas includes rock outcrops, hard structure from fossil remains, artificial reefs, and shipwrecks that could support benthic invertebrates, such as bryozoans, hard and soft corals, hydroids, anemones, encrusting algae, and sponges. These hard structure areas also support foraging sea turtles and commercial/recreational fishes. Within the Warning Areas, there are isolated patches of temperate soft and hard corals, hydroids, zoanthids, and sponges that colonize rock outcroppings, artificial reefs, and shipwrecks. The southern portion of the Warning Areas has greater concentrations of midshelf and deepwater corals and sponges due to the warmer water temperatures and greater area of hard structure (US Navy, 2009).

Fish. Fish species vary greatly with depth of water, salinity, distance from shore, clarity of the water, availability of structure, and availability of prey. The upper 650 ft of the ocean is the epipelagic zone where there is sufficient sunlight penetration to support phytoplankton while the portion of the ocean's water column between 650 ft and 3,200 ft is the mesopelagic zone where light penetration is minimal. Sunlight does not penetrate below the mesopelagic zone (Moyle and Cech, 2004). Most fish in the ocean occur in the epipelagic zone and those associated with the nearshore environment are the most commercially valuable. Fish species of greatest interest in the nearshore environment include gobies (Gobiidae), drums (Sciaenidae), seabasses (Serranidae), groupers (Epinephelidae), snappers (Lutjanidae), and sculpins (Cottidae) associated with hard bottom habitat and white flounder (Bothidae and Paralichthyidae) and stingrays (Dasyatidae) associated with soft bottom habitat. Tunas (Scombridae), salmon (Salmonidae), billfishes and swordfishes (Xiphiidae), sharks (Carcharhinidae), sauries (Scomberesocidae), and ocean sunfish (Molidae) are ocean epipelagic fish that could occur in the Warning Areas (US Navy, 2017).

Marine Mammals. There are 33 cetacean species and three pinniped species that could occur within the Warning Areas (**Table 3-10**). Some cetacean species are resident year-round while others occur seasonally as they migrate through the area. All three pinniped species would be unlikely to occur in the Warning Areas but could be rare visitors to the western (shallower) portions of the Warning Areas in winter and spring.

Table 3-10
Marine Mammals with the Potential to Occur in Warning Areas W-386, W-122, and W-72

Common Name	Scientific Name	Endangered Species Act Listing	Occurrence in the Warning Areas[1]
Cetaceans			
North Atlantic right whale	*Eubalaena glacialis*	Endangered	Occurs during fall, winter, and spring, with occasional summer sightings.
Humpback whale	*Megaptera novaeangliae*	-	Occurs during migration in the fall, winter, and spring.
Minke whale	*Balaenoptera acutorostrata*	-	Occurs in waters over the continental shelf year-round.
Bryde's whale	*Balaenoptera brydei*	-	Occurs year-round.
Sei whale	*Balaenoptera boreali*	Endangered	Occurs in deep waters year-round.
Finback whale	*Balaenoptera physalus*	Endangered	Occurs year-round and is the most commonly sighted large whale in the winter in the Warning Areas.
Blue whale	*Balaenoptera musculus*	Endangered	May occur at any time of the year, but less frequent in summer.
Sperm whale	*Physeter macrocephalus*	Endangered	Occurs year-round in deep waters.
Pygmy sperm whale	*Kogia breviceps*	-	Occurs year-round.
Dwarf sperm whale	*Kogia sima*	-	Occurs year-round.
Cuvier's beaked whale	*Ziphius cavirostris*	-	Occurs over the continental slope year-round.
True's beaked whale	*Mesoplodon mirus*	-	Occurs over the continental slope year-round.
Gervais' beaked whale	*Mesoplodon europaeus*	-	Occurs over the continental slope year-round.
Sowerby's beaked whale	*Mesoplodon bidens*	-	Occurs over the continental slope year-round.
Blainville's beaked whale	*Mesoplodon densirostris*	-	Occurs over the continental slope year-round.
Rough-toothed dolphin	*Steno bredanensis*	-	Occurs in waters over the continental slope year-round.
Bottlenose dolphin	*Tursiops truncatus*	-	Occurs in waters over the continental shelf year-round.
Pantropical spotted dolphin	*Stenella attenuata*	-	Occurs in waters over the continental slope i year-round.
Atlantic spotted dolphin	*Stenella frontalis*	-	Year-round occurrences.
Spinner dolphin	*Stenella longirostris*	-	Occurs in deep warm waters year-round.
Clymene dolphin	*Stenella clymene*	-	Occurs year-round in the deep warmer waters.
Striped dolphin	*Stenella coeruleoalba*	-	Occurs in waters over the continental slope from the continental break eastward year-round.

Table 3-10
Marine Mammals with the Potential to Occur in Warning Areas W-386, W-122, and W-72

Common Name	Scientific Name	Endangered Species Act Listing	Occurrence in the Warning Areas[1]
Cetaceans			
Common dolphin	*Delphinus delphis*	-	Occurs in waters over the continental shelf year-round.
Fraser's dolphin	*Lagenodelphis hosei*	-	Likely rare; however, there is the potential to occur year-round.
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	-	Primarily in waters over the continental shelf and occurs year-round.
Risso's dolphin	*Grampus griseus*	-	Occurs along the continental shelf break year-round.
Melon-headed whale	*Peponocephala electra*	-	Occurs in deep warm waters over the continental shelf year-round.
Pygmy killer whale	*Feresa attenuata*	-	Occurs in waters over the continental slope year-round.
False killer whale	*Pseudorca crassidens*	-	Occurs in warm waters off of the continental shelf year-round.
Killer whale	*Orcinus orca*	-	Occurs year-round.
Long-finned pilot whale	*Globicephala melas*	-	Occurs year-round.
Short-finned pilot whale	*Globicephala macrorhynchus*	-	Occurs year-round.
Harbor porpoise	*Phocoena phocoena*	-	Potential to occur in waters over the continental shelf during fall, winter, and spring.
Pinnipeds			
Harbor seal	*Phoca vitulina*	-	Rare occurrences possible in the waters along the western edge of the Warning Areas.
Gray seal	*Halichoerus grypus*	-	Potential to occur in waters along the western edge of the Warning Areas in winter and spring.
Harp seal	*Pagophilus groenlandicus*	-	Potential to occur in waters along the western edge of the Warning Areas in winter and spring.

Notes:

[1] Sources: US Navy, 2009; US Navy, 2017; NMFS, 2018

Invasive Species

Overflight activities from contract ADAIR training in the Warning Areas would have no impacts on invasive species. Invasive species in the Warning Areas are therefore not described further.

Threatened and Endangered Species and/or Species of Concern

Federally endangered and threatened marine species protected under the ESA that could occur in the offshore environment in the Warning Areas are managed by NMFS, while avian species are managed by USFWS (see **Table 3-8**). Because there are no proposed ocean surface or underwater activities in Warning Areas, and activities are limited to aircraft overflights in the airspace where noise and visual cues could cause behavioral changes in birds, mammals, and sea turtles, there would be no impacts on listed fish, invertebrates, or crustaceans; however, the use of defensive countermeasures could have impacts on listed fish species foraging in the Atlantic Ocean within the Warning Areas. Of the listed species in the Warning Areas, three birds, six mammals, five sea turtles, and two fish species could therefore be impacted by the Proposed Action and are further described below.

Red Knot. The red knot is a large sandpiper with short thick legs, a reddish breast and head during breeding season, and gray plumage during the rest of the year. It is one of the longest-distance migrants, with some birds flying over 9,300 mi from breeding to wintering grounds. The red knot breeds in the Arctic tundra and winters along the southern tip of South America. The primary threat to this species is climate change, where rising sea heights affect its coastal breeding habitat, affecting the ability to forage. The red knot could be present in coastal Virginia and over the Warning Areas during migration periods; therefore, the red knot could be present in the action area.

Bermuda Petrel. The Bermuda petrel is the rarest of the gadfly petrels of the North Atlantic Ocean and was presumed extinct until the early twentieth century. Its breeding habitat is very limited to the small islets in Castle Harbor, Bermuda. The Bermuda petrel feeds at the sea surface on small squid, shrimp, and small fish and primarily feeds at night to avoid predation. Its distribution ranges across the Warning Areas during the nonbreeding season. It likely feeds in warm Gulf Stream waters off of North Carolina during the nonbreeding season (US Navy, 2009).

Roseate Tern. The roseate tern is listed as endangered in portions of its range from Canada south to North Carolina across its breeding habitat. In nonbreeding locations across the Western Hemisphere, such as the oceans adjacent to breeding habitat, which includes the Warning Areas, the roseate tern is listed as threatened. The roseate tern feeds on small, schooling fish which are captured by plunge-diving from the air into the water. Northern breeding populations migrate to wintering grounds in the Caribbean off of the Atlantic Coast. During that migration period, the roseate tern can occur in the Warning Areas (US Navy, 2009).

North Atlantic Right Whale. The North Atlantic right whale (*Eubalaena glacialis*) is one of the world's most endangered large whales. The number of individual North Atlantic right whales in the North Atlantic Ocean is approximately 400 (National Oceanic and Atmospheric Administration [NOAA] Fisheries, 2019). They primarily feed on zooplankton, particularly large calanoid copepods such as *Calanus*. They currently occur primarily in North Atlantic waters over the continental shelf ranging from Nova Scotia, Canada, south to Florida (US Navy, 2009). Designated critical habitat for the North Atlantic right whale occurs off the coast of North Carolina in the Warning Areas (59 Federal Register 28805).

In US waters, one calving area and two feeding areas in the United States are designated as critical habitat for the North Atlantic right whale. The Early Warning System was started in 1994 for the calving region along the southeastern US coast to reduce collisions with the North Atlantic right whale. This was then extended in 1996 to the feeding areas off New England. In 1999, a Mandatory Ship Reporting System for North Atlantic right whales was implemented by the US Coast Guard, which required vessels larger than 300 gross registered tons to report their location when entering North Atlantic right whale nursery and feeding areas. Ships also receive information on locations of the North Atlantic right whale sightings in order to avoid whale collisions. In October 2008, NMFS published the final rule (73 Federal

Register 60173) to implement speed restrictions in attempt to reduce ship collisions with the North Atlantic right whale. The final rule includes a speed restriction of 10 knots or less for commercial vessels greater than 60 ft in length during certain times of the year along the US east coast and modification of key shipping routes into Boston, Massachusetts (US Navy, 2009).

Sei Whale. The sei whale (*Balaenoptera boreali*) is mostly dark gray in color with a lighter belly, often with mottling on the back. The major prey species for the sei whale in the North Atlantic are copepods and krill. Sei whales occur in very low population numbers across the North Atlantic Ocean. They typically occur in deep, oceanic waters of the cool temperate zone and prefer regions of steep bathymetric relief, such as the continental shelf break, canyons, or basins between banks and ledges. They occur in the Warning Areas in deeper offshore waters but may also be seen in shallower waters during migration (US Navy, 2009).

Fin Whale. The fin whale (*Balaenoptera physalus*) has a v-shaped head and a tall, hooked dorsal fin that rises at a shallow angle from its back. It is the second largest whale species. The fin whale feeds by gulping a wide variety of organisms including small schooling fish, squid, and crustaceans (including krill). In the Warning Areas, fin whales occur in continental slope, shelf and deep canyon waters. They are the most commonly sighted whale in North Atlantic waters in the winter (US Navy, 2017).

Blue Whale. The blue whale (*Balaenoptera musculus*) is a baleen whale that occurs globally and is the largest animal to have ever lived on Earth. Blue whales can reach nearly 90 ft in length. Females are slightly larger than males. The blue whale feeds primarily on krill and feeds by gulping. Blue whales migrate and are most commonly found in the Warning Areas during fall, winter, and spring during migrations, but can occur year-round (US Navy, 2009).

Sperm Whale. The sperm whale (*Physeter microcephalus*) is the largest of the toothed whales and is distinguished by an extremely large head and a single blowhole located on the left side of its head (asymmetrical) near the tip. The sperm whale is mostly dark gray with some sperm whales having white patches on the belly. The sperm whale preys on large mesopelagic squids and other cephalopods, demersal fish, and benthic invertebrates. Sperm whales are globally distributed and occur in deep offshore waters. They occur in the Warning Areas during most of the year in waters beyond the continental shelf/slope break (US Navy, 2009).

Leatherback Turtle. The leatherback turtle (*Dermochelys coriacea*) is the largest and deepest diving extant sea turtle. Leatherback turtles feed throughout the epipelagic and into the mesopelagic zones of the water column on gelatinous zooplankton such as cnidarians (jellyfish and siphonophores) and tunicates (salps and pyrosomas). Leatherback turtles occur throughout the Warning Areas year-round with a peak off of the Virginia coast in May and July and off of the North Carolina's coast from mid-April through mid-October. Nesting has been recorded on North Carolina beaches (US Navy, 2009).

Loggerhead Turtle. Loggerhead turtles (*Caretta caretta*) are the most abundant species of sea turtle found in US coastal waters and inhabit offshore waters in the North Atlantic Ocean. Loggerhead turtles have a top shell that is slightly heart-shaped and reddish-brown in color with a pale, yellowish bottom shell. Their diet primarily consists of whelks and conch. Loggerhead turtles are circumglobal, occurring throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Designated critical habitat is present within the Warning Areas (US Navy, 2017; NMFS, 2018).

Kemp's Ridley Turtle. The Kemp's ridley turtle (*Lepidochelys kempii*) is the smallest sea turtle and the only sea turtle the primarily nests during daylight hours. Their diet primarily consists of shrimp, jellies, small fish, and mollusks. Kemp's ridley turtles primarily nest in the western Gulf of Mexico but have been observed nesting in North Carolina and Virginia. They can occur in the Warning Areas as they migrate to foraging grounds in the North Atlantic Ocean (US Navy, 2017).

Green Turtle. The green turtle (*Chelonia mydas*) has a smooth black, gray-green, brown, and yellow top shell and a yellowish-white bottom shell. Their diet consists mostly of seagrasses and algae. The green turtle was listed under the federal ESA in July 1978. Similar to the loggerhead turtle, the green turtle is

globally distributed and occurs in the Warning Areas year-round, especially during the first 5 to 6 years of life as they forage along the Atlantic Coast (US Navy, 2017 and NMFS, 2018).

Hawksbill Turtle. The hawksbill turtle (*Eretmochelys imbricata*) is a small- to medium-sized sea turtle, has the longest measured dive times of any sea turtle and are omnivorous during the later juvenile stage, feeding on encrusting organisms such as sponges, tunicates, bryozoans, algae, mollusks, and a variety of other items such as crustaceans and jellyfish; however, older juveniles and adults are more specialized, feeding primarily on sponges, which comprise as much as 95 percent of their diet in some locations. In the Warning Areas, hawksbill sea turtles are rare north of Florida and do not nest on any beaches in North Carolina, Virginia, or Delaware. Their occurrence would be limited to foraging individuals in the southern portion of the Warning Areas (US Navy, 2017).

Atlantic Sturgeon. The Atlantic sturgeon is federally listed as endangered in all of the Distinct Population Segments with the exception of the Gulf of Maine Distinct Population Segment. They occur in rivers and coastal waters from Canada to Florida. Atlantic sturgeon are anadromous; they are hatched in the freshwater of rivers, head to sea as juveniles, and return to their birthplace to spawn, or lay eggs, when they reach adulthood. Atlantic sturgeon are slow growing and late maturing and have been recorded to reach up to 16 ft in length and up to 60 years of age. The Atlantic sturgeon is known to occur in waters of the Chesapeake Bay and rivers that are tributaries to the Chesapeake Bay and as subadults and adults in marine waters of the Atlantic Ocean, including portions of the Warning Areas (NMFS, 2019a).

Shortnose Sturgeon. The shortnose sturgeon is federally endangered throughout its range. The shortnose sturgeon lives in rivers and coastal waters from Canada to Florida. They are amphidromous fish; they are hatched in freshwater of rivers and spend most of their time in the estuaries of these rivers. Unlike the Atlantic sturgeon, the shortnose sturgeon spends relatively little time in the ocean and generally remain close to shore. In the spring, adults move far upstream and away from saltwater to spawn. After spawning, the adults move downstream to estuaries. Shortnose sturgeon are also slow growing and late maturing and can be as large as 4.5 ft in length and live 30 years or more. The shortnose sturgeon is known from the Chesapeake Bay and its tributaries as well as from the nearshore marine environment of the Atlantic Ocean but is unlikely to occur in the Warning Areas (NMFS, 2019b).

3.6 LAND USE

3.6.1 *Definition of the Resource*

The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws; however, no nationally recognized convention or uniform terminology has been adopted for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. This section addresses potential land impacts from implementation of the Proposed Action on JBLE-Langley and discusses Air Force land use categories identified on the base:

- Administrative – headquarters, security operations, offices;
- Airfield and Airfield Pavements – runways, taxiways, aprons, overruns;
- Airfield Operations and Maintenance – hangars, aircraft maintenance units, squadron operations;
- Community (commercial) – commissary, base exchange, dining;
- Community (service) –gym, recreation center, theater;
- Housing (accompanied) – family housing;
- Housing (unaccompanied) – airman housing, visitor housing, temporary lodging;
- Industrial – base engineering, maintenance shops, warehouses;
- Medical/Dental – hospital, clinic, pharmacy;
- Open Space – conservation area, buffer space;
- Outdoor Recreation – ballfields, outdoor courts, golf course; and
- Water –wetlands, ponds, creeks, and drainage ditches
- Infill – redevelopment – adaptive reuse

The General Plan (JBLE, 2013) is the base's planning tool to guide compatible land uses and future development on JBLE-Langley and was prepared in response to AFI 32-7062, *Comprehensive Planning*. The name of this planning document has since been retitled the Installation Development Plan (IDP). Two main objectives of land use planning are to ensure both orderly growth and compatible uses among adjacent property parcels or areas. This document sets forth the responsibilities and requirements for comprehensive planning and direction for future development on JBLE-Langley.

ACTIVITY MANAGEMENT PLANS ARE DEVELOPED FOR AN ACTIVITY THAT USES MULTI-DISCIPLINARY MANAGEMENT TECHNIQUES (E.G., FINANCIAL, ENGINEERING, PLANNING, PROGRAMMING, ENVIRONMENTAL, INFORMATION TECHNOLOGY, RISK MANAGEMENT, ADMINISTRATION) OVER THE LIFECYCLE ON ASSETS AND APPLIES THEM IN THE MOST COST EFFECTIVE MANNER IN ORDER TO ACHIEVE SPECIFIED AIR FORCE LEVELS OF SERVICE.

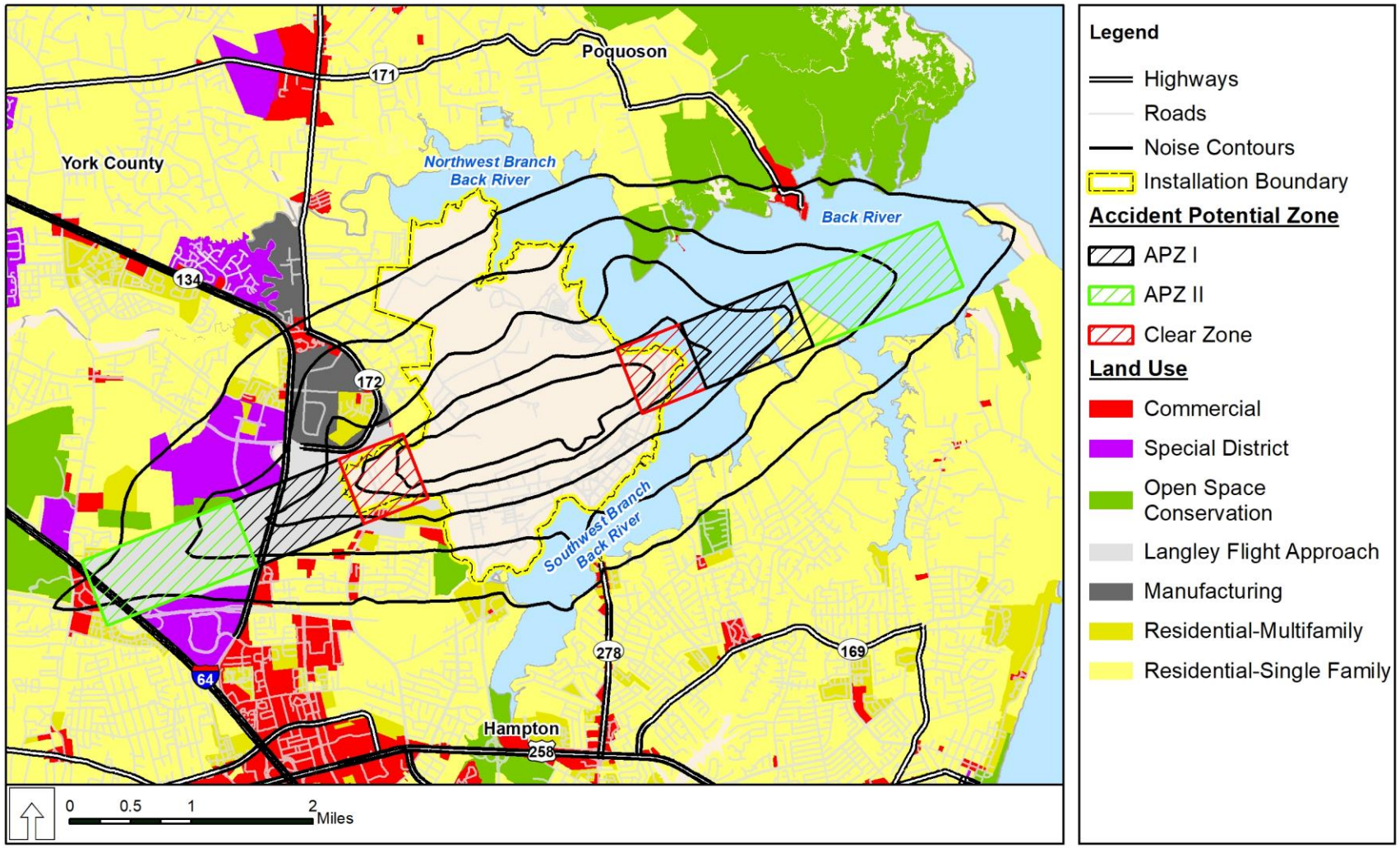
To address land use with respect to noise and safety associated with aircraft operations, military installations, including JBLE-Langley, have established an Air Installation Compatible Use Zone (AICUZ) program. The goal of the AICUZ program is to protect the health, safety, and welfare of those living or working near military air installations and to protect the military operational capabilities of the base. The AICUZ program includes an analysis of the effects of aircraft noise, accident potential, land use compatibility, and development adjacent to the base (JBLE, 2016b). The AICUZ assists governmental entities and communities anticipate, identify, and promote compatible land use and development near military installations. **Section 3.2** provides a detailed description of noise and **Section 3.3** provides a description of the accident potential zones associated with JBLE-Langley.

The location(s) and extent of proposed actions need to be evaluated for their potential effects on project sites and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include existing land use at the project site, the types of land use on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence." The ROI for land use and the land surrounding the facilities proposed for use and the land that is within the airfield noise contours and safety zones (**Figure 3-7**). The ROI for land use would also include the land beneath the airspace; however, the airspace where the Proposed Action would take place includes Warning Areas W-72, W-122, and W-386, which are over water. As such, there is no land use associated with this airspace.

Coastal Zone Management Act

The coastal zone refers to coastal waters and the adjacent shorelines, including islands, transition and intertidal areas, salt marshes, wetlands, and beaches, extending to the outer limit of State title and ownership under the Submerged Lands Act (i.e., 3 NM). The NOAA oversees the Coastal Zone Management Program for the federal government. Coastal areas in the US receive special land use protections through the federal Coastal Zone Management Program. Authorized by the Coastal Zone Management Act (CZMA) of 1972 (16 USC § 1451 et seq., as amended), this federal program addresses the coastal issues of the United States through a voluntary partnership among the federal government and the coastal and Great Lakes states and territories. The program's purpose is to protect, restore, and responsibly develop the nation's diverse coastal communities and resources.

Section 307 of the CZMA provides states with the authority to offer input in federal agency decision making for activities potentially affecting coastal uses or resources. This federal consistency provision provides authority to the states that would not otherwise be authorized through other federal programs. Section 307 of the CZMA requires that federal actions that have reasonably foreseeable effects on any coastal use or natural resources of the coastal zone be consistent with the enforceable policies of a state's approved coastal management program. Federal agency activities must be consistent with the state's coastal management program to the maximum extent practicable. A CZMA consistency determination is included in **Appendix F**.



Source: City of Hampton GIS, York County GIS, and City of Poquoson GIS, 2019

Figure 3-7. Generalized Existing Land Use and Noise Contours, Accident Potential Zones, and Clear Zones.

The Virginia Coastal Zone Management Program is directed by a network of state agencies and local governments that administer enforceable laws, regulations, and policies that protect Virginia's coastal resources. These include tidal and nontidal wetlands, fisheries, subaqueous lands, dunes and beaches, point source air pollution, point source water pollution, nonpoint source water pollution, shoreline sanitation, and coastal lands. Virginia's coastal zone includes all of Virginia's Atlantic Coast watershed. Parts of the Chesapeake Bay and Albermarle – Pimlico Sound watersheds, four tidal rivers (the Potomac, Rappahannock, York, and James), and all waters within and out to the 3-mi Territorial Sea boundary.

For a detailed discussion of wetlands within the ROI see Biological Resources (**Section 3.5.2.2**).

3.6.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

In 2010, Langley AFB was merged administratively with Fort Eustis to form JBLE. These two installations are geographically separated by 17 mi (see **Figure 1-2**). JBLE-Langley is in the city of Hampton, near the southern end of the Lower Peninsula of southeastern Virginia. The northeastern to the southeastern edge of the base is bounded by the Back River and its northwest and southwest branches. The NASA Langley Research Center (LaRC) is adjacent to the base on the northern boundary. The rest of the base is bounded by the city of Hampton. The main installation portion of JBLE-Langley consists of 2,833 ac. JBLE-Langley also includes the Langley Family Housing area and Big Bethel reservoir and recreation area that are located about 5 mi northwest of the main base in York County and consist of 284 and 447 ac, respectively.

The City of Hampton controls the planning and zoning of land uses surrounding the base, LaRC controls the planning for its property, and JBLE-Langley manages the base land uses. As previously discussed, JBLE-Langley is bounded along its eastern side by water and is constrained by the provisions of the Chesapeake Bay Protection Program. LaRC is includes research and maintenance facilities, administrative offices, and support areas (NASA, 2017a). The remainder of the base is within the city of Hampton where development around the base consists of mixed residential, commercial, and light industrial land uses. On JBLE-Langley, 12 land use categories have been identified. **Table 3-11** provides a summary of land uses on the main base. Buildings 751 and 790 are located along the southeast side of the airfield in an area with a land use designation of Aircraft Operations and Maintenance (JBLE, 2013). The Aircraft Operations and Maintenance category comprises about 123 ac of main base property. The land use adjacent to Buildings 751 and 790 is Airfield Pavement. Currently, these facilities are located within 80- to 85-dBA noise contours.

Table 3-11
Land Use Summary of Joint Base Langley-Eustis, Langley Air Force Base

Category	Acreage
Airfield and Airfield Pavements	923.0
Aircraft Operations and Maintenance	123.1
Industrial	214.6
Infill/Redevelopment/Adaptive/Re-Use	298.8
Administrative	184.3
Community (Commercial)	81.8
Community (Service)	40.6
Medical	31.6
Housing (Accompanied)	87.7
Housing (Unaccompanied)	44.6
Outdoor Recreation	391.0
Open Space (Includes Water)	674.0
Total	**3,095.1**

Source: JBLE, 2013

The base and surrounding cities and counties have maintained a strong working relationship, JBLE-Langley and the City of Hampton collaborate on land use issues that may impact the important missions on base through the development and implementation of a Joint Land Use Study (JLUS) (City of Hampton, 2010). The goal of the JLUS is to protect the viability of current and future missions at JBLE-Langley and accommodate community growth and economic sustainment while maintaining public health and safety. The City of Hampton has also adopted the JBLE-Langley AICUZ guidelines for determining zoning near the base. The most recent AICUZ for JBLE-Langley was conducted in 2016, which indicated that current noise is greatly reduced from the 2007 AICUZ (JBLE, 2016b).

Off-base land within the JBLE-Langley noise contours account for approximately 4,128 ac (**Table 3-12**). Most of this land (42 percent [1,742 ac]) is classified as single-family residential; however, most of the residential areas are within noise contours of the 65- to 70- and 70- to 75-dBA DNL. The next greatest amount of land use includes commercial mixed business use and manufacturing with approximately 1,380 ac. Approximately 349 ac comprise Conservation, Parks, and Open Space land use categories.

Table 3-12
Off-base Land Use within Joint Base Langley-Eustis, Langley Air Force Base Noise Contours

Land Use Description	Acres Within Noise Contours						Percent of Total
	65 dBA DNL	70 dBA DNL	75 dBA DNL	80 dBA DNL	85 dBA DNL	Total	
General Commercial	5.0	19.6	1.6	0.1	0.0	26.3	0.7
Limited Commercial	47.0	0.0	0.0	0.0	0.0	47.0	1.0
Neighborhood Commercial	84.2	18.1	6.3	0.0	0.0	108.6	2.8
Hampton Roads Center North/South	377.5	34.7	0.0	0.0	0.0	412.2	10.0
Parks and Open Space General	94.8	15.2	0.0	0.0	0.0	110.0	2.9
Limited Manufacturing	43.6	147.3	18.2	0.0	0.0	209.1	5.0
Light Manufacturing	0.0	15.1	2.8	0.0	0.0	17.9	0.5
Heavy Manufacturing	0.0	32.6	0.0	0.0	0.0	32.6	1.0
Langley Flight Approach Manufacturing	4.7	143.2	172.0	0.1	0.0	320.0	8.0
Langley Flight Approach Mixed Business and Manufacturing	2.9	76.1	21.0	0.0	0.0	100.0	2.5
Langley Flight Approach Hampton Roads Center	77.8	81.3	1.2	0.0	0.0	160.3	4.0
Langley Flight Approach Limited Business I & II	253.9	104.5	0.0	0.0	0.0	358.4	8.0
Conservation	173.0	52.8	13.4	0.0	0.0	239.2	5.7
Langley Flight Approach Limited Residential	9.6	0.0	0.0	0.0	0.0	9.6	0.2
Multi-Family Residential	140.0	52.2	0.0	0.0	0.0	192.2	4.6
Single Family Residential	1,230.6	453.1	46.0	12.4	0.1	1,742.2	42.0
Single Family Rural Residential	17.0	0.0	0.0	0.0	0.0	17.0	0.5
Mixed Residential	25.2	0.7	0.0	0.0	0.0	25.9	0.6
Total	**2,586.8**	**1,246.5**	**282.5**	**12.6**	**0.1**	**4,128.5**	**100.0**

Notes:
dBA = A-weighted decibels; DNL= Day-Night Average Sound Level

Approximately 967 ac of the airfield safety zones are located on off-base land. Safety zones on the eastern portion are primarily situated over open water. Of the 967 ac, most on the western portion of the installation, approximately 52 ac are in CZs and include primarily manufacturing, mixed business, and commercial land uses. Single- and multi-family residential comprise approximately 10 ac of land use within the CZs. APZ I includes approximately 391 ac. Land use within the APZ I area primarily falls within the Flight Approach Flight Approach Manufacturing and Flight Approach Hampton Roads Center land use categories with approximately 251 and 83 ac, respectively. Approximately 51 ac of single-family residential land use are located within APZ I. APZ II comprises approximately 524 ac. Land use within APZ II primarily includes 392 ac in the Flight Approach Limited Business I and II land use categories. Approximately 45.5 ac of single-family residential land use are located within APZ II.

3.6.3 *Existing Conditions – Airspace*

The airspace proposed for ADAIR training activities at JBLE-Langley include three Warning Areas (W-386, W-72, and W-122). These Warning Areas are over the Atlantic Ocean; therefore, no land use is associated with this airspace.

3.7 SOCIOECONOMICS – INCOME AND EMPLOYMENT

3.7.1 *Definition of the Resource*

There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region. Economic data are typically presented at county, state, and US levels to characterize baseline economic conditions in the context of regional, state, and national trends.

The Hampton Roads region (comprised of 17 counties, cities, and towns and defined by the US Census Bureau as the Virginia Beach-Norfolk-Newport News, Virginia and North Carolina Metropolitan Statistical Area) and the independent city of Hampton make up the ROI for this resource. The Warning Areas are entirely over the Atlantic Ocean; therefore, socioeconomics – income and employment is not a resource of concern for this special use airspace and is not discussed further.

3.7.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

The unemployment rate for the Hampton Roads region was 3.9 percent in 2017 (Bureau of Labor Statistics, 2018). This is similar to the 2017 unemployment rate for Virginia (3.7 percent) and the United States (3.9 percent) (Bureau of Labor Statistics, 2018). The median household income in 2016 for the Hampton Roads region was $58,852 and for the city of Hampton was $49,890. The rate of persons in poverty in 2016 was 12.4 percent for the Hampton Roads region and 16.4 percent for the city of Hampton (US Census Bureau, 2018a).

A total of 14,747 active duty military personnel and 6,218 civilian personnel are employed at JBLE. It is estimated that 33,700 military dependents are associated with the JBLE personnel. The estimated total economic impact from JBLE to the region in Fiscal Year 2017 was estimated to be $2.1 billion. This includes a total military payroll of $937.7 million and a total civilian payroll of $533.5 million (JBLE, 2016a).

3.8 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

3.8.1 *Definition of the Resource*

Executive Orders direct federal agencies to address disproportionate environmental and human health effects in minority and low-income communities and to identify and assess environmental health and safety risks to children.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, pertains to environmental justice issues and relates to various socioeconomic groups and disproportionate impacts that could be imposed on them. This EO requires that federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. EO 12898 was enacted to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."
For the purposes of this project minority populations are defined as Alaska Natives and American Indians, Asians, Blacks or African-Americans, Native Hawaiians, and Pacific Islanders or persons of Hispanic origin (of any race); low-income population include persons living below the poverty threshold as determined by the US Census Bureau; and youth populations are children under the age of 18 years.

Minority, low-income, and youth populations that could be disproportionately impacted by the project are addressed for the city of Hampton and the Hampton Roads region (comprised of 17 counties, cities, and towns, and defined by the US Census Bureau as the Virginia Beach-Norfolk-Newport News, Virginia and North Carolina Metropolitan Statistical Area) and are compared to those populations in the state of Virginia and the United States. The Warning Areas are entirely over the Atlantic Ocean; therefore, environmental justice and protection of children are not resources of concern for this special use airspace and is not discussed further.

3.8.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

An evaluation of minority and low-income populations in the Hampton Roads region and the city of Hampton form a baseline for the evaluation of the potential for disproportionate impacts on these populations from the Proposed Action. The city of Hampton has a substantially higher population percentage of minorities compared to the State of Virginia and US populations (US Census Bureau, 2018b); the majority of the city of Hampton population identifies as a minority (**Table 3-13**). The Black or African-American population represents 50.5 percent of the city of Hampton population (US Census Bureau, 2018b). The Hampton Roads region has a higher percentage of minority populations than the state and US as a whole, but a smaller percentage of minority populations than the city of Hampton. Further, the estimated median household income is lower and the rate of poverty is higher in the city of Hampton than the Hampton Roads region, the State of Virginia, and the United States. (**Table 3-13**); however, the percentage of children in the city of Hampton and the Hampton Roads region is similar to the percentage of children in Virginia and the United States as a whole (**Table 3-13**).

Table 3-13
Total Population and Populations of Concern (2017)

Location	Total Population	Percent Minority	Percent Low-Income	Percent Youth
City of Hampton	134,669	58.2	14.9	21.5
Hampton Roads Region	1,714,428	36.9	9.5	24.8
Virginia	8,470,020	20.3	10.6	22.1
United States	325,719,178	23.4	12.3	22.6

Source: US Census Bureau, 2018b

3.9 CULTURAL RESOURCES

3.9.1 *Definition of the Resource*

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and EOs.

Cultural Resources include the following subcategories:

- Archaeological (i.e., prehistoric or historic sites where human activity has left physical evidence of that activity, but no structures remain standing);
- Architectural (i.e., buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance); and
- Traditional Cultural Properties (resources of traditional, religious, or cultural significance to Native American tribes and other communities).

Significant cultural resources are called historic properties and are listed on the National Register of Historic Places (NRHP) or have been determined to be eligible for listing. To be eligible for the NRHP, historic properties must be 50 years old and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance, and meet at least one of four criteria (National Park Service, 2002):

- Associated with events that have made a significant contribution to the broad patterns of our history (Criterion A);
- Associated with the lives of persons significant in our past (Criterion B);
- Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C); and/or
- Have yielded or be likely to yield information important in prehistory or history (Criterion D)

Properties that are less than 50 years old can be considered eligible for the NRHP under Criterion Consideration G if they possess exceptional historical importance. Those properties must also retain historic integrity and meet at least one of the four NRHP Criteria for Evaluation (Criterion A, B, C, or D). The term “Historic Property” refers to National Historic Landmarks, NRHP-listed, and NRHP-eligible cultural resources.

Federal laws protecting cultural resources include the Archaeological and Historic Preservation Act of 1960 as amended, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the NHPA, as amended through 2016, and associated regulations (36 CFR Part 800). The NHPA requires federal agencies to consider effects of federal undertakings on historic properties prior to making a decision or taking an action and integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the Section 106 consultation process, as set forth

in 36 CFR Part 800. Section 106 of the NHPA also requires agencies to consult with federally recognized Indian tribes with a vested interest in the undertaking.

Section 106 of the NHPA requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects on historic properties (36 CFR § 800.1[a]). For cultural resource analysis, the Area of Potential Effects (APE) is used as the ROI. APE is defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist," (36 CFR § 800.16[d]) and thereby diminish their historic integrity. The APE for direct and indirect effects for the ADAIR project includes the Langley Field Historic District (**Figure 3-8**) and the primary operational airspace as described in **Section 2.1.6** (see **Figure 1-4**).

3.9.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

3.9.2.1 Environmental Setting

The Langley Field Historic District, defined as the terrestrial APE for JBLE-Langley, encompasses the easternmost portion of JBLE-Langley, situated at the confluence of the Northwest and Southwest branches of the Back River which flow into Chesapeake Bay. The APE, approximately 845 ac in size, is bound to the west by the base's North Ramp, north of Runway 8-26, and Taxiway M, south of Runway 8-26. The area that was to become Langley Field, purchased in 1916, was the first land acquired by the US government for aviation purposes (Cook, 2000). From historic topographic maps, it was largely undeveloped before this time. The land making up the installation is flat with large sections of marshland that have been backfilled to create land.

The district includes three distinct historic areas: the Heavier-than-Air (HTA) Area, the Lighter-than-Air (LTA) Area, and the airfield linking them. Eighty percent of the district's 312 total resources contribute to the significance of the district. Facilities include housing, hangars, and industrial and administrative buildings. These historic resources are associated with the development of Langley Field and its two federal occupants, the air arm of the US Army and the National Advisory Committee for Aeronautics, the predecessor of the NASA (JBLE, 2012).

3.9.2.2 Archaeological and Traditional Cultural Properties

Twelve archeological studies have been conducted at JBLE-Langley; approximately 1,307 ac of the base have been surveyed at some level. As a result, 31 archaeological sites, including two cemeteries, have been formally recorded at JBLE-Langley (JBLE, 2017b). Of these, nine archaeological sites are located within the terrestrial APE as defined, three are eligible for inclusion on the NRHP (Virginia Department of Historic Resources, 2018) and one is recommended potentially eligible for inclusion on the NRHP (JBLE, 2017b). The three sites eligible for inclusion include: 44HT0010, Sherwood Plantation, a multicomponent site dating from the Late Woodland through the late nineteenth century that includes a shell midden and historic cemetery (Moore et al., 2006); 44HT0012, Lamington Plantation, including the intact remains of the early to mid-nineteenth-century occupation of the plantation (Moore et al., 2006); and 44HT0096, unnamed, a multicomponent site with significant occupations beginning in the Late Woodland and running through the eighteenth century including 13 unmarked historic burials (Moore et al., 2006, 2009). Site 44HT0117, unnamed, including deposits from the Early to Middle Woodland periods as well as the mid-to-late eighteenth through early twentieth centuries has been recommended potentially eligible for inclusion on the NRHP (Stewart et al., 2010).

Traditional cultural properties and sacred sites are a special class of cultural resources that require specialized expertise in their identification and assessment. The base is not in possession of prehistoric human remains, funerary objects, sacred objects, or objects of cultural patrimony (JBLE, 2017b). No known traditional cultural resources and sacred sites have been identified at JBLE-Langley. In January 2018, six Virginia tribes, including the Chickahominy, Eastern Chickahominy, the Upper Mattaponi, the Rappahannock, the Monacan, and the Nansemond were granted federal recognition through legislative

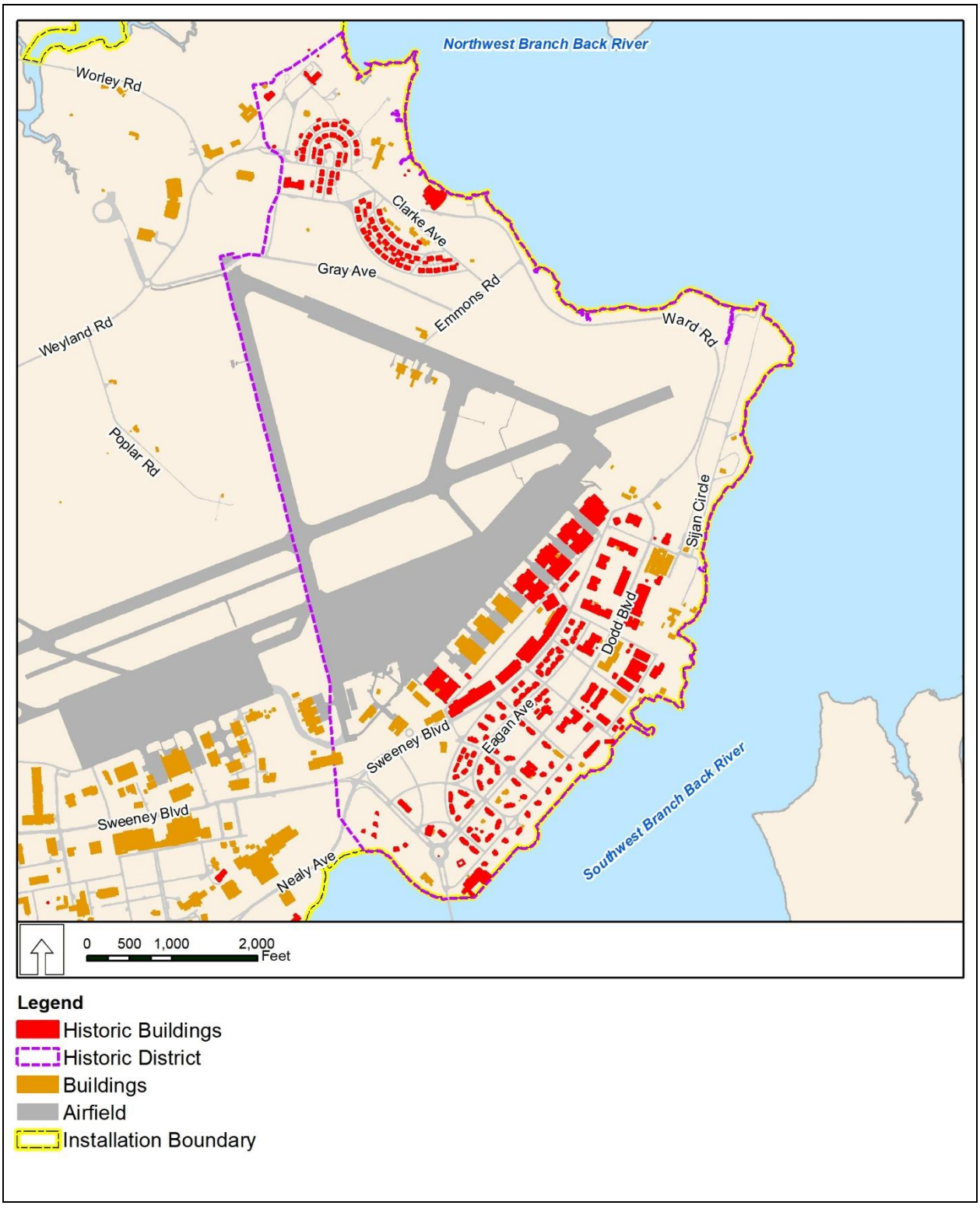


Figure 3-8. Langley Field Historic District, Joint Base Langley-Eustis, Langley Air Force Base, Virginia.

action when Congress passed the Thomasina E. Jordan Indian Tribes of Virginia Federal Recognition Act (Portnoy, 2018). They joined the Pamunkey tribe, who had attained formal federal recognition through the administrative process overseen by the US Department of the Interior (Department of Interior Bureau of Indian Affairs, 2015). The Catawba Indian Nation, the Delaware Tribe, and the Delaware Nation of Oklahoma also have a historical connection to Virginia and the coastal region (US Department of Housing and Urban Development, 2017); therefore, ten federally recognized Native American tribes have been contacted regarding their knowledge of traditional cultural resources and sacred sites within the APE.

3.9.2.3 Architectural Properties

JBLE-Langley owns 246 historic buildings determined eligible for inclusion in the NRHP (JBLE, 2017b). The majority of these buildings are in the Langley Field Historic District. The historic district was determined eligible for inclusion in the NRHP in 1997 (JBLE, 2017b). An NRHP Registration Form was finalized in 2012, but the district is not listed on the NRHP (JBLE, 2012). The historic period of significance for the Langley Field Historic District is 1917 to 1947, which spans the installation's Army era as an early flying field and airship school through its role as headquarters of the 1st Bomber Command during World War II. The district features 227 contributing historic buildings, and three distinct historic areas: the HTA Area, the LTA Area, and the airfield linking them. One contributing building (Hangar 750) located within the HTA Area of the Langley Field Historic District is also a contributing element of the NRHP-listed NASA LaRC Historic District, roughly bordering the eastern boundary of JBLE-Langley.

3.9.3 *Existing Conditions – Airspace*

3.9.3.1 Environmental Setting

The airspace APE for ADAIR includes the airspace as described in **Section 2.1.6**. Because this airspace is over water, no discussion of traditional cultural properties or NRHP-listed resources is included. Potential underwater archaeological resources are described below.

3.9.3.2 Cultural Resources in the Marine Environment

The eastern seaboard of the United States is rich in maritime tradition. It includes thousands of miles of coastline as well as numerous tributaries, inlets, and bays that provided avenues for transportation, trade, and a way of life to various groups from prehistoric times through the present. As such, the potential for submerged, underwater archaeological resources is equally rich and varied. The offshore APE for the Proposed Action includes portions of the waters of the Continental Shelf of Delaware, Maryland, Virginia, and North Carolina. Currently only Maryland and North Carolina have specific programs dedicated to underwater resources. The Virginia Department of Historic Resources' underwater program was terminated in the 1980s (Blanton and Margolan, 1994).

Though the location, number, and type of underwater archaeological resources have not been as formally documented through time as terrestrial resources have, underwater resources have gained scientific and public prominence in the past two decades and are currently being tracked through several industry and government-run vehicles. The Atlantic Outer Continental Shelf Shipwreck Database (Holland, 2012) has consolidated data from a variety of primary and secondary sources (including contemporary published shipwreck inventories and newspaper articles as well as data from the US Coast Guard, US Customs Service, and Bureau of Marine Inspection and Navigation). It estimates there are nearly 6,000 underwater shipwrecks along the shores of Delaware, Maryland, Virginia, and North Carolina. The NOAA maintains a Wrecks and Obstructions Database. Their Automated Wreck and Obstruction Information System contains information on over 10,000 submerged wrecks and obstructions in the coastal waters of the United States including latitude and longitude and a brief historic description (NOAA, n.d.).

Underwater resources are dominated by shipwrecks from the following periods and events: European exploration of the region, the American Revolution, the War of 1812, the Civil War, naval preparations for World War I, and World War II. Private and commercial wrecks that span the seventeenth through

twentieth centuries are documented as well. While shipwrecks have understandably been the primary subject of underwater archaeology, it is important to note that the potential for submerged prehistoric sites is equally great. Human occupation of the region included the Continental Shelf which was exposed due to significantly lower sea levels during the Pleistocene period. The retreat of the Ice Age resulted in the flooding of extensive areas of formerly dry land (Blanton and Margolin, 1994).

3.10 HAZARDOUS MATERIALS AND WASTES, CONTAMINATED SITES, AND TOXIC SUBSTANCES

3.10.1 *Definition of the Resource*

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Toxic Substances Control Act (TSCA), defines hazardous materials (HAZMAT). HAZMAT is defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, and incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. The Occupational Safety and Health Administration (OSHA) is responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety under 29 CFR Part 1910. OSHA also includes the regulation of HAZMAT in the workplace and ensures appropriate training in their handling.

The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. Hazardous waste is defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes, that pose a substantial present or potential hazard to human health or the environment. In general, both HAZMAT and hazardous wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health and welfare or the environment when released or otherwise improperly managed.

AFPD 32-70, *Environmental Quality*, establishes the policy that the Air Force is committed to

- cleaning up environmental damage resulting from its past activities;
- meeting all environmental standards applicable to its present operations;
- planning its future activities to minimize environmental impacts;
- responsibly managing the irreplaceable natural and cultural resources it holds in public trust; and
- eliminating pollution from its activities wherever possible.

AFI 32-7044, *Storage Tank Compliance*, implements AFPD 32-70 and identifies compliance requirements for underground storage tanks (USTs), aboveground storage tanks (ASTs), and associated piping that store petroleum products and hazardous substances. Evaluation of HAZMAT and hazardous wastes focuses on USTs and ASTs as well as the storage, transport, and use of pesticides, fuels, oils, and lubricants. Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a Proposed Action. In addition to being a threat to humans, the improper release of HAZMAT and hazardous wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of HAZMAT or hazardous wastes, the extent of contamination varies based on type of soil, topography, weather conditions, and water resources.

AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of HAZMAT throughout the Air Force. It applies to all Air Force personnel who authorize, procure, issue, use, or dispose of HAZMAT, and to those who manage, monitor, or track any of those activities. AFI 32-7042, *Waste Management*, sets forth procedures for management of hazardous waste and is the driver for the development of the JBLE-Langley *Hazardous Waste Management Plan*.

Through the ERP initiated in 1980, a subcomponent of the Defense ERP (formerly the Installation Restoration Program) that became law under SARA, each DOD installation is required to identify,

investigate, and clean up hazardous waste disposal or release sites. Remedial activities for ERP sites follow the Hazardous and Solid Waste Amendment of 1984 under the RCRA Corrective Action Program and Comprehensive Environmental Response, Compensation, and Liability Act. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of contaminants, minimize potential hazards to human health and the environment, and clean up contamination through a series of stages until it is decided that no further remedial action is warranted.

Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be foreclosed where a groundwater contaminant plume remains to complete remediation).

Toxic substances might pose a risk to human health but are not regulated as contaminants under the hazardous waste statutes. Included in this category are asbestos-containing materials (ACM), lead-based paint (LBP), radon, and polychlorinated biphenyls (PCBs). The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

Asbestos. AFI 32-1052, *Facility Asbestos Management*, provides the direction for asbestos management at Air Force installations. This instruction incorporates by reference applicable requirements of 29 CFR Part 669 et seq., 29 CFR § 1910.1025, 29 CFR § 1926.58, 40 CFR § 61.3.80, Section 112 of the CAA, and other applicable AFIs and DOD Directives. AFI 32-1052 requires bases to develop an Asbestos Management Plan to maintain a permanent record of the status and condition of ACM in installation facilities, as well as documenting asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by the USEPA with the authority promulgated under OSHA, 29 U.S.C. § 669 et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

Lead-based Paint. Human exposure to lead has been determined an adverse health risk by agencies such as OSHA and the USEPA. Sources of exposure to lead are dust, soils, and paint. In 1973, the Consumer Product Safety Commission (CPSC) established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint. In 1978, under the Consumer Product Safety Act (Public Law 101-608, as implemented by 16 CFR Part 1303), the CPSC lowered the allowable lead level in paint to 0.06 percent (600 ppm). The Act also restricted the use of LBP in nonindustrial facilities. DOD implemented a ban of LBP use in 1978; therefore, it is possible that facilities constructed prior to or during 1978 may contain LBP.

Radon. The US Surgeon General defines radon as an invisible, odorless, and tasteless gas, with no immediate health symptoms, that comes from the breakdown of naturally occurring uranium inside the earth (US Surgeon General, 2005). Radon that is present in soil can enter a building through small spaces and openings, accumulating in enclosed areas such as basements. No federal or state standards are in place to regulate residential radon exposure at the present time, but guidelines were developed. Although 4.0 picocuries per liter (pCi/L) is considered an “action” limit, any reading over 2 pCi/L qualifies as a “consider action” limit. The USEPA and the US Surgeon General have evaluated the radon potential around the country to organize and assist building code officials in deciding whether radon-resistant features are applicable in new construction. Radon zones can range from 1 (high) to 3 (low).

Polychlorinated Biphenyls. PCBs are a group of chemical mixtures used as insulators in electrical equipment, such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the United States until they were banned in 1979. The disposal of PCBs is regulated under the federal TSCA (15 U.S.C. § 2601 et seq., as implemented by 40 CFR Part 761), which banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems. Per Air Force policy, all installations should have been PCB-free as of 21 December 1998. In accordance with 40 CFR Part 761 and Air Force policy, both of which regulate all PCB articles, which are regulated as follows:

- Less than 50 ppm—non-PCB (or PCB-free)
- 50 ppm to 499 ppm—PCB-contaminated
- 500 ppm and greater—PCB equipment (USEPA, 2008)

The TSCA regulates and the USEPA enforces the removal and disposal of all sources of PCBs containing 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment.

The ROI for this resource is JBLE-Langley, except for radon which is the city of Hampton.

3.10.2 *Existing Conditions – Joint Base Langley-Eustis, Langley Air Force Base*

3.10.2.1 Hazardous Materials and Wastes

The 633 CES Installation Management Flight has the overall responsibility for implementing the hazardous waste program and is the lead for monitoring compliance with applicable federal, state and local regulations. Operations at JBLE-Langley, including aircraft operations, require the use and storage of hazardous materials. Hazardous substances used at JBLE-Langley are primarily for aircraft maintenance and training operations and include oil, Jet A fuel, diesel, gasoline, hydraulic fluid, hydrazine, paints, solvents, detergents, adhesives/sealants, lube oil, batteries, antifreeze, and deicing chemicals. Hazardous and toxic materials procurement are controlled and tracked through the Hazardous Materials Pharmacy (HAZMART). HAZMART provides centralized management of the procurement, handling, storage, and issuing of hazardous materials and turn-in, recovery, reuse, or recycling of hazardous materials. It also ensures that only the smallest quantities of HAZMAT necessary to accomplish the mission are purchased and used (JBLE-Langley, 2016, 2017c).

The 633 CES/CEIEC (Environmental Compliance) maintains a *Hazardous Waste Management Plan* (JBLE-Langley, 2017c) in accordance with AFI 32-7086, AFI 32-7042, and AFI 23-502, *Recoverable and Unusable Liquid Petroleum Products*. The purpose of this plan is to provide base personnel with an organized program that allows for proper waste management and generated hazardous waste to be managed in compliance with all federal, state, and local laws and regulations. The plan sets base policies and assigns responsibilities to base personnel in order to preserve public health and the environment from activities managing and generating hazardous wastes.

JBLE-Langley is a large-quantity hazardous waste generator. All hazardous waste is properly segregated, stored, characterized, labeled, and packaged for collection at designated initial satellite accumulation points. A licensed contractor transports the waste from the accumulation points to the single designated 90-day Hazardous Waste Storage Area at Building 1390, where it is processed for disposal before 90 days has expired. A licensed disposal contractor picks up the waste and transports it off base for disposal in a licensed disposal facility. Accumulated wastes gathered at a 90-day Hazardous Waste Storage Area are analyzed, characterized, prepared for shipment, and managed by the DLA Disposition Services in Norfolk, Virginia, which arranges for disposal through its contractors (JBLE-Langley, 2016, 2017c).

3.10.2.2 Environmental Restoration Program Sites

JBLE-Langley's environmental cleanup program is managed under the DOD ERP. There are 66 ERP sites at JBLE-Langley. Of those 66 sites, 54 have been closed or require no further action and 12 are in Long-Term Management.

ERP sites ST-27, ST-29, ST-32, and ST-33 are proximate to the Proposed Action area (**Figure 3-9**). The current status of all four ERP sites is site closed, which indicates that all response actions are complete at these four restoration sites (JBLE-Langley, 2007).

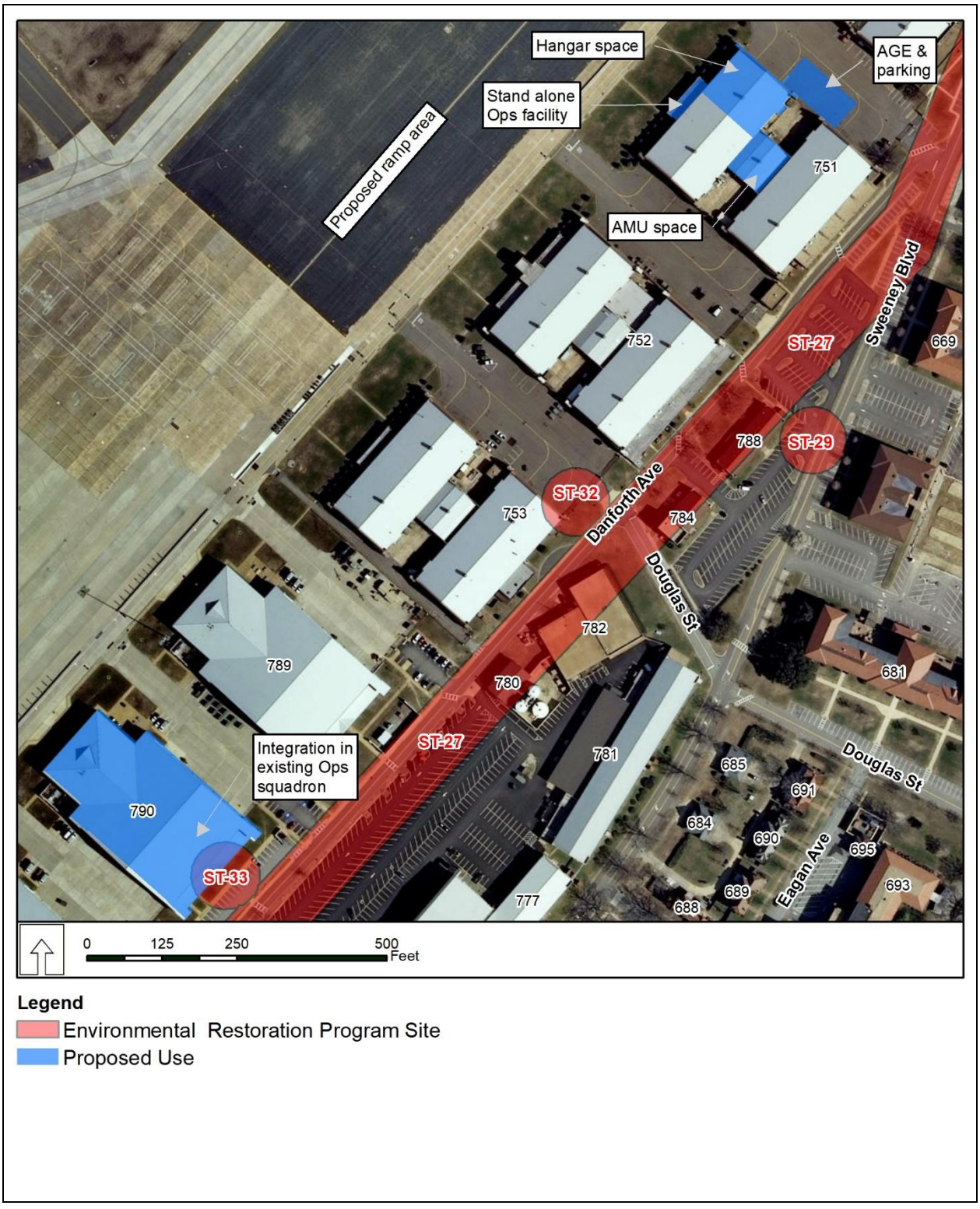


Figure 3-9. Environmental Restoration Program Sites Proximate to the Proposed Facilities for Contract Adversary Air at Joint Base Langley-Eustis, Langley Air Force Base.

ST-27: Danforth Fuel Line Leaks, Fuel Saturated Area. Site ST-27 includes the underground portion of the JP-4 fuel transfer line that carried jet fuel from the Bulk Fuel Storage Area (Site ST-34) to the West Parking Apron (Site ST-26) in the southeastern part of the base. The fuel transfer line is a 6,600-ft-long, 8- to 10-inch diameter steel pipe that ranges in age from 30 to 50 years. Approximately 5,600 ft of the pipeline is buried underground. The pipeline starts at Building 741, runs under Danforth Avenue to its intersection with Sweeney Boulevard, continues parallel to Sweeney Boulevard, turns northwest near the intersection with Nealy Avenue, and terminates at Building 380. Use of the pipeline was discontinued in April 1990. The primary contaminants of concern (COCs) are total petroleum hydrocarbons (TPH). The VDEQ stated in a letter dated 13 December 1999 that no further corrective action was warranted at the Site. Remediation of Site ST-27 is considered complete. The Decision Document to formally close Site ST-27 was prepared and submitted to VDEQ. This document was signed on 27 July 2000. The collection sumps associated with this Site were properly abandoned in 2001.

ST-29: Abandoned USTs, Building 788. Site ST-29 is a series of eight fuel USTs located under the parking lot adjacent to Building 788 in an area of approximately 0.8 ac, in the southeastern portion of the base. Extensive fill (e.g., gravel, pavement) is present in the upper several feet around the USTs as a result of their installation. The primary COCs are TPH. The Interim Response Action was completed in 1991 to recover floating JP-4 fuel. A fuel recovery well was installed on the area of the plume to pump floating fuel into drums for disposal. Approximately 500 gallons (gal) of floating product were recovered from the groundwater. Remedial Action began in 1992 and was completed in 1994. The USTs were cleaned, filled with an inert material such as sand, and all openings were sealed. The Decision Document for No Further Action Required was prepared and submitted to VDEQ and signed on 4 April 2000.

ST-32: Abandoned UST, Building 753. Site ST-32 is a fuel-saturated area covering approximately 0.1 ac and the UST for fuel beneath the grassy area between Building 753 and Danforth Avenue, in the southeastern portion of JBLE-Langley. The Site consists of an abandoned 60,000-gal concrete fuel tank that is buried approximately 11 ft underground adjacent to the JP-4 pipeline. The UST was constructed in 1949 and stored No. 2 and No. 4 fuel oil. The fuel oil was used in Building 753's steam generation system. Site ST-32 is eligible for Air Force Environmental Restoration Account funding since the UST leaked prior to 1989, and the contamination is of a historical nature. The primary COCs are TPH. A Corrective Action Plan was prepared in 1991 in accordance with the guidance provided in the VDEQ Water Division Technical Standards and Corrective Action Requirements for USTs (VR 680-13-02) and federal UST regulations (40 CFR Part 280). The Corrective Action Plan recommended no remediation of contaminated soil or groundwater because a quantitative risk assessment concluded that the no action alternative adequately protects human health and the environment. Tank closure began in 1992 and was completed in 1993. VDEQ issued a closure letter on this Site dated 24 July 1996.

ST-33: Abandoned UST, Building 755. Site ST-33 includes a fuel saturated area covering approximately 0.1 ac and the UST for fuel beneath a grassy area between Building 755 and Danforth Avenue, in the southeastern portion of JBLE-Langley. The UST is an abandoned 60,000-gal concrete fuel tank that is buried approximately 11 ft below ground surface adjacent to the JP-4 pipeline. The UST was constructed in 1949 and was used to store No. 2 fuel oil. The fuel oil was used in Building 755's steam generation system. The primary COCs are TPH. The UST was filled with an inert material, and all openings were sealed to eliminate future use of the tank. Tank closure was completed in 1993. Monthly monitoring at Site ST-33 continued through February 1999. The results of the free product monitoring were summarized in a comprehensive report submitted to VDEQ in February 1999. The Decision Document for No Further Action Required was prepared and submitted to VDEQ and signed 4 April 2000.

Additionally, 16 Military Munitions Response Program (MMRP) sites have been identified at JBLE-Langley. Of the 16 sites, 11 are closed and 5 are in the process of a Feasibility Study. None are proximate to the Proposed Action facilities.

3.10.2.3 Asbestos and Lead-Based Paint

ACM includes materials that contain more than 1 percent asbestos; it is categorized as either friable or nonfriable. The 633 ABW Asbestos Management and Operations Plan (JBLE-Langley, 2017b) directs

how JBLE-Langley will carry out asbestos-related projects. An asbestos facility register is maintained by 633 CES. Persons inspecting, designing, or conducting asbestos response actions in public or commercial buildings must be properly trained and accredited through an applicable asbestos training program. The design of building alteration projects and requests for self-help projects are reviewed to determine if ACM is present in the proposed work area and, if so, is properly removed and disposed of in an off base permitted landfill (JBLE-Langley, 2016, 2017b). ACM has been found in Building 751 and includes hangar pipes with gray, corrugated pipes running the width of the wall; various floor tiles and mastic; and hot water pipe insulation in the men's room (JBLE-Langley, 2017b). There is no record of ACM in Building 790, but it was built after 2000 and is therefore unlikely to contain ACM.

LBP includes paint having lead levels equal to or exceeding 0.5 percent by weight. The 633 ABW maintained a Lead-Based Paint Management and Operations Plan with contained policies and procedures associated with the management of LBP until the housing at JBLE-Langley was privatized, and the Plan was discontinued[2]. Although there has never been a systematic evaluation of facilities other than housing and child-occupied buildings, as a matter of practice, older buildings at JBLE-Langley have been tested for LBP; however, neither Building 751 nor 790 have been tested for LBP[2]; however, Building 790 was built after 2000 and is very unlikely to contain LBP.

3.10.2.4 Radon

The USEPA radon zone for the Hampton Roads region and city of Hampton is Zone 3 (Low Potential, predicted indoor average level less than 2 pCi/L) (USEPA, 2018).

3.10.2.5 Polychlorinated Biphenyls

In addition to asbestos and lead, renovation activities have the potential to disturb PCBs. Fluorescent lighting fixture ballasts and transformers have the potential to contain PCBs. PCBs are regulated under TSCA as a RCRA Universal Waste (JBLE-Langley, 2016).

[2] David Jennings, 633 CES/CEIE, JBLE-Langley, Virginia, e-mail to Eric Webb, Ph.D., Technical Services Director, Vernadero Group, Inc., 26 October 2017.

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CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter presents a detailed analysis of the potential environmental impacts associated with the Proposed Action, alternatives, and No Action Alternative as described in **Chapter 2**. Impacts are described for each ROI previously described in **Chapter 3**. The specific criteria for evaluating impacts and assumptions for the analyses are presented under each resource area. Evaluation criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria. Proposed BMPs to reduce potential impacts are included for each resource area, as appropriate.

Impacts are defined in general terms and are qualified as adverse or beneficial and as short-term or long-term. For the purposes of this EA, short-term impacts are generally considered those impacts that would have temporary effects. Long-term impacts are generally considered those impacts that would result in permanent effects.

Impacts may be direct or indirect and are described in terms of type, context, duration, and intensity, which is consistent with the CEQ regulations. “Direct effects” are caused by an action and occur at the same time and place as the action. “Indirect effects” are caused by the action and occur later in time or are farther removed from the place of impact but are reasonably foreseeable.

Impacts are defined as

- negligible, the impact is localized and not measurable or at the lowest level of detection;
- minor, the impact is localized and slight but detectable;
- moderate, the impact is readily apparent and appreciable; or
- major, the impact is severely adverse or highly noticeable and considered to be significant.

Major impacts are considered significant and receive the greatest attention in the decision-making process. The significance of an impact is assessed based on the relationship between context and intensity. Major impacts require application of a mitigation measure to achieve a less than significant impact. Moderate impacts may not meet the criteria to be classified as significant, but the degree of change is noticeable and has the potential to become significant if not effectively mitigated. Minor impacts have little to no effect on the environment and are not easily detected; impacts defined as negligible are the lowest level of detection and generally not measurable. Beneficial impacts provide desirable situations or outcomes.

CEQ regulations (at 40 CFR § 1508.20) define mitigation in the following five ways, in order of preference:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

Direct and indirect effects and their significance, as well as the means (e.g., BMPs) for reducing adverse environmental impacts are also discussed for each resource. As described in **Section 2.6**, for the High Noise Scenario Proposed Action, mitigation measures are required to reduce impacts. These measures are described in **Section 4.2** and **Appendix E**. The potential impacts on each resource from the proposed mitigation was evaluated and described in each **Chapter 4** resource section.

4.1 AIRSPACE MANAGEMENT AND USE

4.1.1 *Evaluation Criteria*

Adverse impacts on airspace might include modifications to special use airspaces or significantly increasing flight operations within airspaces as a result of the Proposed Action and alternatives. For the purposes of this EA, an impact is considered significant if it modifies airspace location, dimensions, or aircraft operational capacity.

4.1.2 *Proposed Action*

Under the Proposed Action, an estimated 14 contract ADAIR aircraft would provide training sorties at JBLE-Langley and Warning Areas W-72, W-122, and W-386 as described in **Chapter 2**. An estimated additional 4,100 sorties would be added to the current number of sorties flown at JBLE-Langley. This number includes training sorties and a smaller number of sorties for aircraft leaving and returning from either maintenance or other deployments. The number of sorties within Warning Areas would increase by an estimated 4,000 sorties. Sorties in Warning Areas would include both subsonic and supersonic flight operation.

4.1.2.1 Alternatives 1 and 2

Implementation of alternatives differs only in the facilities chosen for operations, maintenance, and aircrew briefings. Because the number and type of aircraft, using the same flight profiles and airspace are the same under all alternatives, potential impacts on airspace management and use are the same for all action alternatives.

The addition of an estimated 4,100 sorties in the JBLE-Langley airspace increases the annual number of sorties by 25 percent. This change is not expected to impact the operational capacity or necessitate changes to airspace locations or dimensions of the airspace around JBLE-Langley. Potential impacts on the airspace around the airfield are expected to be negligible and long term.

There would be an increase of 4,000 annual training sorties in Warning Areas W-72, W-122, and W-386. This equates to a 29 percent increase in JBLE-Langley aircraft operations in these Warning Areas. Contract ADAIR would fly up to a projected 3 percent of the estimated 4,000 sorties during environmental night hours when the effects of aircraft noise are accentuated (10:00 pm to 7:00 am local time). This would increase Air Force flights at night by approximately 123 airspace operations per year, an increase of 83 percent of existing nighttime airspace sorties. Contractor night sorties would be flown during the Wing's approved flying window.

Time spent within the Warning Areas would depend upon the specific training mission performed but would typically last 45 to 60 minutes. Contractor operations would occur in these Warning Areas concurrent to the 1 FW and 192 WG or other supported Air Force units. No airspace modifications are included as part of the Proposed Action.

The vast majority of all aircraft operations in these airspaces are from US Navy aircraft. The Warning Areas proposed for use have the capacity, are in locations, and have the dimensions necessary to support the additional sorties proposed under Alternatives 1 and 2. Negligible impacts on airspace are expected from the implementation of Alternative 1 or 2.

4.1.2.2 Mitigation

The mitigation measures developed to reduce impacts from noise associated under the High Noise Scenario (described in **Section 4.2.2**) would not affect airspace and, therefore, have no impact on airspace management and use from implementation.

4.1.3 *No Action Alternative*

Under the No Action Alternative, contract ADAIR would not perform sorties at JBLE-Langley and nearby airspaces. Under the No Action Alternative, there would be no impacts on airspace.

4.2 NOISE

4.2.1 *Evaluation Criteria*

Noise impact analysis typically evaluates potential changes to existing noise environments that would result from implementation of the Proposed Action and alternatives. At the installation, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations. Areas beyond the 65-dBA DNL can also experience levels of appreciable noise depending upon training intensity or weather conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational tempo due to unit deployments, funding levels, and other factors. In the airspace, supersonic flight operations in the overwater Warning Areas are not expected to generate loud sonic booms on land.

Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels). Projected noise impacts were evaluated for the Proposed Action and alternatives.

4.2.2 *Proposed Action*

The Proposed Action includes contracting for the support of an estimated seven contractor aircraft to fly an estimated 4,100 annual sorties in support of the 1 FW and 192 WG at JBLE-Langley. This number of sorties also includes sorties expected for aircraft leaving for or returning from either maintenance or other deployments. Of the estimated 4,100 sorties, about 4,000 of those are the training sorties that would occur within the Warning Areas.

Because it is not known at this time what type of aircraft type would be used by contract ADAIR, three aircraft scenarios were evaluated (High, Medium, Low) to represent the range of aircraft types that could be selected. These scenarios are discussed further below. Depending on the specific type of contract ADAIR aircraft, impacts on the noise environment are expected to range from negligible to major and would be long-term.

Potentially significant impacts on the noise environment may be expected from the High Noise Scenario. No significant impacts are anticipated from the Medium or Low Noise Scenarios. Impacts from each alternative are summarized in **Table 4-1**, with details regarding impacts specific to the alternatives described in **Sections 4.2.2.1** through **4.2.2.3**.

4.2.2.1 Alternatives 1 and 2

Implementation of the Proposed Action would establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,000 annual training sorties at JBLE-Langley in Warning Areas W-72, W-122, and W-386.

Since the exact types of aircraft that ADAIR contractors would operate at JBLE-Langley is unknown, three scenarios were designed to provide a bounded analysis of potential impacts on the noise environment. The aircraft proposed for use by contract ADAIR and the surrogate aircraft modeled for the High, Medium, and Low Noise Scenarios are summarized in **Table 4-2**.

Table 4-1

Summary of Noise Impacts

Alternative	Change in Noise
Alternatives 1 and 2	High Noise Scenario – Long-term, minor noise increases (0 to 2 dBA) for most POIs as well as long-term, major noise increases (3 to 8 dBA) for a number of POIs resulting in potentially significant impacts from addition of contract ADAIR flight operations in the vicinity of the JBLE-Langley airfield. Impacts are primarily localized west of JBLE-Langley. Negligible increase in noise from additional contract ADAIR subsonic and/or supersonic flight operation in Warning Areas W-72, W-122, and W-386.
	Medium Noise Scenario – Long-term, negligible to moderate increases in noise from addition of contract ADAIR flight operations in the vicinity of the JBLE-Langley airfield. Impacts are primarily localized west of JBLE-Langley. Negligible increase in noise from additional contract ADAIR subsonic and/or supersonic flight operation in Warning Areas W-72, W-122, and W-386.
	Low Noise Scenario – Long-term, negligible to minor increases in noise from addition of contract ADAIR flight operations in the vicinity of the JBLE-Langley airfield. Impacts are primarily localized west of JBLE-Langley. Negligible increase in noise from additional contract ADAIR subsonic and/or supersonic flight operation in Warning Areas W-72, W-122, and W-386.
No Action	None

Notes:
ADAIR = adversary air; dBA = A-weighted decibel(s); JBLE-Langley = Joint Base Langley-Eustis, Langley Air Force Base; POI = point of interest

Table 4-2
Adversary Air Noise Scenarios

Scenario	Adversary Air Aircraft	Surrogate Aircraft
High Noise Scenario	Eurofighter Typhoon	F-18E/F
Medium Noise Scenario	Dassault Mirage	F-16C
Low Noise Scenario	JAS 39 Gripen	F-16A

To model changes in noise relative to the baseline conditions, all modeled contract ADAIR flight and engine run-up operations were set to the ADAIR aircraft listed in **Table 4-2** for the appropriate scenario. For example, when looking at the High Noise Scenario, all contract ADAIR operations are modeled as Eurofighter Typhoon operations; however, the NOISEMAP database does not contain noise data for the Eurofighter Typhoon, so an appropriate noise modeling surrogate was selected, the F-18E/F in this case. The noise modeling surrogates for various aircraft presented in **Table 4-2** have been approved for use by the Air Force Civil Engineer Center (AFCEC) CZN (NEPA Division) and CPPR (Noise and Air Installation Compatible Use Zone Division). Flight profiles for contract ADAIR (i.e., schedules of altitude, power setting, and airspeed along each flight track) were reviewed and approved by the operators at JBLE-Langley and ACC. The representative flight profiles for the various contract ADAIR scenarios are provided in **Appendix B**. All contract ADAIR departure profiles were modeled using afterburner or the maximum possible power on all takeoffs.

High Noise Scenario

Under the High Noise Scenario, all contract ADAIR operations are assumed to be performed by Eurofighter Typhoon aircraft. Since noise data for the Eurofighter Typhoon are not available in NOISEMAP, the F-18E/F was used as a modeling surrogate. Proposed contract ADAIR flight operations at JBLE-Langley and

associated airspaces would be identical to existing conditions except for the additional contract ADAIR sorties. Noise analysis of the High Noise Scenario was conducted to analyze changes to the airfield noise contours and the proposed airspaces.

Joint Base Langley-Eustis, Langley Air Force Base Noise Environment

Implementation of the Proposed Action would result in a 25 percent increase in the number of operations at JBLE-Langley. Contract ADAIR would fly up to a projected 3 percent of the estimated total 4,100 additional sorties during environmental night hours when the effects of aircraft noise are accentuated (10:00 pm to 7:00 am local time). This equates to an increase of approximately 123 sorties per year, an 83 percent increase above existing night sorties. Contractor night sorties would be flown during the Wing's approved flying window. Runway utilization, flight tracks, and flight track utilization for contract ADAIR aircraft would be similar to the existing F-22 operations. Proposed annual departure, arrival, and closed pattern aircraft operations at JBLE-Langley with the addition of contract ADAIR are summarized in **Table 4-3**. Contract ADAIR would also perform static run-up operations, such as pre- and post-flight run-ups.

Table 4-3
Proposed Annual Aircraft Operations Summary at Joint Base Langley-Eustis, Langley Air Force Base

Aircraft	Departures		Arrivals		Closed Patterns		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
F-22	7,485	73	7,407	151	7,561	-	22,453	224	22,677
T-38A/B	4,000	-	4,000	-	8,000	-	16,000	-	16,000
ADAIR	3,977	123	3,977	123	1,107	-	9,061	246	9,307
NASA	561	6	561	6	-	-	1,122	12	1,134
Transients	1,070	30	1,070	30	-	-	2,140	60	2,200
Grand Total	**17,093**	**232**	**17,015**	**310**	**16,668**	**-**	**50,776**	**542**	**51,318**

Notes:
ADAIR = adversary air; NASA = National Aeronautics and Space Administration

As described in **Section 3.2.1.2**, NOISEMAP was used to model military aircraft noise. The resultant 65- to 85-dBA DNL contours in 5-dBA increments for the daily flight events at JBLE-Langley under the proposed High Noise Scenario are summarized on **Figure 4-1**. The 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations.

The primary changes in noise contour features between the High Noise Scenario and the existing conditions would be the elongation of the DNL contours along the extended centerline of Runway 08/26 and the slight expansion perpendicular to the runway. The dominant factor in this increase is from contract ADAIR straight-in arrivals. The noise level generated by High Noise Scenario contract ADAIR aircraft maintaining a three degree glideslope and operating under approach power conditions is substantially greater that the noise level generated by based F-22 aircraft operating under similar conditions. A comparison of the DNL noise contours of the High Noise Scenario and the existing conditions is shown on **Figure 4-2**, and the change in area within noise contours as a result of the High Noise Scenario is shown in **Table 4-4**.

As a result of the implementation of the High Noise Scenario, noise levels at representative POIs described in **Section 3.2.2** would increase (**Table 4-5**).

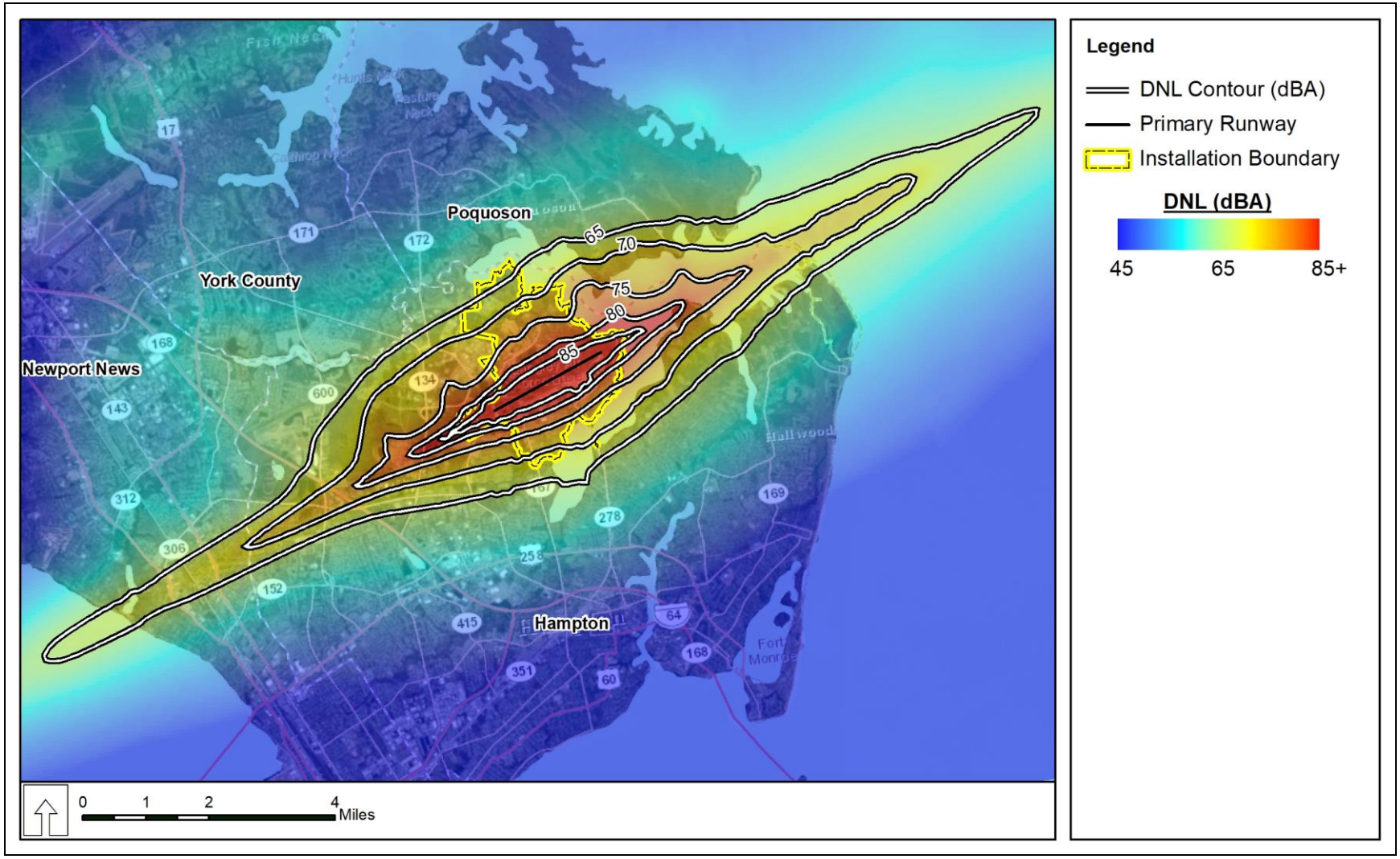


Figure 4-1. High Noise Scenario Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

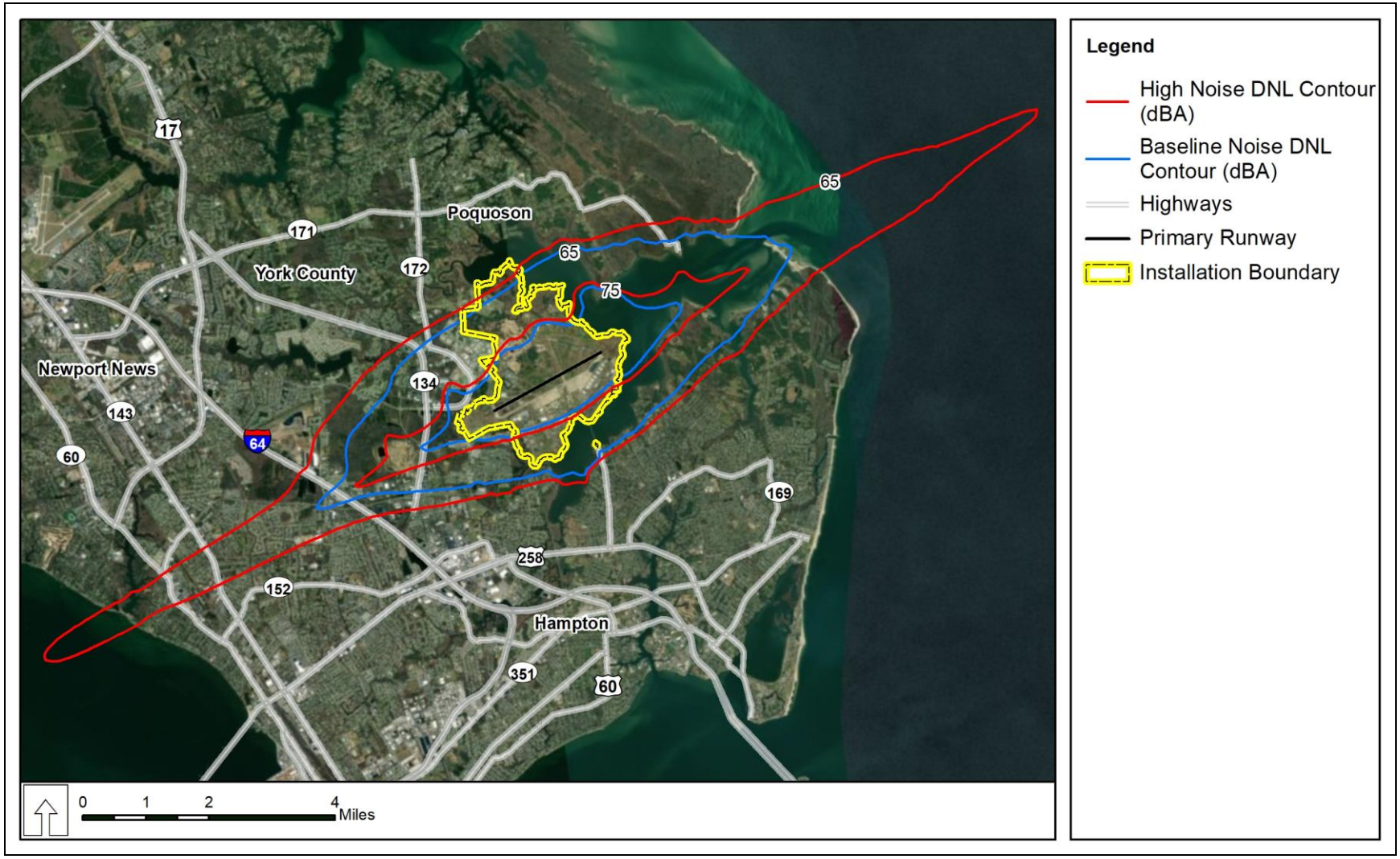


Figure 4-2. Comparison of High Noise Scenario and Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

Table 4-4
Proposed High Noise Scenario Day-Night Average Sound Level Area Affected on and Surrounding Joint Base Langley-Eustis, Langley Air Force Base

Noise Level (dBA DNL)	Area Within Noise Contour (acres)		
	Existing	High Noise Scenario	Increase
>65	10,524	16,939	6,415
>70	5,778	8,487	2,709
>75	2,707	3,763	1,056
>80	1,149	1,585	436
>85	555	698	143

Notes:
dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level

Table 4-5
Proposed High Noise Scenario Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

POIs		DNL (dBA)		
ID	Description	Existing	High Noise Scenario	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	71	2
H02	Langley Air Force Base Hospital	75	76	1
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	65	2
R01	Residential #1, Fox Hill	62	64	2
R02	Residential #2, Poquoson	67	70	3
R03	Residential #3, Michael's Woods	63	71	8
R04	Residential #4, Mobile Home Park West Gate	77	79	2
R05	Residential #5, Mobile Home Park Langley Speedway	74	75	1
R06	Residential #6, Langley Air Force Base Officer's Housing	76	78	2
R07	Residential #7, Enlisted Base Housing	77	79	2
S01	Hampton Christian Academy	60	62	2
S02	Machen Elementary School	70	72	2
S03	New Horizons Regional Education Center	67	73	6
S04	Paul Burbank Elementary School	60	62	2
S05	Peninsula Catholic School	53	57	4
S06	Thomas Nelson Community College	67	75	8
S07	Watkins Early Childhood Center	52	57	5
S08	William Mason Cooper Elementary School	59	61	2
W01	Emmanuel Lutheran Church	66	69	3
W02	Faith Baptist Church	65	69	4
W03	Langley Air Force Base Chapel	74	75	1
W04	Sharon Baptist Church	65	67	2

Notes:
Affected POIs based off NOISEMAP modeled noise contours and used to calculate the POIs within each noise contour.
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

At the representative noise sensitive locations modeled, the DNL would increase by an amount ranging from the 1- to 8-dBA DNL under the High Noise Scenario.

DNL increases greater than 3 dBA would be clearly noticeable and may increase human annoyance. If unmitigated, impacts from a greater-than-3-dBA DNL increase would be potentially significant. A total of

five POIs would have a greater-than-3-dBA DNL increase and three POIs would have a 3-dBA DNL increase under the High Noise Scenario. Fifteen POIs examined would experience negligible to minor DNL increases of 0 to 2 dBA. The increased DNL at these POIs and the surrounding areas would be long term, barely noticeable, and not significant under Alternatives 1 and 2.

Airspace Noise Environment

Under the High Noise Scenario, contract ADAIR would perform an estimated 4,000 annual operations in the special use airspace. Contract ADAIR would only operate in the same Warning Areas already used by based JBLE-Langley aircraft. W-386 receives approximately 90 percent of all airspace operations originating from JBLE-Langley while W-72 and W-122 receive approximately 5 percent each. A summary of annual airspace operations is presented in **Table 4-6**.

Table 4-6
Proposed Annual Airspace Operations Summary by Joint Base Langley-Eustis, Langley Air Force Base in Warning Areas W-72, W-122, and W-386

Aircraft	W-72		W-122		W-386		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
F-22	367	12	367	12	6,604	205	7,338	229	7,568
T-38A/B	174	0	174	0	3,118	0	3,466	0	3,466
Adversary Air	194	6	194	6	3,492	108	3,880	120	4,000
Large Force Exercise	0	0	48	0	0	0	48	0	48
Grand Total	**735**	**18**	**783**	**18**	**13,214**	**313**	**14,732**	**349**	**15,082**

As previously discussed in **Sections 3.1.2** and **3.2.3**, aircraft operations from the US Navy make up the vast majority of total air operations in W-72, W-122, and W-386[1]. The increase in airspace operations from contract ADAIR in these Warning Areas would be less than significant to the overall noise environment given the disparity between number of US Navy operations and Air Force operations.

Single event sonic boom levels were estimated, using the PCBoom program described in **Section 3.2.1.2**, directly undertrack for the F-22 and T-38A/B aircraft at various altitudes and Mach numbers. The single event levels reported include Overpressure (psf) and CSEL in decibels. Sonic boom levels estimated for contract ADAIR supersonic flights in Warning Areas W-72, W-122, and W-386 are shown on **Table 4-6** along with the F-22 and T-38A boom levels for comparison. Sonic boom levels are only shown for the ADAIR High Noise Scenario which uses the supersonic Eurofighter Typhoon, Dassault Mirage, and JAS 39 Gripen aircraft.

The sonic boom levels shown on **Table 4-7** are the loudest levels computed at the center of the footprint for the constant Mach, level flight conditions indicated. Supersonic flights in Warning Areas W-72, W-122, and W-386 occur at high altitudes and are expected to occur more than 15 NM from the coast. The location of these booms would vary with changing flight paths and weather conditions, so it is unlikely that any given location would experience these undertrack levels more than once over multiple events. Overpressure levels, directly under the flight path, estimated for these airspaces would range from 6.2 to 0.9 psf depending on the flight conditions. In general, public reaction (limited to vessels 15 NM from shore) may occur with overpressures above 1 psf, and in rare instances, damage to structures have occurred at overpressures between 2 and 5 psf (NASA, 2017b). People located farther away from the supersonic flight paths, who are still within the primary boom carpet, might also be exposed to levels that may be startling or annoying, but the probability of this decreases the farther away they are from the flight path. Populated areas on the coast are not expected to be exposed to levels that would be startling or annoying although post-boom rumbling sounds may be heard. The addition of contractor aircraft operating at supersonic speeds means that the number of sonic booms would increase; however, potential impacts associated with sonic booms are still expected to be negligible under Alternatives 1 and 2.

Table 4-7
Warning Areas W-72, W-122, and W-386: Sonic Boom Levels Undertrack for Adversary Air Aircraft in Level Flight at Mach 1.2 and 1.5

Aircraft	Altitude (feet above mean sea level)			
	10,000	20,000	30,000	40,000
Mach 1.2				
Overpressure (psf)				
F-22	5.4	2.8	1.9	1.4
T-38A/B	3.3	1.8	1.2	0.9
Eurofighter Typhoon[1]	5.1	2.7	1.8	1.4
Dassault Mirage[2]	4.2	2.2	1.5	1.1
JAS 39 Gripen[3]	4.2	2.2	1.5	1.1
C-Weighted Sound Exposure Level (dB)[1]				
F-22	116	111	107	105
T-38A/B	112	107	103	101
Eurofighter Typhoon[1]	116	110	107	105
Dassault Mirage[2]	114	109	105	103
JAS 39 Gripen[3]	114	109	105	103
Mach 1.5				
Overpressure (psf)				
F-22	6.2	3.2	2.1	1.5
T-38A/B	3.8	2.0	1.3	0.9
Eurofighter Typhoon[1]	5.9	3.1	2.0	1.5
Dassault Mirage[2]	4.9	2.5	1.6	1.2
JAS 39 Gripen[3]	4.9	2.5	1.6	1.2
C-Weighted Sound Exposure Level (dB)[1]				
F-22	117	112	108	105
T-38A/B	113	108	104	101
Eurofighter Typhoon[1]	117	111	108	105
Dassault Mirage[2]	115	110	106	103
JAS 39 Gripen[3]	115	110	106	103

Notes:
[1] As modelled with the surrogate F-18E/F
[2] As modelled with the surrogate F-16C
[3] As modelled with the surrogate F-16A

C-weighted Sound Exposure Level – Sound Exposure Level with frequency weighting that places more emphasis on low frequencies below 1,000 hertz

dB = decibel(s); psf = pound(s) per square foot

Medium Noise Scenario

Under the Medium Noise Scenario, all contract ADAIR operations are assumed to be performed by Dassault Mirage aircraft. Since noise data for the Dassault Mirage are not available in NOISEMAP, the F-16C was used as a modeling surrogate. Proposed flight operations at JBLE-Langley and associated Warning Areas would be identical to existing conditions except for the additional contract ADAIR sorties. Noise analysis of the Medium Noise Scenario was conducted to analyze changes to the airfield noise contours and assess noise changes in the proposed airspaces.

Joint Base Langley-Eustis, Langley Air Force Base Noise Environment

Under the Medium Noise Scenario, contract ADAIR would perform the same operations as outlined under the High Noise Scenario in **Section 4.2.3.1** (see **Table 4-4**). As such, the increase in the total number of operations and increase in night sorties, runway utilization, flight tracks, and flight track utilization would also be the same as described in the High Noise Scenario.

NOISEMAP was used to model military aircraft noise. The resultant 65- to 85-dBA DNL contours in 5-dBA increments for the existing daily flight events at JBLE-Langley are shown on **Figure 4-3**. The primary changes in noise contour features between the Medium Noise Scenario and the existing conditions would be the slight elongation of the DNL contours along the extended centerline of Runway 08/26 and the slight expansion perpendicular to the runway. This overall increase in noise level is a result of contract ADAIR departures, pitch arrivals, and closed pattern flight operations. A comparison of the DNL noise contours of the Medium Noise Scenario and the existing conditions is shown on **Figure 4-4**.

Under the Medium Noise Scenario, the amount of area within noise contours would increase (**Table 4-8**). These increases would not lead to significant impacts in these areas.

As a result of the implementation of the Medium Noise Scenario, noise levels at representative POIs described in **Section 3.2.3** would increase (**Table 4-9**). At the representative noise-sensitive locations modeled, the DNL would increase by an amount ranging from 0 to 2 dBA under the Medium Noise Scenario. As such, all representative POIs examined would experience negligible to minor impacts from DNL increases of 0 to 2 dBA. The negligible to minor impacts on these POIs and the surrounding areas would be long-term, barely noticeable, and not significant under Alternatives 1 and 2.

Airspace Noise Environment

Under the Medium Noise Scenario, the subsonic and/or supersonic airspace noise environment would be practically identical to the subsonic and/or supersonic airspace noise environment under the High Noise Scenario described in **Section 4.2.3.1**. The aircraft proposed in the Medium Noise Scenario are slightly quieter than those used in the High Noise Scenario, which was determined to have no significant impacts; as such, there would be no significant impacts under the quieter Medium Noise Scenario (see **Table 4-6**) under Alternatives 1 and 2.

Low Noise Scenario

Under the Low Noise Scenario, all contract ADAIR operations would be performed by JAS 39 Gripen aircraft. Since noise data for the JAS 39 Gripen are not available in NOISEMAP, the F-16A was used as a modeling surrogate. Proposed contract ADAIR flight operations at JBLE-Langley and associated airspaces would be identical to existing conditions except for the additional contract ADAIR sorties. Noise analysis of the Low Noise Scenario was conducted to analyze changes to the airfield noise contours and the proposed airspaces.

Joint Base Langley-Eustis, Langley Air Force Base Noise Environment

Under the Low Noise Scenario, contract ADAIR would perform the same operations as outlined under the High Noise Scenario in **Section 4.2.3.1** (see **Table 4-4**). As such, the increase in the total number of operations and increase in night sorties, runway utilization, flight tracks, and flight track utilization would also be the same as described in the High Noise Scenario.

NOISEMAP was used to model military aircraft noise. The resultant 65- to 85-dBA DNL contours in 5-dBA increments for the existing daily flight events at JBLE-Langley are shown on **Figure 4-5**. The primary changes in noise contour features between the Low Noise Scenario and the existing conditions would be the elongation of the DNL contours along the extended centerline of Runway 08/26 and the slight expansion perpendicular to the runway. This overall increase in noise level would be a result of contract ADAIR departures, straight-in arrivals, and closed pattern flight operations. A comparison of the DNL noise contours of the Low Noise Scenario and the existing conditions is shown on **Figure 4-6**.

The area within each DNL noise contour band for both the existing conditions and the Low Noise Scenario is shown in **Table 4-10**. These increases are not expected to lead to significant impacts in these areas.

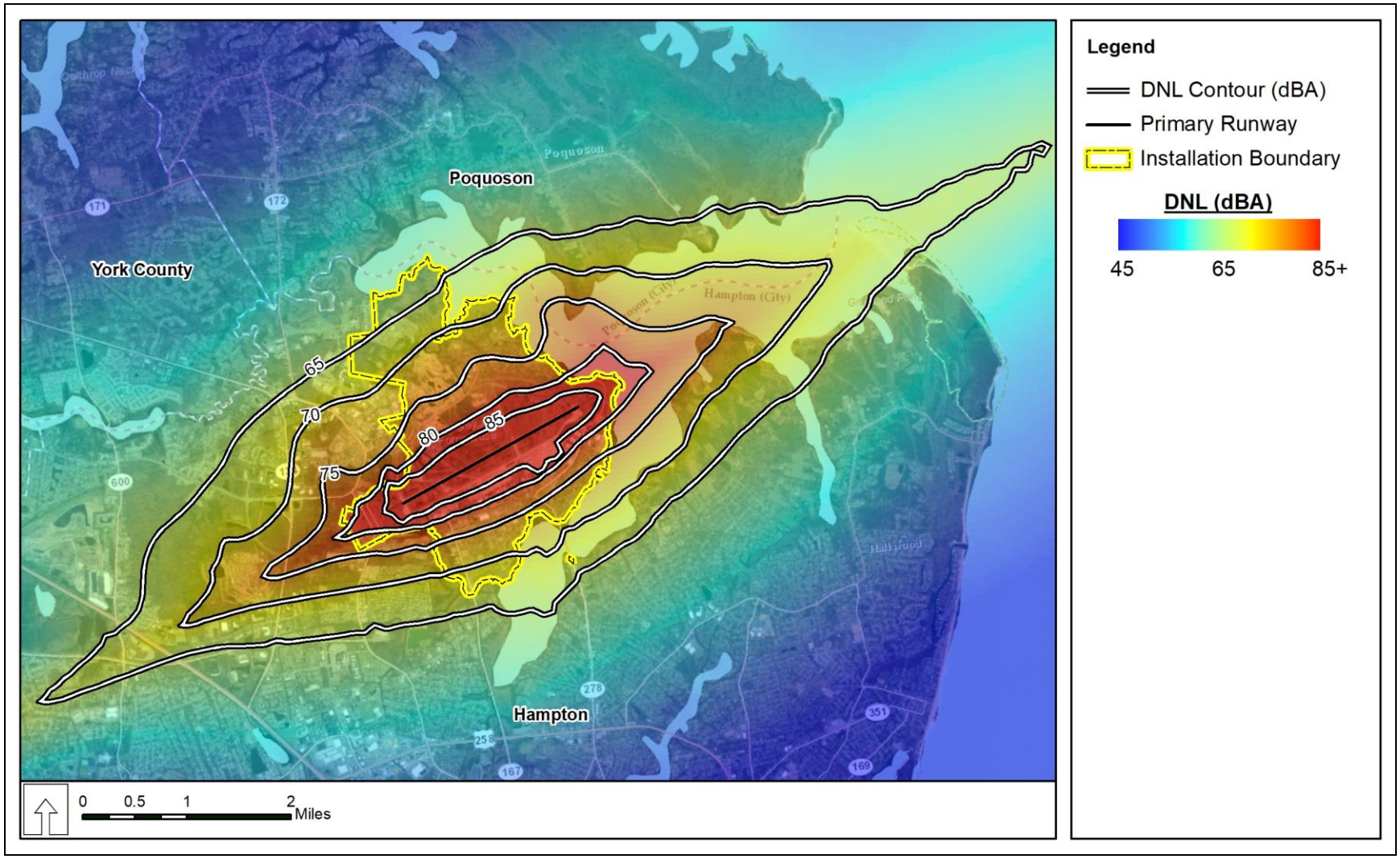


Figure 4-3. Medium Noise Scenario Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

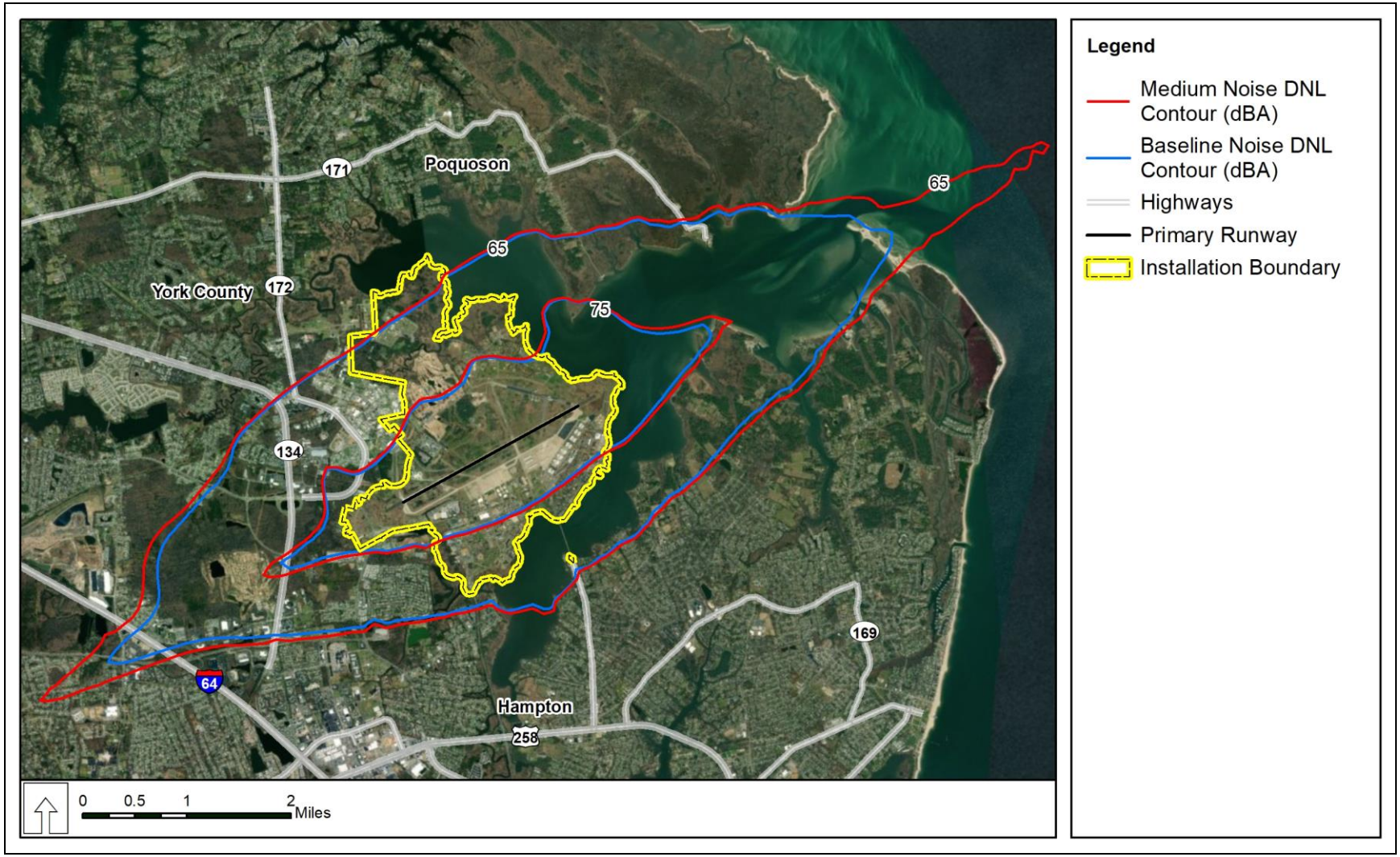


Figure 4-4. Comparison of Medium Noise Scenario and Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

Table 4-8
Proposed Medium Noise Scenario Day-Night Average Sound Level Area Affected on and Surrounding Joint Base Langley-Eustis, Langley Air Force Base

Noise Level (dBA DNL)	Area Within Noise Contour (acres)		
	Existing	Medium Noise Scenario	Increase
>65	10,524	11,621	1,097
>70	5,778	6,247	469
>75	2,707	2,923	216
>80	1,149	1,241	92
>85	555	589	34

Notes:
dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level

Table 4-9
Proposed Medium Noise Scenario Day-Night Average Sound Level at Representative Points of Interest on and Near Joint Base Langley-Eustis, Langley Air Force Base

POIs		DNL (dBA)		
ID	Description	Existing	Medium Noise Scenario	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	70	1
H02	Langley Air Force Base Hospital	75	75	0
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	74	0
H04	Sentara Hospital	63	64	1
R01	Residential #1, Fox Hill	62	63	1
R02	Residential #2, Poquoson	67	67	0
R03	Residential #3, Michael's Woods	63	65	2
R04	Residential #4, Mobile Home Park West Gate	77	77	0
R05	Residential #5, Mobile Home Park Langley Speedway	74	74	0
R06	Residential #6, Langley Air Force Base Officer's Housing	76	77	1
R07	Residential #7, Enlisted Base Housing	77	78	1
S01	Hampton Christian Academy	60	60	0
S02	Machen Elementary School	70	70	0
S03	New Horizons Regional Education Center	67	69	2
S04	Paul Burbank Elementary School	60	61	1
S05	Peninsula Catholic School	53	54	1

Table 4-9
Proposed Medium Noise Scenario Day-Night Average Sound Level at Representative Points of Interest on and Near Joint Base Langley-Eustis, Langley Air Force Base

POIs		DNL (dBA)		
ID	Description	Existing	Medium Noise Scenario	Increase in DNL
S06	Thomas Nelson Community College	67	69	2
S07	Watkins Early Childhood Center	52	54	2
S08	William Mason Cooper Elementary School	59	59	0
W01	Emmanuel Lutheran Church	66	66	0
W02	Faith Baptist Church	65	66	1
W03	Langley Air Force Base Chapel	74	74	0
W04	Sharon Baptist Church	65	65	0

Notes:

Affected POIs based off NOISEMAP modeled noise contours and used to calculate the POIs within each noise contour.

dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

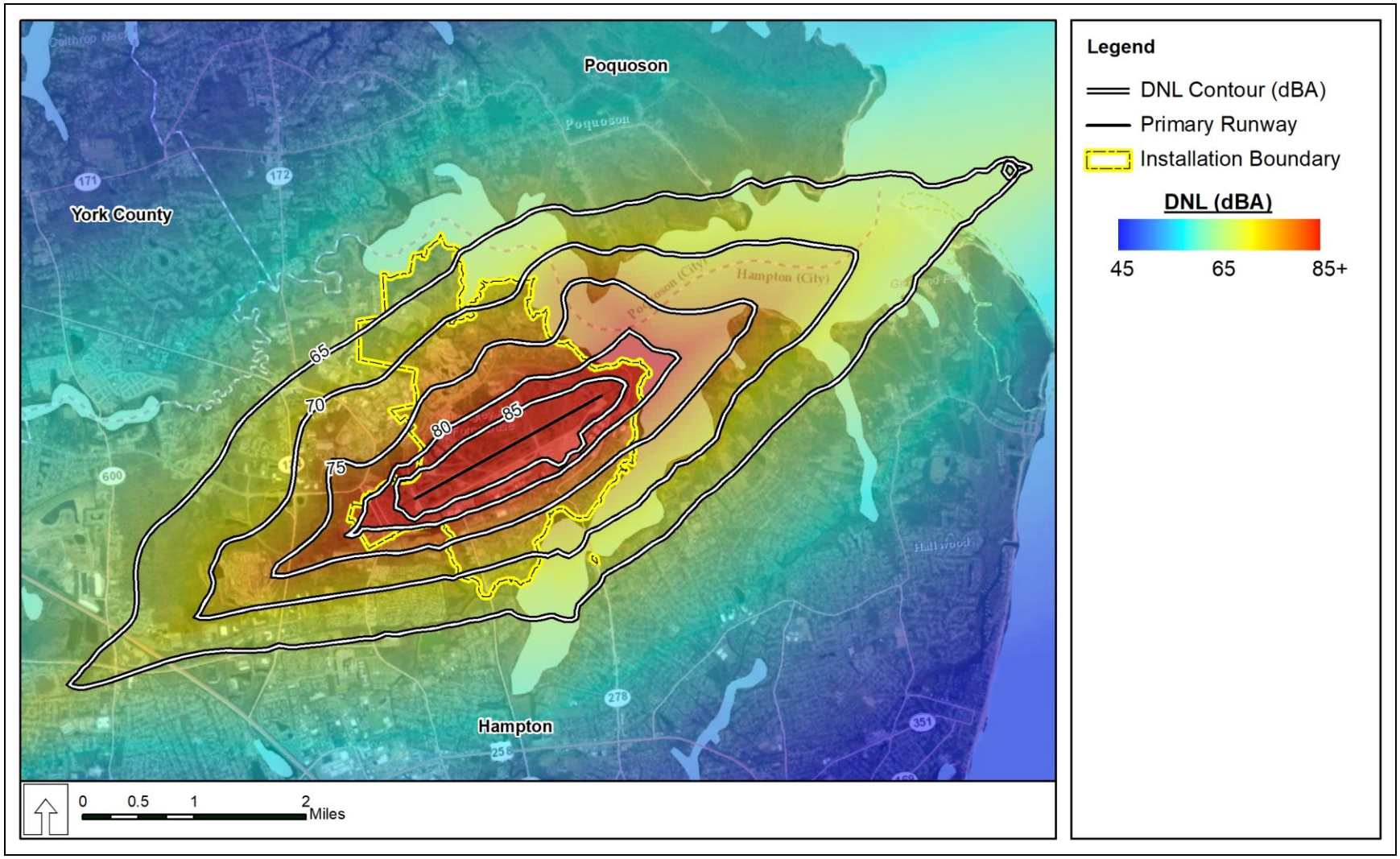


Figure 4-5. Low Noise Scenario Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

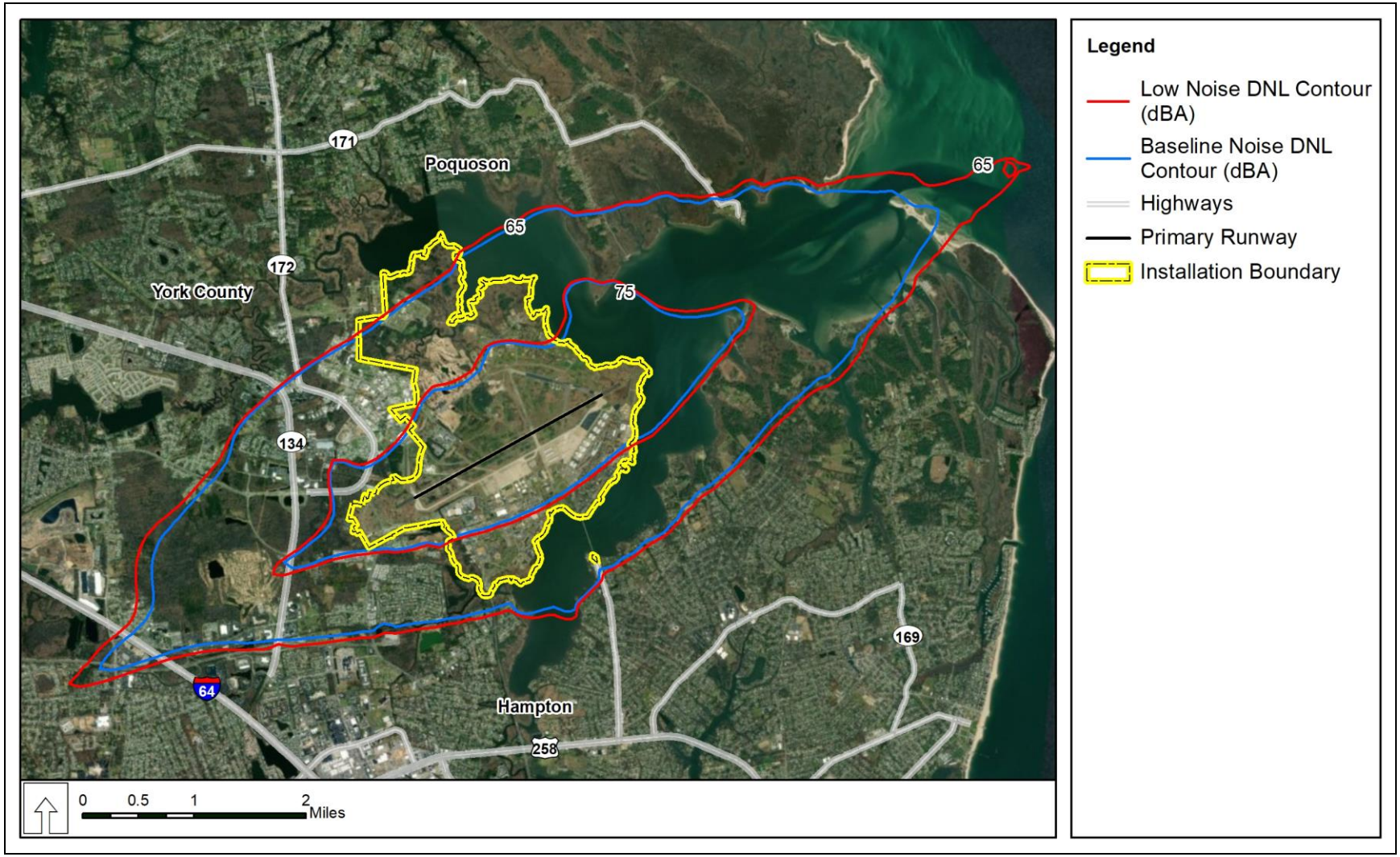


Figure 4-6. Comparison of Low Noise Scenario and Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

Table 4-10
Proposed Low Noise Scenario Day-Night Average Sound Level Area Affected on and Surrounding Joint Base Langley-Eustis, Langley Air Force Base

Noise Level (dBA DNL)	Area Within Noise Contour (acres)		
	Existing	Low Noise Scenario	Increase
>65	10,524	11,439	915
>70	5,778	6,244	466
>75	2,707	2,945	238
>80	1,149	1,249	100
>85	555	599	44

Notes:
dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level

As a result of the implementation of the Low Noise Scenario, noise levels at representative POIs identified in **Section 3.2.2** would increase (**Table 4-11**). At the representative noise-sensitive locations studied, the DNL would increase by an amount ranging from 0 to 2 dBA under the Low Noise Scenario. All POIs examined would experience negligible to minor impacts due to DNL increases of 0 to 2 dBA. The negligible to minor impacts on these POIs, and the areas surrounding them would be long-term, barely noticeable, and less than significant under Alternatives 1 and 2.

Table 4-11
Proposed Low Noise Scenario Day-Night Average Sound Level at Representative Points of Interest on and Near Joint Base Langley-Eustis, Langley Air Force Base

POIs		DNL (dBA)		
ID	Description	Existing	Low Noise Scenario	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	70	1
H02	Langley Air Force Base Hospital	75	75	0
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	64	1
R01	Residential #1, Fox Hill	62	63	1
R02	Residential #2, Poquoson	67	67	0
R03	Residential #3, Michael's Woods	63	64	1
R04	Residential #4, Mobile Home Park West Gate	77	77	0
R05	Residential #5, Mobile Home Park Langley Speedway	74	74	0
R06	Residential #6, Langley Air Force Base Officer's Housing	76	77	1
R07	Residential #7, Enlisted Base Housing	77	78	1
S01	Hampton Christian Academy	60	60	0
S02	Machen Elementary School	70	70	0
S03	New Horizons Regional Education Center	67	68	1
S04	Paul Burbank Elementary School	60	61	1
S05	Peninsula Catholic School	53	54	1
S06	Thomas Nelson Community College	67	68	1
S07	Watkins Early Childhood Center	52	54	2
S08	William Mason Cooper Elementary School	59	60	1
W01	Emmanuel Lutheran Church	66	66	0
W02	Faith Baptist Church	65	66	1
W03	Langley Air Force Base Chapel	74	74	0
W04	Sharon Baptist Church	65	65	0

Notes:
Affected POIs based off NOISEMAP modeled noise contours and used to calculate the POIs within each noise contour.
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

At the representative noise-sensitive locations modeled, the DNL would increase by an amount ranging from 0 to 1 dBA under the Low Noise Scenario. All representative POIs examined would experience negligible to minor impacts from DNL increases of 0 to 1 dBA. The negligible to minor impacts on these POIs and the surrounding areas would be long-term, barely noticeable, and not significant.

Airspace Noise Environment

Under the Low Noise Scenario, the subsonic and/or supersonic airspace noise environment would be practically identical to the subsonic and/or supersonic airspace noise environment under the High Noise Scenario described in **Section 4.2.3.1**. The aircraft proposed under the Low Noise Scenario are slightly quieter than those proposed for the High Noise Scenario. Since there was a determination of no significant impacts under the High Noise Scenario, there would be no significant impacts under the quieter Low Noise Scenario (see **Table 4-6**) under Alternatives 1 and 2.

4.2.2.2 Mitigation

Noise analyses conducted for the Proposed Action (**Section 4.2.2**) indicate that the noise exposure at JBLE-Langley may increase significantly with the proposed addition of contract ADAIR flight training operations under the High Noise Scenario and specifically for the straight-in arrival operations by these High Noise Scenario aircraft; therefore, to reduce the potentially significant impacts from noise on POIs under the High Noise Scenario, operational noise mitigation studies were conducted with a goal of reducing noise at the POIs in the vicinity of the airfield so that no POIs experience a greater-than-3-dBA DNL increase as a result of the Proposed Action. While a change of a 3-dBA DNL would be clearly noticeable by the average human ear (Federal Interagency Committee on Noise, 1992), this change can be equivalent to a doubling of noise levels from flight operations for people near and around the airfield. DNL increases of greater than 3 dBA would be clearly noticeable and may increase human annoyance. A greater-than-3-dBA DNL increase was used as a threshold in this EA as the point where further consideration may be warranted. If unmitigated, these noise impacts would be major and could be potentially significant. Because the specific mix of aircraft to be used by contract ADAIR is unknown, the range of potential impacts was bounded by the scenarios chosen for analysis (High, Medium, and Low). The ultimate need for mitigation would be determined by the actual aircraft used for contract ADAIR if the High Noise Scenario is implemented. This section describes the noise mitigation studies conducted for JBLE-Langley, including the mitigation scenarios that were successful in achieving the desired noise reduction that could be applied in practice. The recommended mitigation option is then described based on these analyses. A mitigation and monitoring plan is included as **Appendix E.**

After a review of potential mitigation measures for JBLE-Langley, the Air Force selected four measures that are viable for safety, training goals, and implementation practicability. These four noise mitigation measures are described in **Table 4-12**. It was noted that the noise increase due to the proposed contract ADAIR High Noise aircraft is primarily due to the straight-in arrival operations; therefore, the noise mitigation options in **Table 4-12** focus mainly on reducing these straight-in arrivals and increasing overhead break arrivals to redistribute noise around the airfield to achieve successful noise mitigation. Noise Mitigation Options 2, 3, and 4 include changes to arrival flight paths only whereas Option 1 includes changes to arrival flight paths during environmental night (10:00 pm to 7:00 am). Noise Mitigation Options 1, 2, 3, and 4 can be exercised individually or in combination if additional noise reduction is required. Neither Options 2 and 3 nor Options 3 and 4 could occur concurrently. From the combination of these four mitigation measures, five different scenarios (shown in **Table 4-13**) that involve either an individual measure or a combination of measures were tested. Operational leadership will implement these mitigation measures in a manner consistent with safety of flight and mission necessity.

As noted before, reducing straight in arrivals and/or straight in arrivals that occur during environmental night comprise all of the scenarios tested. All scenarios were tested by making the noted change to the Proposed Action noise model and evaluating the resulting DNL at each POI. Of the five scenarios tested, two scenarios (2 and 5) were successful in achieving noise reduction around the airfield such that noise increases were limited to 3-dBA DNL or less at all representative POIs except one. The S07 POI (Watkins Early Childhood Center) experiences a 4-dBA DNL increase under the Proposed Action and all mitigation

scenarios; however, this POI is outside of the 60-dBA DNL contour under all scenarios. As described in **Section 3.2.2**, in accordance with AFH 32-7084, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations.

Table 4-12
Noise Mitigation Options Tested at Points of Interest at Joint Base Langley-Eustis, Langley Air Force Base

Option	Description	Detailed Option Change
1	Reduce percent of straight-in arrivals that occur during environmental night (10:00 pm to 7:00 am).	Currently, 3% of ADAIR straight-in arrivals occur between 10:00 pm and 7:00 am. Reduce this to 2% during environmental night (10:00 pm to 7:00 am) and 98% during environmental day (10:00 pm to 7:00 am).
2	Reduce straight-in arrivals on Runway 08, increase straight-in arrivals on Runway 26.	Currently, ADAIR straight-in arrivals are 60% on Runway 08 and 40% on Runway 26. Change this to zero on Runway 08 and 100% on Runway 26.
3	Launch on Runway 08 and land on Runway 26 exclusively (no flights to the north).	Change ADAIR departures to 100% on Runway 08 and change arrivals to 100% on Runway 26 (to all arrival types).
4	Reduce straight-in arrivals on Runways 08 and 26 and increase overhead break arrivals on Runways 08 and 26.	Current arrival type utilization: 25% straight-in, 19% overhead break, 56% tactical. Change utilization to zero straight-in, 44% overhead break, and 56% tactical.

Note:
ADAIR = adversary air

Table 4-13
Five Noise Mitigation Scenarios Tested as a Result of Combining the Four Noise Mitigation Options

Scenario	Combination of Options	Description of Scenario
1	Option 1 Only	Reduce ADAIR environmental night straight-in arrivals.
2	Option 2 Only	Reduce straight-in arrivals on Runway 08 by increasing straight-in arrivals on Runway 26.
3	Option 3 Only	Launch on Runway 08 and recover on Runway 26.
4	Option 4 Only	Reduce straight-in arrivals on Runways 08 and 26 by increasing overhead breaks and tactical arrivals on Runways 08 and 26.
5	Option 1 and 2	Reduce acoustic night straight-in arrivals; reduce straight-in arrivals on Runway 08 by increasing straight-in arrivals on Runway 26.

The noise mitigation results for Scenarios 2 and 5, which were the only two that were successful in meeting the noise reduction criterion (i.e., less than a 3-dBA DNL increase at all POIs), are shown in the following sections. The recommended noise mitigation option for JBLE-Langley is discussed last and based on Mitigation Scenario 4, which achieves the necessary noise reduction around the airfield while also being the most practical of the four candidate scenarios to implement.

Mitigation Scenario 2

The modeled action for Noise Mitigation Scenario 2 was to eliminate contract ADAIR straight-in arrivals on Runways 08 by increasing contract ADAR straight-in arrivals on Runway 26. **Table 4-14** and **Figure 4-7** show the Noise Mitigation Scenario 2 DNL results and the increase above the baseline DNL. Under Noise Mitigation Scenario 2, the DNL increase at each POI would be limited to 3 dBA or less (except for POI S07, Watkins Early Childhood Center).

Table 4-14
Noise Mitigation Scenario 2 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

POI		DNL (dBA)		
ID	Description	Existing	Mitigation Scenario 2	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	71	2
H02	Langley Air Force Base Hospital	75	76	1
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	65	2
R01	Residential #1 - Fox Hill	62	64	2
R02	Residential #2 - Poquoson	67	69	2
R03	Residential #3 - Michael's Woods	63	64	1
R04	Residential #4 - Mobile Home Park West Gate	77	78	1
R05	Residential #5 - Mobile Home Park Langley Speedway	74	75	1
R06	Residential #6 - Langley Air Force Base Officer's Housing	76	78	2
R07	Residential #7 - Enlisted Base Housing	77	79	2
S01	Hampton Christian Academy	60	61	1
S02	Machen Elementary School	70	71	1
S03	New Horizons Regional Education Center	67	69	2
S04	Paul Burbank Elementary School	60	62	2
S05	Peninsula Catholic School	53	56	3
S06	Thomas Nelson Community College	67	68	1
S07	Watkins Early Childhood Center	52	56	4
S08	William Mason Cooper Elementary School	59	61	2
W01	Emmanuel Lutheran Church	66	69	3
W02	Faith Baptist Church	61	64	3
W03	Langley Air Force Base Chapel	74	75	1
W04	Sharon Baptist Church	65	66	1

Notes:
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

Mitigation Scenario 5

The modeled action for Noise Mitigation Scenario 5 was to reduce contract ADAIR acoustic night operations from 3 to 2 percent and to reduce contract ADAIR straight-in arrivals to Runways 08 by 75 percent by increasing straight-in arrivals on Runway 26. **Table 4-15** and **Figure 4-8** show the Noise Mitigation Scenario 5 DNL results and the increase above the baseline DNL. Under Noise Mitigation Scenario 5, the DNL increase at each POI would be limited to 3 dBA or less (except for POI S07, Watkins Early Childhood Center).

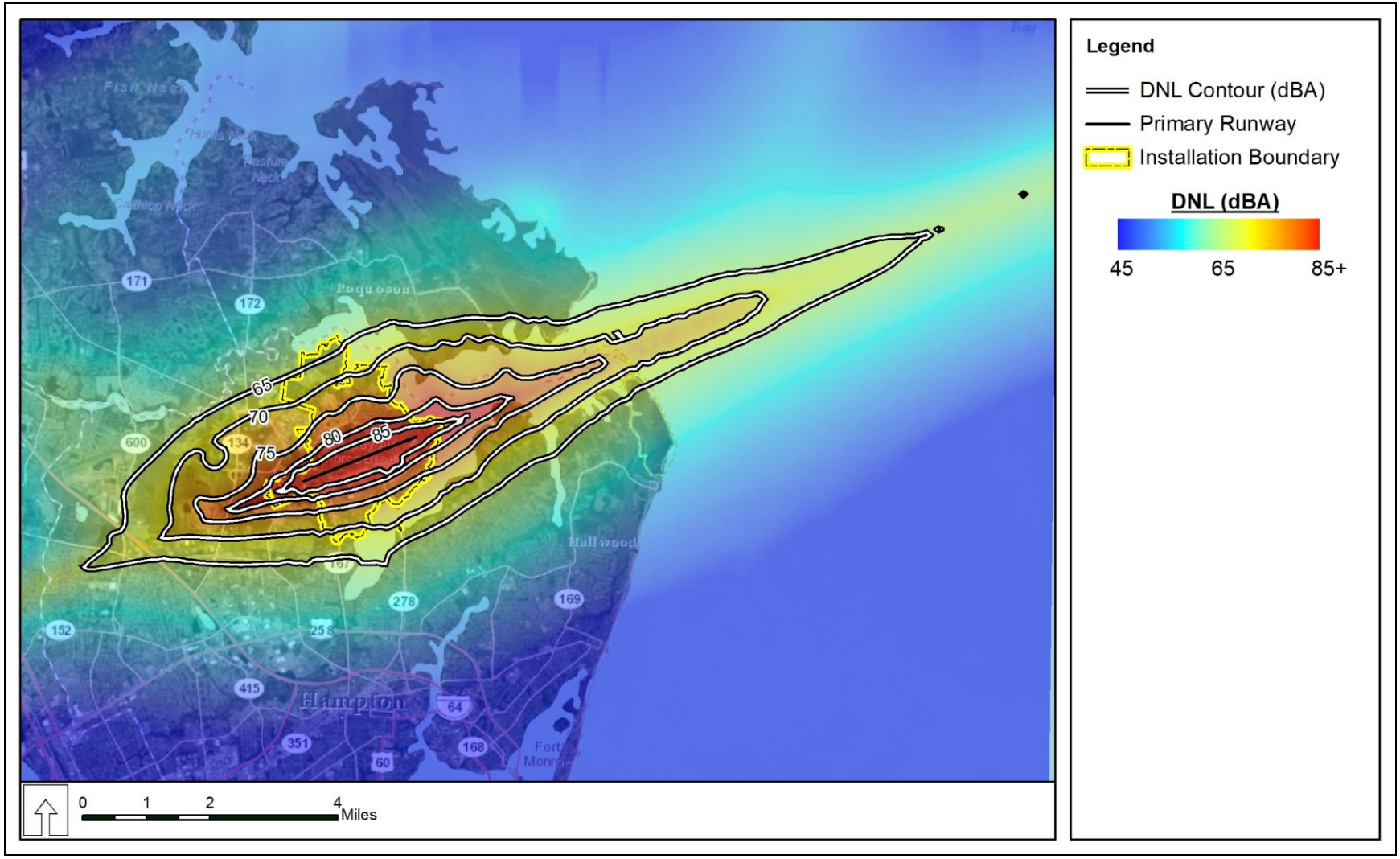


Figure 4-7. Noise Mitigation Scenario 2 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base.

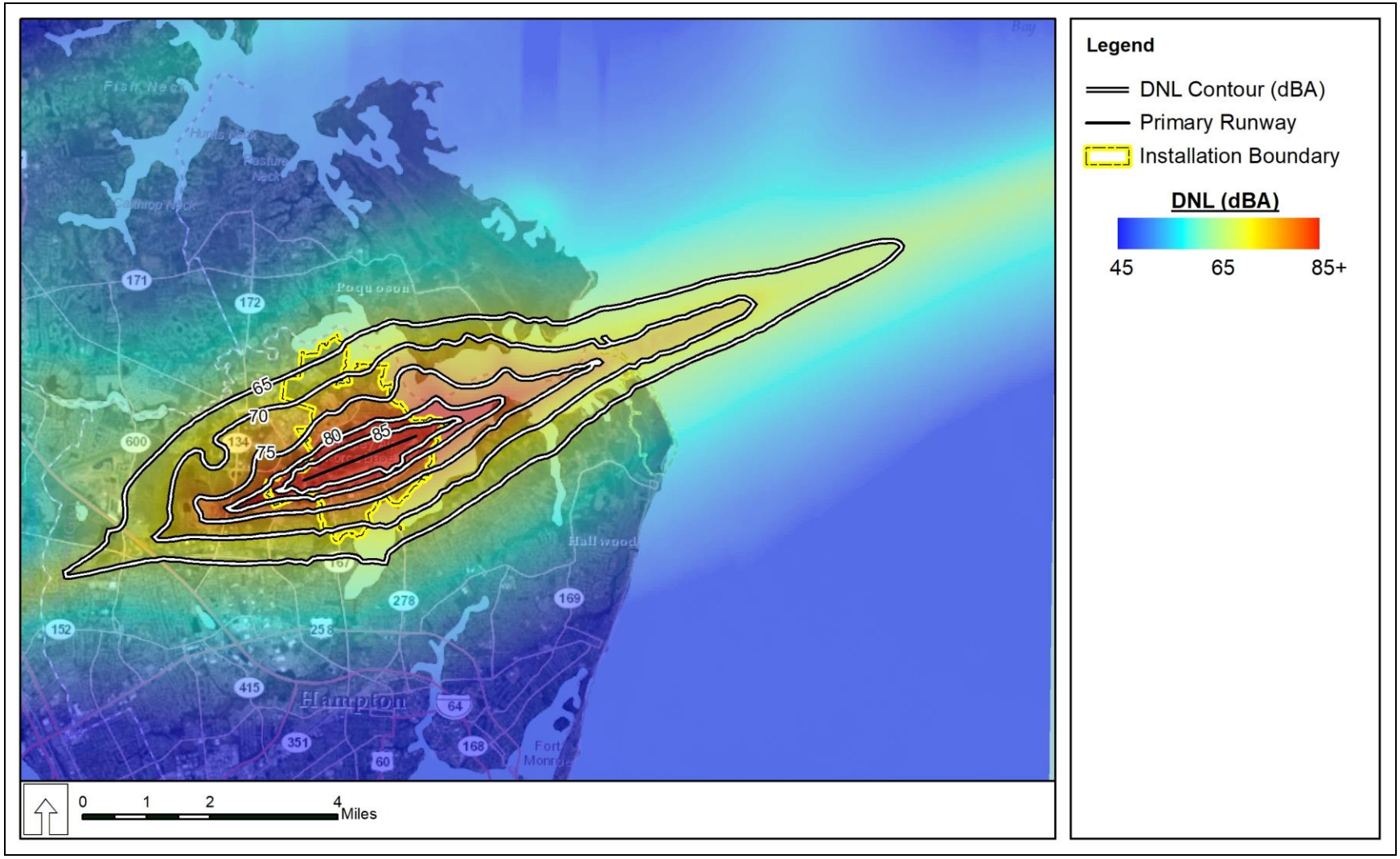


Figure 4-8. Noise Mitigation Scenario 5 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base.

Table 4-15
Noise Mitigation Scenario 5 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

POI		DNL (dBA)		
ID	Description	Existing	Mitigation Scenario 5	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	70	1
H02	Langley Air Force Base Hospital	75	76	1
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	65	2
R01	Residential #1 - Fox Hill	62	64	2
R02	Residential #2 - Poquoson	67	69	2
R03	Residential #3 - Michael's Woods	63	66	3
R04	Residential #4 - Mobile Home Park West Gate	77	78	1
R05	Residential #5 - Mobile Home Park Langley Speedway	74	75	1
R06	Residential #6 - Langley Air Force Base Officer's Housing	76	78	2
R07	Residential #7 - Enlisted Base Housing	77	78	1
S01	Hampton Christian Academy	60	61	1
S02	Machen Elementary School	70	71	1
S03	New Horizons Regional Education Center	67	70	3
S04	Paul Burbank Elementary School	60	62	2
S05	Peninsula Catholic School	53	56	3
S06	Thomas Nelson Community College	67	70	3
S07	Watkins Early Childhood Center	52	56	4
S08	William Mason Cooper Elementary School	59	60	1
W01	Emmanuel Lutheran Church	66	69	3
W02	Faith Baptist Church	61	64	3
W03	Langley Air Force Base Chapel	74	75	1
W04	Sharon Baptist Church	65	66	1

Notes:
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

Selected Approach to Noise Mitigation

Regardless of which alternative is chosen, if the Proposed Action is implemented and the High Noise Scenario contract aircraft are selected for contract ADAIR at JBLE-Langley, the 1 FW and 192 WG will apply Mitigation Scenario 2 or 5 to reduce noise impacts at POIs near JBLE-Langley. Based on the evaluation of the mitigation scenarios that achieve the goal of having an increase in DNL of 3 dBA or less at all POIs, the implementation of either Mitigation Scenario 2 or 5 would be successful with the exception of POI S07, Watkins Early Childhood Center, which would experience a 4-dBA DNL increase under both mitigation scenarios. Although Watkins Early Childhood Center experiences a 4-dBA DNL increase under the Proposed Action and Mitigation Scenarios 2 or 5; this POI would remain below 60-dBA DNL under the Low, Medium, and High Noise Scenarios. As described in **Section 3.2.2**, in accordance with AFH 32-7084, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations. Watkins Early Childhood Center would therefore experience an increase in noise levels, but these would remain below the level that would be considered an incompatible use for a school; therefore, there would be no potentially significant impacts from this greater-than-3-dBA noise increase at this specific POI.

As noted previously, the type of aircraft that would be used by contract ADAIR is unknown at this time. The mitigation would only be implemented if aircraft similar to the High Noise Scenario comprise the contract ADAIR aircraft at JBLE-Langley. If contract ADAIR aircraft are similar to the Medium or Low

Noise Scenario, no mitigation would be required; therefore, the ultimate need for mitigation would be determined by the actual aircraft used for contract ADAIR.

The potential impacts associated with the mitigated Proposed Action are summarized in **Table 2-6** and are described in more detail throughout **Chapter 4**. A mitigation plan is included in **Appendix E**.

4.2.3 *No Action Alternative*

Under the No Action Alternative, contract ADAIR would not perform sorties at JBLE-Langley and nearby airspaces. Under the No Action Alternative, there would be no change to the noise environment.

4.3 SAFETY

4.3.1 *Evaluation Criteria*

Impacts from implementation of the Proposed Action are assessed according to the potential for an increase or decrease in safety risks to personnel, the public, property, or the environment. Adverse impacts on safety might include implementing contractor flight procedures that result in greater safety risk or constructing new buildings within established Q-D safety arcs. For the purposes of this EA, an impact is considered significant if the proposed safety measures are not consistent with AFOSH and OSHA standards resulting in unacceptable safety risks.

Safety concerns associated with ground, explosive, and flight activities are considered in this section. Ground safety considers issues associated with ground operations and maintenance activities that support operations including arresting gear capability, jet blast/maintenance testing, and safety danger zones. Ground safety also considers the safety of personnel and facilities on the ground that may be placed at risk from flight operations in the vicinity of the airfield and in the airspace.

CZs and APZs around the airfield restrict the public's exposure to areas where there is a higher accident potential. Although ground and flight safety are addressed separately, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns. Explosives safety relates to the management and safe use of ordnance and munitions. Flight safety considers aircraft flight risks such as midair collision, BASH, and in-flight emergency requirements. Contractor planes would follow Air Force safety procedures and aircraft specific emergency procedures based on the aircraft design. Basic airmanship procedures also exist for handling any deviations to ATC procedures due to an in-flight emergency; these procedures are defined in AFI 11-202 (Volume 3), AFI 11-2MDS (Volume 3), and established aircraft flight manuals. The Flight Crew Information File is a safety resource for aircrew day-to-day operations which is composed of air and ground operation rules and procedures.

4.3.2 *Proposed Action*

Ground, explosive, and flight safety associated with implementation of the Proposed Action are described in the following sections. Contract ADAIR safety procedures described in this section are mandated by the *Performance Work Statement for the Combat Air Forces (CAF) Contracted Air Support (CAF CAS)* (PWS) (Air Force, 2018).

4.3.2.1 Alternatives 1 and 2

Ground Safety

Under the Proposed Action, limited contractor aircraft maintenance and testing would occur on the aircraft parking ramp or in the hangar and would be consistent with current aircraft maintenance activities on JBLE-Langley. No unique maintenance activities would be associated with the contract ADAIR aircraft. All scheduled depot-level or other heavy maintenance requirements would occur at off base contractor facilities.

Emergency Response

For initial emergency response involving a contract ADAIR aircraft, the Air Force would provide emergency responders (Airport Firefighter) trained on the applicable mission design series they are providing. For crash response, the DOD would provide on-field aircraft CDDAR. For events occurring off-base, civilian authorities (city, county, or state) would be first on scene. After the initial response, the contractor would be required to facilitate crash site security and clean-up. The contractor would be responsible for cooperating with the Air Force or the National Transportation Safety Board investigation, depending upon circumstances of the incident.

The contractor emergency response would include the following:

- Establish a CDDAR program that is fully integrated into the host operating location's CDDAR program. The contractor would provide technical expertise and facilitate the host operating location's response and recovery capability of contractor-owned aircraft, consistent with the following considerations: (1) urgency to open the runway for operational use; (2) prevention of secondary damage to the aircraft; and (3) preservation of evidence for mishap or accident investigations in accordance with AFIs 91-202 and 91-204; National Transportation Safety Board guidelines; and any local operating location guidance, as applicable. The contractor would ensure the host operating location's CDDAR personnel receive familiarization training on contractor aircraft and procedures prior to commencing local flying operations, at permanent and temporary duty operating locations.
- The contractor would develop an egress/cockpit familiarization training program to ensure all host operating location's nonegress personnel (e.g., emergency response personnel, fire department, CDDAR) who may access contractor aircraft cockpits, equipped with egress systems, receive initial and annual refresher training.

Safety Zones

Under the Proposed Action, safety zones around the airfield would not change.

Arresting Gear Capability

Contract ADAIR aircraft would be compatible with the arresting systems on the airfield or able to operate on the airfield without interference to the existing arresting system. There would be no need to change or modify the existing arresting gear. There would be no impacts on arresting gear capability for the implementation of the Proposed Action under Alternative 1 or 2.

No significant impacts on ground safety are anticipated to occur under Alternative 1 or 2 provided the contractor establishes a CDDAR program and all applicable AFOSH and OSHA requirements are implemented.

Explosives Safety

Under the Proposed Action, the Munitions Flight would support contract ADAIR daily training operations with the maintenance and delivery of countermeasure chaff and flares. This support would be provided by trained and certified personnel following Air Force safety guidance and technical orders. Trained and certified contract ADAIR personnel would be responsible for the loading and unloading of defensive countermeasures on contract ADAIR aircraft and would follow approved safety measures outlined in the PWS. Contract ADAIR personnel would also be responsible for the maintenance of captive air training missiles and any ejector cartridges as contractor-provided equipment.

There may be rare occasions in which egress CAD/PAD may need to be removed from the aircraft for maintenance. In accordance with AFMAN 91-201, 11.15, when necessary, units may license a limited quantity of in-use egress explosive components of any Hazard Division explosive in the egress shop after removal from aircraft undergoing maintenance. This limit would not exceed the total number of complete sets for the number of aircraft in maintenance and the net explosive weight is limited. Contract ADAIR

would work with the Wing Safety Office to obtain a license, if needed, to store egress CAD/PAD. Short-term storage could be provided at the Munitions Storage Area provided a courtesy storage agreement is created and space is available. Storage would be limited, short-term, and only in the event of an emergency or unforeseen occurrence such as the issuance of a suspension or restriction egress equipment or munitions. All scheduled maintenance would occur at the contractor's off-base Central Repair Facility. CAD/PAD items are typically replaced just prior to expiration of the service life, which is typically part of aircraft scheduled maintenance. If temporary storage of contract ADAIR CAD/PAD items within the Wing munitions storage area is needed, they would be stored in facilities sited in the Explosive Safety plan for the type and amount of explosives to be stored.

The loading and unloading of countermeasure chaff and flares would occur on the aircraft parking ramp. The proposed ramp area for contract ADAIR aircraft is not currently sited for Hazard Class 1.3 and does not need to be sited for chaff or flares in accordance with AFMAN 91-201 para 12.47.2 and 12.47.3.

No significant impacts on explosive safety are anticipated to occur under Alternative 1 or 2 provided contract ADAIR personnel are trained and all applicable safety guidelines are implemented. Q-D arcs would not change.

Flight Safety

The potential for aircraft accidents is a primary public concern with regard to flight safety. Such accidents may occur as a result of mid-air collisions, collisions with manmade structures or terrain, mechanical failure, weather-related accidents, pilot error, BASH, or strikes from defensive countermeasures used during training. Under the Proposed Action, contract ADAIR would be required to strictly conform to the flight safety rules directed by the Operations Group Commander. In addition, the PWS stipulates the following requirements for contract ADAIR:

- Contractor Flight Operations would respond to and follow ATC vectors from approved facilities per FAA and AFI guidelines.
- Contract ADAIR would be conducted under positive tactical control. Pilots would be responsible to respond to tactical vectors and instructions by the applicable controlling authority (Ground Controller Intercept, Baron Controllers, Range Control Officer, Joint Terminal Attack Controller, etc.). If positive control is unavailable, mission flights would remain autonomous and adhere to the briefed presentations and Special Instructions.
- Contract ADAIR aircraft would
    - be equipped with applicable communication and navigation capability to operate in the National Airspace Structure under FAA Instrument Flight Rules and aircraft operating limitations (if applicable) and International Civil Aviation Organization equipment prerequisites;
    - have at least one type of FAA-approved Navigation System such as a Tactical Air Navigation, Automatic Direction Finder Receiver System, with Automatic Direction Finder indicator; Very High Frequency Omni Directional Range; Global Positioning System/Long Range Navigation;
    - have sufficient precision approach instrumentation (compatible with standard Air Force instrument landing systems) to permit operations down to 300-ft ceilings and 1-statute-mile visibility; and
    - have at least two functional voice radios operating in either the very high frequency/ultra-high frequency bands, and one must be ultra-high frequency.

Bird/Wildlife-Aircraft Strike Hazards

Contractor operations would not follow government BASH procedures; they follow the PWS-directed Flight Operations Procedures and Quality Management System per the references above. In this case, the contractor's BASH plan would be part of the Quality Management System and be integrated with the host Wing's plan. It is expected the contract ADAIR BASH plan would very closely mirror and, in fact, may be an exact copy of the Wing's BASH plan. While it is not required to be so, the contract ADAIR BASH plan would comply with the FAA Wildlife Hazard Mitigation Program.

No significant impacts on airspace/flight safety are anticipated to occur under Alternative 1 or 2 provided that contractor flight safety rules are followed and all applicable AFOSH and OSHA requirements are implemented.

4.3.2.2 Mitigation

No impacts on safety are anticipated to occur under the mitigated Proposed Action provided that contractor flight safety rules are followed and all applicable AFOSH and OSHA requirements are implemented.

4.3.3 *No Action Alternative*

Under the No Action Alternative, contract ADAIR would not perform sorties at JBLE-Langley and nearby airspaces. Under the No Action Alternative, there would be no change to safety.

4.4 AIR QUALITY

4.4.1 *Evaluation Criteria*

The CAA Section 176(c), General Conformity, requires federal agencies to demonstrate that their proposed activities would conform to the applicable SIPs for attainment of the NAAQS. General conformity applies to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area exceed annual *de minimis* thresholds identified in the rule, a formal conformity determination is required of that action. The thresholds are more restrictive as the severity of the nonattainment status of the region increases.

This section discusses the potential effects of the Proposed Action and alternatives on air quality within the ROIs. Because the overland project area (Hampton Roads Area) is currently in an attainment or unclassified for all NAAQS, the general conformity rule does not apply; however, because the Area may be redesignated as an ozone maintenance area with respect to the 1997 standard, the General Conformity Rule was treated as being applicable and thus project emissions were compared against the *de minimis* thresholds. In addition, operations in the Warning Areas would occur outside any AQCR. Warning Areas W-72, W-122, and W-386 extend 3 NM from the coastline (State jurisdictional boundary) out past the 12-NM Territorial Sea boundary and the 24-NM Contiguous Zone boundary. Thus, compliance with the NAAQS would not apply in the Warning Areas and general conformity would not apply.

Although general conformity does not apply in the Warning Areas the applicability criteria of the rule are evaluated against project emissions to further assess potential impacts. To do this, emissions were compared against the *de minimis* thresholds of 100 tpy each. Where the *de minimis* threshold was exceeded, the action was evaluated against the PSD thresholds (250 tpy for criteria pollutants and 100,000 tpy for CO_2e) and against regional emission levels. An earlier version of the General Conformity Rule used a 10 percent indicator for regional significance. Under the rule, “regionally significant action means a Federal action for which the direct and indirect emissions of any pollutant represent 10 percent or more of a nonattainment or maintenance area’s emission inventory for that pollutant”. The regional significance indicator was removed in the March 2010 revision to the rule (40 CFR Parts 51 and 93); however, it still provides one means against which one can evaluate projected contract ADAIR emissions.

The Air Conformity Applicability Model (ACAM) (version 5.0.10 and 5.0.13) was used to provide emissions estimates for contract ADAIR airfield operations, maintenance activities, worker commutes, and flight operations in Warning Areas. ACAM was developed by the Air Force (AFCEC, 2017b); it provides estimated air emissions from proposed federal actions for each specific criterion and precursor pollutant as defined in the NAAQS. Assumptions of the model are discussed in **Appendix C**. ACAM uses the procedures established by the Air Force as provided in *Air Emissions Guide for Air Force Mobile Sources* (AFCEC, 2017a). For aircraft, operational modes, including taxi/idle (in and out), takeoff, climb

out, approach, and pattern flight that includes touch and go operations, are used as the basis of the emission estimates. Furthermore, only emissions in the lower atmosphere's mixing level have a substantial impact on ground-level pollutant concentrations. The mixing layer extends from ground level up to the point at which the vertical mixing of pollutants decreases significantly. The USEPA recommends that a default mixing layer of 3,000 ft be used in aircraft emission calculations (40 CFR § 93.153[c][2]). Based on this aircraft emissions released above 3,000 ft were not included in analysis for the ROIs.

In nonattainment and maintenance areas, emissions at or above 100 tpy are considered significant, particularly as this threshold triggers full conformity analysis. Emissions below 100 tpy are considered moderate or, if very low, minor. The air quality analysis focused on emissions associated with the airfield operations and with sorties in the Warning Areas. As such emissions from ACAM were determined separately for the airfield ROI and the Warning Areas ROI. In addition, emissions associated with the use flares within the Warning Areas were estimated, using draft emission factors found in AP-42.

The analysis using ACAM included in the Draft EA (July 2019) was conducted using default settings resulting in artificially high NO_x for the High Scenario. Revised modeling was performed for the Final EA to include proposed site-specific details. The results of the revised modeling are described in **Section 4.4.2.1** and included in **Appendix C**.

4.4.2 *Proposed Action*

Under the Proposed Action, Alternatives 1 and 2 are identical in terms of potential air emissions. As described in **Chapter 2,** the only substantive difference between the two alternatives is the location of the contract ADAIR facilities on JBLE-Langley (single building or versus two buildings). The number of contract ADAIR sorties, use of associated support equipment, the number of affected personnel, etc. are identical under both alternatives. No construction emissions are associated with either alternative. For these reasons the emissions are calculated for a single alternative in each ROI. Only those emissions associated with the addition of contract ADAIR operations were evaluated as no substantive changes to current operations of the 1 FW and 192 WG are expected to change as a result of the action.

For Alternatives 1 and 2, analyses were performed for three different emission scenarios to evaluate the risk for different adversarial aircraft that may be utilized by the ADAIR contractor. The three different emission scenarios (identified as High, Medium, and Low) are listed below with the engine type used for the basis for the emission calculations.

- High, MiG-29, Engine: F-100-PW-100*
- Medium, Mirage, Engine: F110-GE-100*
- Low, F-5, Engine: J85-GE-21

*Surrogate engine type, reliable criteria emission factors not available for foreign engine types.

4.4.2.1 Alternatives 1 and 2

Joint Base Langley-Eustis, Langley Air Force Base Operations

The emissions were estimated for each year of the Proposed Action beginning in July 2019 and ending in June 2029. **Table 4-16** presents total increases in annual operational emissions under Alternatives 1 and 2 for the ROI in the vicinity of the airfield. The methodologies, emission factors, and assumptions used for the emission estimates for each of the scenarios and related activities are outlined in **Appendix C**.

Although the region is in attainment for the current ozone standard, because of historical nonattainment and maintenance designations for ozone the primary pollutants of concern are NO_x and VOC. **Table 4-16** shows that VOC and NO_x in all three emission standards are below the 100 tpy *de minimis* threshold. Thus, even if the 1997 ozone NAAQS would be reinstated in the Hampton Roads Area in the near future, and the area would revert to an ozone maintenance area, a General Conformity assessment will not be required.

Table 4-16 also shows that CO exceeded 100 tpy (*de minimis* threshold) for the High and Low Emission Scenarios; however, the overall emissions for CO were quite small compared to the regional emissions as shown in **Table 4-17**. CO emissions were below 8 percent of regional stationary source emissions. When mobile source emissions are factored in, the CO emissions were less than 1.6 percent of regional emissions. Given the small regional contribution and the lack of a CO history in the Hampton Roads AQCR/Southeast Virginia Region (never a nonattainment or maintenance area for CO), the higher CO emissions associated with all three emission scenarios are not considered significant. For the remaining pollutants (VOC, SO_x, $PM_{2.5}$, PM_{10}, CO_2e, and NO_x (Low and Medium Scenarios), the annual emission increases are not considered significant under Alternatives 1 and 2 as they are below the 100 tpy *de minimis* threshold.

Table 4-16
Contract Adversary Air Emissions – Airfield Operations

Scenario	Contract Year(s)	Emissions (tpy) [1,2]								
		VOC	NO_x	CO	SOx	PM_{10}	$PM_{2.5}$	CO_2e	Pb	NH_3
High	2019 (July – December)	9.34	32.8	70.4	4.38	5.90	5.39	6,920	0	0.01
	2020 through 2028	18.7	65.6	141	6.27	11.8	10.8	13,840	0	0.02
	2029 (January – June)	9.34	32.8	70.4	4.38	5.90	5.39	6,920	0	0.01
Medium	2019 (July – December)	5.01	21.5	32.5	2.24	3.46	2.29	5,203	0	0.01
	2020 through 2028	10.0	43.0	65.1	4.47	6.93	4.57	10,406	0	0.02
	2029 (January – June)	5.01	21.5	32.5	2.24	3.46	2.29	5,203	0	0.01
Low	2019 (July – December)	25.0	12.0	124	1.68	1.08	1.05	3,406	0	0.01
	2020 through 2028	50.0	24.0	247	3.36	2.17	2.10	6,811	0	0.02
	2029 (January – June)	25.0	12.0	124	1.68	1.08	1.05	3,406	0	0.01

Source: Air Conformity Applicability Model output

Notes:
[1] Represents total per year emissions for: 1) flight operations (includes trim tests and auxiliary power unit use), 2) Aerospace Ground Equipment, 3) aircraft maintenance (parts cleaning), and 4) JET-A storage (fuel for contract ADAIR operation only).
[2] Based on 4,100 landing and takeoff and 554 touch and go cycles per year.

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NH_3 = ammonia; NO_x = nitrogen oxides; Pb = lead; $PM_{2.5}$ = particulate matter less than 2.5 microns; PM_{10} = particulate matter less than 10 microns; SO_x = sulfur oxides; tpy = ton(s) per year; VOC = volatile organic compound

Table 4-17
Projected Contract Adversary Air Emissions – Percent of Regional Emissions

Inventory Type	Carbon Dioxide			Nitrogen Oxides
	High	Medium	Low	High
Stationary Inventory (Permitted Sources)[1]	4.24	1.96	7.46	1.22
Stationary Inventory + Mobile Estimate[2]	0.87	0.40	1.53	0.41

Notes:

[1] Virginia 2016 Annual Point Source Criteria Pollutant Emission Inventory Data (VDEQ, 2016).
[2] Estimated based on 2014 National Inventory Data (USEPA, 2014). CO percentage based on an estimate that mobile emissions are 3.5 times stationary source emissions and for NO_x mobile source emissions are two times stationary source emissions. Analysis does not account for emissions from sources that do not have operating permits. Inclusion of such emissions would lower percentages further.

Airspace Operations

The emissions associated with contract ADAIR sorties proposed for Warning Areas W-386, W-122 and W-72 were evaluated using ACAM for the High, Medium and Low Scenarios described previously. Consistent with the USEPA recommendation regarding mixing height only those emissions that would occur with the mixing layer (lowest 3,000 ft) were analyzed. Out of the of the annual sorties proposed, 3,075 are expected to include have some portion of training flights between 500 ft to 3,000 ft above sea level in W-386. In W-122 and W-72, 205 sorties are expected to occur in the same altitude range. The flight time in the mixing layer for all three Warning Areas is estimated to be 11.4 minutes per sortie.

All sorties are expected to use chaff and flares. Chaff and flares can be dispensed in the offshore Warning Areas without altitude restrictions (Air Force, 2001). The Air Quality impacts of chaff were studied by the Air Force and reported in *Environmental Effects of Self-Protection Chaff and Flares* (Air Force, 1997). That study determined that chaff material maintains its integrity after ejection and that the use of explosive charge in impulse cartridges results in minimal PM_{10}. As a result, it was concluded that the deployment of chaff would not contribute to an exceedance of the NAAQS. Chaff deployment was therefore not included in the air quality assessment. Emission from M206 Countermeasure Flares were estimated using Emission Factors for AP-42 Section 15.8 (USEPA, 2009). Only flares deployed at or below 3,000 ft were included in the analysis. The quantity deployed (total estimated future use minus *current* baseline use) was proportioned based on the percent of total time spent in the 500 to 3,000 ft altitude range per sortie.

Table 4-18 shows the emissions estimated for the Warning Areas that are the result of contract ADAIR sorties and the deployment of countermeasure flares. Emissions estimates cover the proposed 10-year period beginning in July 2019 and ending in June 2029. Overall the use of flares made a negligible contribution to the emissions for the High, Medium, and Low Scenarios. Maximum emission rates associated with the use of flares were for PM_{10} at 16.6 pounds per year (0.008 tpy) and CO_2 at 29.6 pounds per year (0.014 tpy).

The offshore Warning Areas are not in a regulatory control area and are beyond state jurisdictional boundaries. As such the general conformity rule would not apply; however, the 100 tpy *de minimis* threshold for the General Conformity Rule was applied as significance indicator. Only NO_x (122 tpy) for the High Scenario exceeded the 100-tpy threshold. This is well below the 250 tpy threshold for PSD applicability in an attainment area and it is a relatively small concentration considering the large size of W-386 (12,786 sq mi). Since the emissions are dispersed over a wide area, they are not expected to have a significant impact on air quality within the Warning Areas. The remaining criteria pollutants are below 100tpy, and CO_2e is below 100,000 tpy. As such these pollutants are not expected to impact air quality in any of the Warning Areas.

4.4.2.2 Mitigation

No air quality mitigation would be required. Noise mitigation measures such as changes in flight tracks and runway use would have little to no impact on current aircraft flight operations emission estimates as they would not substantially increase the time spent within the mixing layer (below 3,000 ft) or result in long period changes in power mode. Emission estimates for each scenario (High, Medium, and Low) are already independent of the type of engine type used for the three noise scenarios (worst care engine/aircraft surrogate for air quality impacts are not necessarily the same as worst case engine/surrogate for noise impacts) thus any changes in aircraft type to reduce noise impacts would not change air quality impacts (potential worst-case impacts are already considered).

4.4.3 *No Action Alternative*

The No Action Alternative would not generate any new emissions and would not change emissions from current baseline levels presented in **Section 3.4**. As a result, no impacts would occur to regional air quality under the No Action Alternative.

The methodologies, emission factors, and assumptions used for the emission estimates for each of the scenarios and related activities are outlined in **Appendix C**.

Table 4-18
Contract Adversary Air Emissions – Airspace

Airspace	Scenario	Contract Years	Emissions (tpy)[1]								
			VOC	NO_x	CO	SOx	PM_{10}	$PM_{2.5}$	CO_2e	Pb	NH_3
Warning Area W-386[2]	High	2019 (July - December)	0.32	60.8	1.62	2.38	1.62	1.46	7,260	0	0
		2020 through 2028	0.64	122	3.23	4.76	3.23	2.91	14,521	0	0
		2029 (January - June)	0.32	60.8	1.62	2.38	1.62	1.46	7,260	0	0
	Med	2019 (July - December)	0.05	18.1	3.72	1.14	0.62	0.44	3463	0	0
		2020 through 2028	0.10	36.2	7.4	2.27	1.23	0.88	6927	0	0
		2029 (January - June)	0.32	60.8	1.62	2.38	1.62	1.46	7260	0	0
	Low	2019 (July - Dec)	2.61	1.49	27.9	0.69	0.01	0.01	2,099	0	0
		2020 through 2028	5.23	2.99	55.8	1.38	0.01	0.01	4,198	0	0
		2029 (January - June)	2.61	1.49	27.9	0.69	0.01	0.01	2,099	0	0
Warning Areas W-122 and W-72[3]	High	2019 (July - December)	0.02	4.05	0.11	0.16	0.11	0.10	484	0	0
		2020 through 2028	0.04	8.11	0.22	0.32	0.22	0.19	968	0	0
		2029 (January - June)	0.02	4.05	0.11	0.16	0.11	0.10	484	0	0
	Med	2019 (July - December)	0.003	1.21	0.25	0.08	0.04	0.03	231	0	0
		2020 through 2028	0.01	2.42	0.50	0.15	0.09	0.07	462	0	0
		2029 (January - June)	0.003	1.21	0.25	0.08	0.04	0.03	231	0	0
	Low	2019 (July - December)	0.17	0.10	1.86	0.05	0.004	0.004	140	0	0
		2020 through 2028	0.35	0.20	3.72	0.09	0.01	0.008	280	0	0
		2029 (January - June)	0.17	0.10	1.86	0.05	0.004	0.004	140	0	0

Source: Air Conformity Applicability Model output

Notes:
[1] Represents total per year emissions.
[2] 3,075 sorties (75 percent of total sorties)
[3] 205 sorties (5 percent of total sorties)

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NH_3 = ammonia; NO_x = nitrogen oxides; Pb = lead; $PM_{2.5}$ = particulate matter less than 2.5 microns; PM_{10} = particulate matter less than 10 microns; SO_x = sulfur oxides; tpy = ton(s) per year; VOC = volatile organic compound

4.4.4 *Climate Change Considerations*

The coastal regions of the Middle Atlantic States and in particular the Chesapeake Bay are very vulnerable to the effects of climate change. Thermal expansion caused by warming oceans and the melting of glaciers and ice caps appear responsible for an observed sea level rise in the Chesapeake Bay of about 1 ft. A further rise of more than 1 ft (up to 5.2 ft) is predicted over the next 100 years. This damages fragile ecosystems and contributes to the loss of wetlands. Warmer bay water themselves lead to unnatural changes in aquatic habitats that negatively impact marine life and fauna (CBF, 2018).

Annual GHG emissions from the Proposed Action are relatively low. Although Title V and PSD are not applicable to this action the applicability thresholds for these permitting requirements were compared against projected CO_2e emission levels as an indicator of significance. In addition, projected CO_2e emissions were compared against State and regional (mid-Atlantic) GHG emission estimates and projections to further assess the significance of contract ADAIR generated GHG emissions. **Table 4-19** shows this analysis. CO_2e emissions for all three scenarios fall well below the permitting thresholds and account for less than 0.03 percent of State CO_2e emissions. This demonstrates that in isolation additional CO_2e emissions expected as a result of contract ADAIR would have a negligible impact. The relative quantity of GHG emissions from the Proposed Action is expected to be so low that it would be cost-prohibitive to consider mitigation measures.

Table 4-19
Indicators for Carbon Dioxide Emission Impacts

Emission Scenario	ADAIR Projected CO_2e Emissions (tpy)[1]	CO_2 Permit Applicability Thresholds (tpy)		Inventory Data (MMt CO_2e/yr)		
		Title V	PSD New / Modified Source	2015 Virginia Energy Sector[2]	Regional 2015 Energy Sector[2, 3]	Projected 2020 VA Emissions: All Sectors[4]
High	29,329	100,000	100,000 / 75,000	103	295.4	200.1
Medium	17,795					
Low	11,290					

Notes:

[1] Sum of emissions from airfield operations and Warning Area sorties.
[2] Source: U.S. Energy Information Administration, *Energy - Related Carbon Dioxide Emissions by State, 2000-2015* (USEIA, 2018).
[3] Combined emissions for the States of Virginia, Maryland, Delaware and North Carolina
[4] Source: Center for Climate Strategies, *Preparation of Virginia Greenhouse Gas Reference Case Inventory and Forecast* (CCS, 2006).

CO_2e = carbon dioxide equivalent from ACAM; MMt = million tons per year (to convert from MMt to tpy multiply by 1.1E6); tpy = tons(s) per year

4.5 BIOLOGICAL RESOURCES

4.5.1 *Evaluation Criteria*

The level of impact on biological resources is based on the

- importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;
- proportion of the resource that would be affected relative to its occurrence in the region;
- sensitivity of the resource to the proposed activities; and
- duration of potential ecological ramifications.

The impacts on biological resources are adverse if species or habitats of high concern (i.e., federally and state listed threatened and endangered species, marine mammals, designated critical habitat, and Essential Fish Habitat) are negatively affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid unauthorized “take” of federally threatened or endangered species or adverse modification of designated critical habitat. The ESA section 7 consultation process would result in either a concurrence on the Air Force’s determination of “effect, but no adverse effect” on listed species, or a biological opinion with either an Incidental Take Statement that authorizes a specified amount of “take” (or adverse modification of designated critical habitat) or a jeopardy determination.

4.5.2 *Proposed Action*

Under the Proposed Action, there would be no ground-disturbing activities and all potential impacts on biological resources would be associated with aircraft operations at JBLE-Langley and in Warning Areas W-386, W-122, and W-72. The aircraft operations associated with the Proposed Action could have impacts on biological resources from aircraft movement, the use of defensive countermeasures, noise, or BASH. Because the number and type of aircraft as well as flight profiles and airspace are the same under all alternatives, potential impacts on biological resources are the same for all action alternatives.

Chaff and flares (types similar to RR-188 chaff and M206 flares) are proposed for annual use during the training sortie operations. Potential direct impacts on resources from training activities include the deposition of residual materials, such as plastic, from chaff and flare use, its accumulation in sensitive areas, and the ultimate breakdown of these materials into substrate mediums. Indirect impacts include transportation of these materials to other areas by environmental elements and the potential for ingestion by sensitive species within the Warning Areas. Depending on the altitude of release and wind speed and direction, the chaff from a single bundle can be spread over distances ranging from less than a 0.25 mi to over 100 mi (Air Force, 1997). The most confined distribution would be from a low-altitude release in calm conditions (Air Force, 1997).

Chaff chemical composition, rate of decomposition, and tendency to leach toxic chemicals under various situations paired with baseline substrate chemistry and conditions are factors that could potentially alter substrate chemistry. Silica (silicon dioxide), aluminum, and stearic acid are major components of chaff with minor quantities of copper, manganese, titanium, vanadium, and zinc in the aluminum chaff coating. All are generally prevalent in the environment, and all but titanium are either found in plants and animals and/or necessary essentials for their growth. Silica does not present a concern to chemistry as it is found in silicate minerals, the most common mineral group on Earth. Silica is more stable in acidic environments than alkaline; however, ocean waters are slightly more alkaline than neutral (USEPA, 2019). Aluminum is also very abundant in the earth's crust, forming common minerals like feldspars, micas, and clays. While acidic and extremely alkaline substrates increase the solubility of aluminum, what is left eventually oxidizes to aluminum oxide which is insoluble. Stearic acid is used in conjunction with palmitic acid to produce an anticlumping compound for chaff fibers and both degrade when exposed to light and air (Air Force, 1997).

The primary material in flares is magnesium, which is not highly toxic, and it is highly unlikely organisms would ingest flare materials; however, plastic caps are released with the deployment of both chaff and flares. Some flares utilize impulse cartridges and initiates which contain chromium and sometimes lead. Even though these are hazardous air pollutants under the CAA and have been known to cause health risk in certain avian species, significant effects on biological resources are not expected because previous studies have indicated that there are no health risks from flare components (Air Force, 1997), the amount of lead is expected to be very small and dispersed over great distances, and the use of BMPs would avoid the selection of flares containing lead. More significantly, flares have a potential to start fires that can spread, adversely and indirectly affecting many resources; however, all use of flares are over the Atlantic Ocean in the Warning Areas where there would be no risk of fires from the use of flares.

The following BMPs would be implemented as appropriate:

- Comply with Air Force and local procedures.
- Replace impulse cartridges and initiators in future procurements of flares with models that do not contain toxic air pollutants such as chromium and lead.

4.5.2.1 Alternatives 1 and 2

Vegetation

Under the Proposed Action, there would be no ground-disturbing activities and as such no potential to disturb vegetation or habitats on JBLE-Langley; therefore, there would be no impacts on vegetation under Alternative 1 or 2.

The Proposed Action within the Warning Areas would not have impacts on vegetation communities or habitats under Alternative 1 or 2 as all contract ADAIR sorties would occur over the Atlantic Ocean.

Wildlife

There is limited suitable habitat for wildlife on developed areas of JBLE-Langley and adjacent to the base; however, undeveloped areas along the Chesapeake Bay support relatively common wildlife species associated with estuarine and nearshore environments. Wildlife, and especially avian species, utilizing these bayshore areas for foraging and breeding would normally be sensitive to increased noise impacts from military aircraft. Although there is variability in responses across species, many birds and wildlife have the ability to habituate to noise and movement from military aircraft (Grubb et al., 2010) and military aircraft operations have been ongoing at JBLE-Langley for decades. As such, the noise and movement from increased aircraft operations is anticipated to have negligible short-term and long-term impacts on wildlife, including birds breeding and foraging in nearby relatively undisturbed habitats, under Alternative 1 or 2.

Aircraft operations always have the potential for bird and other wildlife strikes. This can occur during takeoff and landing on and near active runways, as well as during flight at altitude. With an increase in air operations associated with contract ADAIR aircraft at JBLE-Langley, there is an increased risk of BASH; however, JBLE-Langley maintains a BASH prevention program specifically to manage BASH risk and implement measures to greatly reduce the likelihood for BASH incidents. The outcome of the BASH program is both increased safety for pilots and military aircraft as well as less incidents of injury or death to birds and other wildlife. As such, with the continued airfield management and risk reduction implementation measures associated with the BASH program, the impacts on birds and other wildlife from contract ADAIR aircraft strikes during air operations at JBLE-Langley is minor as discussed in **Section 4.3.2.1**.

Although contract ADAIR aircraft training can operate as low as the sea level surface, the majority of contract ADAIR aircraft training operations in the Warning Areas would occur at altitudes above where most bird species would be migrating or foraging. As such, it is highly unlikely that aircraft movement would adversely impact foraging or migrating birds or have a risk of BASH under Alternative 1 or 2. Migrating birds could have a greater potential of encountering contract ADAIR aircraft during training operations, especially those that migrate at altitudes above 2,000 ft; however, given the large area where training would occur, that most contract ADAIR training would occur during daytime hours while most songbirds migrate at night, and that most migratory birds migrate at altitudes less than 2,000 ft, the likelihood for birds to encounter aircraft during training operations is low; therefore, adverse impacts on birds from aircraft movement is negligible under Alternative 1 or 2. Further, given the altitudes that the majority of training occurs, aircraft movement in the Warning Areas would have no impacts on marine mammals under Alternative 1 or 2.

Noise modeling for the contract ADAIR aircraft training operations (see **Section 4.2.2**) indicates that there would be no substantial increase in noise impacts within the Warning Areas, and that subsonic and/or supersonic noise levels in the airspace would be less than the 45-dBA DNL. Contract ADAIR training would make up less than 1 percent of the total aircraft training activities that occur in the Warning Areas[3]. The negligible change in noise levels as a result of contract ADAIR training would have no impact on foraging or migrating birds, marine mammals, or sea turtles in the Warning Areas under Alternative 1 or 2.

Sonic booms from supersonic flights within the Warning Areas could cause startle effects on avian and mammal species at or near sea level; however, the sonic boom and post-boom rumbling sounds that would be experienced by wildlife do not differ substantially from thunder. Further, the sonic boom events would be highly isolated and rare occurrences in the Warning Areas and occur in areas where supersonic

[3] William Reabe, Air Warfare Division (OPNAV N98), Naval Airspace and ATC Standards and Evaluation Agency, JBLE, Virginia, e-mail to John Saghera, ACC/A3TO, 27 January 2018.

flights currently occur with military training activities. Numerous studies indicate that most wildlife do not react substantially to sonic booms (US Air Force, 2006), and no breeding or nesting activities for terrestrial species would occur in the Warning Areas. As such, sonic booms from supersonic flights would have no impact on wildlife, including marine mammals and sea turtles in the Warning Areas under Alternative 1 or 2.

Under the Proposed Action, the use of chaff and flares would increase by 13 percent within the Warning Areas. Impacts on avian species from the use of chaff and flares would be limited to a startle effect from chaff and flare deployment and inhalation of chaff fibers or flare combustion products. The potential of being struck by debris, given the small increase in chaff and flare use in such a large area over the Atlantic Ocean, or a dud flare is remote. Startle effects from the release of chaff and flares would be minimal relative to the noise of the aircraft. The potential for avian species, marine mammals, or sea turtles to be startled from flare deployment at night when flares would be most visible would be minimal due to the short burn time of the flare and the very small number of night training flights that are proposed. It is highly unlikely that during active military training with contract ADAIR aircraft that birds would remain in the area where training is occurring to be adversely impacted by chaff and flares deployment. Further, chaff and flares are so small in size, that it is highly unlikely that the small amount of lightweight material ejected during their deployment would have an adverse impact on birds or that the material would reach the ocean surface. Lastly, an evaluation of the potential for chaff to be inhaled by humans and large wildlife found that the fibers are too large to be inhaled into the lungs and that chaff material is made of silicon and aluminum that has been shown to have low toxicity (Air Force, 1997); therefore, the use of chaff and flares during contract ADAIR training would have a negligible impact on birds under Alternative 1 or 2.

Small residual plastic components of chaff and flares such as end caps and pistons however would be deposited on the ocean surface during training activities. Some large foraging bird species as well as marine mammals and sea turtles could ingest the remaining plastic components of chaff and flares if these components remain on the ocean surface or in the water column. The effect of chaff and flare components on federally listed bird species, marine mammals, and sea turtles is discussed under the threatened and endangered species section below.

Fish

Increased aircraft operations in the Warning Areas would have no impact on marine fish. The increased use of chaff and flares does increase the potential for plastics associated with chaff and flares to end up in aquatic ecosystems and in the ocean; however, the amount of plastic material expended in the use of chaff and flares is small, the size of the plastic material is also very small, and most of the material would fall to the ocean floor at depths below which most fish species occur; however, the use of chaff and flares under Alternative 1 or 2 may have a minor adverse impact on fish species that are large enough to ingest plastic pieces that fall to the ocean floor on the small portion of the continental shelf that overlaps the boundaries of the Warning Areas, even though the likelihood of any large fish species encountering plastic caps from chaff and flares is extremely low. The additional contract ADAIR sorties in the special use airspace, including the use of defensive countermeasures, would have no impact on Essential Fish Habitat.

Invasive Species

There are no activities associated with the Proposed Action that have the potential to affect invasive species. There would be no ground-disturbing activities that have the potential to spread or remove invasive plants. Similarly, aircraft operations on the airfield or in the Warning Areas would have no impact on invasive plants or wildlife under Alternative 1 or 2.

Threatened and Endangered Species

Under the Proposed Action, there would be no ground-disturbing activities, and all potential impacts on biological resources would be associated with aircraft operations in the project area. Because there would

be no ground-disturbing activities, there would be no impacts on federally or state listed plant species, reptiles, amphibians, fish, or invertebrates.

Effects on other listed species could occur from flight operations associated with contract ADAIR training. These aircraft operations could affect biological resources from aircraft movement, noise, bird and animal aircraft strikes, and use of defensive countermeasures. For listed bird species, given the large area and high altitude where the majority of contract ADAIR training would occur, and that most ADAIR training would occur during daytime hours, the likelihood for birds to encounter aircraft during training operations is low. Because contract ADAIR would fly only up to a projected 3 percent of the estimated 4,000 annual sorties in the special use airspace during environmental night hours and approximately 81 percent of the training flight times would be at higher altitudes, these night flights would not adversely affect migrating birds including listed bird species. There would be no effect on any of the listed avian species from the proposed contract ADAIR aircraft operations at JBLE-Langley. None of these avian species are known to occur proximate to JBLE-Langley and there is no suitable habitat for these listed avian species near the airfield or near low altitude approach patterns.

Further, it is highly unlikely that either aircraft movement or noise emissions, especially at higher altitudes, would elicit a response from marine mammals or sea turtles. Noise from contract ADAIR aircraft would not increase substantially (including from sonic booms) in the Warning Areas and would therefore have no effect on the listed marine mammal species and sea turtles. Sonic booms from supersonic aircraft movement could cause a startle response by the listed species when they are present on the surface of the ocean; however, sonic booms would be relatively rare events during contract ADAIR training in the action area, and the sonic boom and post-boom rumbling would be similar to what mammal species and sea turtles experience during a thunderstorm. Sonic booms from supersonic aircraft movement would therefore have no effect on listed species.

There is the potential for components of chaff and flares that remain after use to make their way to the surface of the Atlantic Ocean where they could be ingested by birds, marine mammals, sea turtles, and fish. Chaff cartridges, chaff canisters, chaff components, and chaff and flare end caps and pistons would be released into the marine environment, where they would persist for long periods and could be ingested by marine wildlife while initially floating on the surface and sinking through the water column. Chaff and flare end caps and pistons would eventually sink to the seafloor (Spargo, 2007), which would reduce the likelihood of ingestion by marine wildlife at the surface or in the water column.

Bird species could potentially encounter chaff and flare components on the ocean surface while foraging. Some species of seabirds are known to ingest plastic when it is mistaken for prey (Auman et al., 1997; Yamashita et al., 2011; Provencher et al., 2014). The ingestion of plastic such as chaff and flare compression pads or pistons by birds could cause gastrointestinal obstructions or hormonal changes leading to reproductive issues (Provencher et al., 2014). Unless consumed plastic pieces were regurgitated, the chaff and flare compression pads or pistons could cause digestive tract blockages and eventual starvation and be lethal to birds foraging on the ocean surface such as the Bermuda petrel and roseate tern; however, based on the available information, it is not possible to accurately estimate actual ingestion rates or responses of individual bird species (Moser and Lee, 1992); for example, it is possible that these bird species do not mistake these plastic components for prey and mistakenly consume them. Regardless, the majority of these chaff and flare plastic components would fall through the water column to the sea floor (Spargo, 2007) and would not remain on the surface of the Atlantic Ocean where a foraging bird would encounter and consume the plastic pieces. Further, given the small number of chaff and flares that would be used over the large expanses of the Atlantic Ocean in the Warning Areas, it is highly unlikely that birds such as the Bermuda petrel and roseate tern would ever encounter chaff and flare components while they were floating on the ocean surface; therefore, the use of chaff and flares over the Atlantic Ocean as a result of the contract ADAIR training, with the potential for the ingestion of plastic chaff and flare components, may affect but is not likely to adversely affect the Bermuda petrel and roseate tern.

In the very unlikely event that unconsumed chaff and flare components were encountered and ingested by a marine mammal, the small size of chaff and flare end-caps and pistons (i.e., 1.3-inch diameter and

0.13 inches thick) would pass through the digestive tract of marine mammals; therefore, the use of defensive countermeasures may affect but is not likely to adversely affect marine mammals. Sea turtles could also ingest the end caps of chaff and flares. It is likely that small residual plastic components of chaff and flares would also pass through the digestive tract of mature sea turtles. Small plastic components could however cause digestive problems for sea turtles if ingested, but with the large area that would be utilized for contract ADAIR training in the Warning Areas and a proposed 13 percent annual increase in the use of chaff and flares in the Warning Areas from the proposed contract ADAIR training activities, it is highly unlikely that a sea turtle would encounter chaff and flare components; therefore, the use of chaff and flares over the Atlantic Ocean as a result of contract ADAIR training may affect but is not likely to adversely affect sea turtles.

Given the range of Atlantic sturgeon and the likelihood that the species' occurrence would be more prevalent in shallow marine waters, and most of the contract ADAIR training activities would be over deeper marine waters under the Warning Areas, the chance of Atlantic sturgeon encountering chaff and flare pistons and caps on the ocean floor while foraging would be highly unlikely. Even if the small chaff and flare plastic components were encountered by Atlantic sturgeon, it is not known if they would be mistaken for prey and consumed; therefore, the use of defensive countermeasures during contract ADAIR training may affect but is not likely to adversely affect the Atlantic sturgeon. The range of adult shortnose sturgeons in the Atlantic Ocean is very limited, and the species does not move into the Warning Areas. Given the limited range of the shortnose sturgeon in the Atlantic Ocean, the short periods of time that the species spends in saltwater environments, and the distance of the Warning Areas from coastal waters where the shortnose sturgeon would be more likely found, the shortnose sturgeon would not be present in the Warning Areas; therefore, the shortnose sturgeon would not encounter plastic debris from chaff and flares in the Warning Areas, and the proposed project would have no effect on the shortnose sturgeon.

As previously mentioned, ADAIR training would have no effect on federally or state listed reptiles (with the exception of marine turtles), amphibians, invertebrates, and mollusks (see **Table 3-8**) as all ADAIR training activities in the action area would be limited to aircraft movement and the use of defensive countermeasures in the Warning Areas.

Section 7 consultation with the USFWS and NMFS has been completed. Concurrence with a not likely to adversely affect federally listed species under NMFS jurisdiction as well as a Section 7 concurrence self-certification letter from the USFWS Virginia Field Office have been received (**Appendix A**).

Wetlands

The locations proposed for use on the installation are not located near wetlands. There would be no need to fill or alter wetlands on JBLE-Langley; therefore, there are no impacts associated with wetlands on the installation under Alternative 1 or 2.

4.5.2.2 Mitigation

The proposed mitigation to reduce noise under the High Noise Scenario would have minor, long-term, beneficial impacts on wildlife at and near JBLE-Langley. The proposed mitigation would reduce the land area within noise contours greater than the 65-dBA DNL; this would reduce potential noise-induced stress to wildlife, especially avian and mammal species that breed and forage in the vicinity of JBLE-Langley.

4.5.3 *No Action Alternative*

Under the No Action Alternative, the contract ADAIR operations would not occur at JBLE-Langley, and there would be no training operations in the Warning Areas. As such, there would be no change to biological resources.

4.6 LAND USE

4.6.1 *Evaluation Criteria*

Potential impacts on land use are based on the level of land use sensitivity in areas potentially affected by the Proposed Action and alternatives as well as compatibility of those actions with existing conditions. In general, a land use impact would be adverse if it met one of the following criteria:

- inconsistency or noncompliance with existing land use plans or policies;
- precluded the viability of existing land use;
- precluded continued use or occupation of an area;
- incompatibility with adjacent land use to the extent that public health or safety is threatened; and
- conflict with planning criteria established to ensure the safety and protection of human life and property.

4.6.2 *Proposed Action*

Under the Proposed Action, contract ADAIR would augment current ADAIR sorties flown by the 1 FW and 192 WG at JBLE-Langley. Contract ADAIR personnel would use existing facilities at JBLE-Langley for operations, maintenance, and administrative activities, as well as for equipment and tool storage. In addition, an existing ramp would be used for parking aircraft. Contract ADAIR proposes to use existing airspace (W-386, W-72, and W-122). The Proposed Action is compatible with the IDP (formerly the General Plan) for JBLE (JBLE, 2013). The Proposed Action also would use existing facilities that are available for use at JBLE-Langley. Two options for operations and maintenance facilities are proposed; all facilities would require some internal modifications. Under both options, aircraft would be parked on the East Ramp, which is located in an Aircraft Operations and Maintenance land use area. Airspace would be over water; land use under the airspace would not be impacted by the Proposed Action.

Implementation of alternatives differs only in the facilities chosen for operations, maintenance, and aircrew briefings. Because the number and type of aircraft, using the same flight profiles and airspace are the same under all alternatives, potential impacts associated with land use are the same for all alternatives.

4.6.2.1 Alternatives 1 and 2

Under Alternatives 1 and 2, there would be no impact on land use on JBLE-Langley. All buildings proposed for use are located on land designated as Aircraft Operations and Maintenance; as such, there would be no long-term changes to the existing land use.

As outlined in **Section 3.2.2**, a number of POIs have been identified in the vicinity of JBLE-Langley made up of noise-sensitive receptors such as homes, schools, hospitals, and places of worship. Noise increases of a greater-than-3-dBA DNL near sensitive receptors can alter the noise setting, resulting in potential incompatibility with the surrounding land uses. As indicated in **Section 4.2**, if the High Noise Scenario was to be implemented, the DNL would increase 1 to 8 dBA. The greater affected area (see **Figure 4-2**) would result in noticeable effects on noise-sensitive POIs. This change in the noise setting would be potentially significant, long-term, and incompatible with many surrounding land uses under both Alternatives 1 and 2.

A comparison of the DNL noise contours of the Low, Medium, and High Noise Scenarios and the existing conditions is included in **Section 4.2**. **Table 4-20** includes a summary of the increase in area (land and water) potentially affected on and surrounding JBLE-Langley as a result of the Low, Medium, and High Noise Scenarios. As illustrated in **Table 4-10**, the area (land and water) potentially affected by increased noise levels from the Proposed Action would increase. Under the High Noise Scenario, 6,415 ac (over half of which is land) would be newly exposed to noise levels above the 65-dBA DNL, which is considered to be a level where noise becomes an annoyance to routine activities (see **Appendix B**). These locations, however, have historically been exposed to elevated noise levels from military operations in the region.

JBLE-Langley and the surrounding communities would continue to collaborate on land use issues and develop and update land use plans as needed.

Since there is no construction as part of the Proposed Action, interference with the Virginia's Coastal Zone Management program for protection of coastal communities and resources would not occur. As such, no impacts on coastal zones are expected.

Table 4-20
Increase in Day-Night Average Sound Level Area Potentially Affected on and Surrounding Joint Base Langley-Eustis, Langley Air Force Base

Noise Level (dBA DNL)	Area Within Noise Contour (acres)		
	Low Noise Scenario Increase	Medium Noise Scenario Increase	High Noise Scenario Increase
>65	915	1,097	6,415
>70	466	469	2,709
>75	238	216	1,056
>80	100	92	436
>85	44	34	143

4.6.2.2 Mitigation

Implementation of noise mitigation measures, if the High Noise Scenario aircraft were selected, would reduce the number of POIs potentially impacted by a greater-than-3-dBA DNL increase at JBLE-Langley and environs. Under the recommended mitigation options discussed in **Section 4.2.2.2**, High Noise Scenario DNL increases would range from 0 to 4 dBA. Several POIs would still increase by a greater-than-3-dBA DNL with mitigation; however, overall, implementation of the noise mitigation measures would decrease changes to the noise setting and, therefore, lessen the potential severity of impacts at the POIs. The High Noise Scenario proposed mitigation would reduce the newly exposed area potentially affected by increased noise levels from the Proposed Action resulting in a potentially moderate impact on land use compatibility. As described above, JBLE-Langley and the surrounding communities would continue to collaborate on land use issues and develop and update land use plans as needed. With the implementation of noise mitigation measures, the impacts on land use from contract ADAIR would be long-term and moderate.

4.6.3 *No Action Alternative*

Under the No Action Alternative, there would be no addition of contract ADAIR personnel or aircraft stationed at JBLE-Langley. Contract ADAIR operations and maintenance facilities would not change from their current use; therefore, no changes would occur to the existing land use.

4.7 SOCIOECONOMICS – INCOME AND EMPLOYMENT

4.7.1 *Evaluation Criteria*

Consequences to socioeconomic resources were assessed in terms of the potential impacts on the local economy from the proposed contract ADAIR sorties. The level of impacts associated with the proposed contract ADAIR expenditure is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., property values and employment). The magnitude of potential impacts can vary greatly, depending on the location of an action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area but might have significant impacts in a rural region. In addition, if potential socioeconomic changes resulting from other

factors were to result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, they may be considered adverse.

4.7.2 *Proposed Action*

Under the Proposed Action, the Air Force would contract 4,100 sorties annually at JBLE-Langley, which requires an estimated 14 aircraft and 109 contract personnel as support for this requirement. Implementation of alternatives differs only in the facilities chosen for operations, maintenance, and aircrew briefings. Because the number and type of aircraft, using the same flight profiles and airspace are the same under both alternatives, potential impacts on socioeconomics – income and employment are the same for both alternatives.

4.7.2.1 Alternatives 1 and 2

Minor interior upgrades to Building 751 needed for aircrew flight equipment or secured storage space would be a minor requirement for materials and labor and would have no impacts on the socioeconomic condition on the region. The 109 contracted ADAIR maintenance personnel and pilots would represent a small increase in the total persons permanently assigned to and working at JBLE, where currently over 20,000 military and civilian personnel are employed.

Increased noise at sensitive receptors would occur in the city of Hampton near the airfield. Some sensitive receptors would experience a potentially significant increase in noise from the additional sorties associated with the contract ADAIR aircraft. As such, noise increases greater than the 3-dBA DNL at existing residential homes and commercial properties near these sensitive receptors in the city of Hampton area could cause a decrease in property values as the desirability to live and work in these areas would be reduced with the increased aircraft noise. Under the High Noise Scenario, the Michael's Woods residential neighborhood (POI R03) would potentially experience an 8-dBA DNL increase and go from below the 65-dBA DNL threshold where residential land uses would be compatible with the noise levels to a 71-dBA DNL, which would likely be incompatible with residential land uses. It is likely that there are commercial properties not labeled as a sensitive receptor POIs that are located near this residential neighborhood and would also experience a similar increase in noise levels. If the High Noise Scenario was chosen, these properties would be less desirable, likely reducing their value and making the properties more difficult to sell; therefore, increased noise from the contract ADAIR aircraft under the High Noise Scenario would have a potentially significant adverse impact on property values under Alternative 1 or 2. There would potentially be a minor adverse long-term impact on the value of select properties from increased noise from the contract ADAIR under the Medium and Low Noise Scenarios.

It is estimated that the maximum contracted value for ADAIR training would be $30,000 per flight hour (Headquarters ACC Acquisition Management and Integration Center, 2018), though most likely between $8,500 and $15,000 based on technical solution sought. This would therefore potentially increase annual expenditures in the region of approximately $61.5 million to support the Proposed Action. These expenditures would be in the form of purchasing fuel, equipment, and materials to support the contract ADAIR sorties as well as the employment of 109 highly skilled contracted personnel (maintainers and pilots). These increased expenditures would provide a long-term, moderate, beneficial impact on the Hampton Roads region through increased payroll tax revenue and the purchase of additional equipment, materials, and fuel needed for aircraft operations and maintenance.

4.7.2.2 Mitigation

The implementation of the noise mitigation measures under the High Noise Scenario that would reduce the noise levels from contract ADAIR aircraft at POIs near the airfield would be needed to reduce the potentially significant impact on the loss of property values in neighborhoods such as Michael's Woods (POI R03). With the implementation of the proposed mitigation measures under the High Noise Scenario, minor long-term impacts on the residential and commercial property values in the vicinity of the airfield would occur.

4.7.3 *No Action Alternative*

Under the No Action Alternative, the contract ADAIR operations would not occur at JBLE-Langley, and no expenditures would occur regionally to support contracted aircraft or sorties. As a result, there would be no direct or indirect impact on socioeconomics under the No Action Alternative.

4.8 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

4.8.1 *Evaluation Criteria*

Environmental justice analysis applies to potential disproportionate effects on minority, low-income, and youth populations. Environmental justice issues could occur if an adverse environmental or socioeconomic consequence to the human population fell disproportionately upon minority, low-income, or youth populations. Ethnicity and poverty status were examined and compared to state and national data to determine if these populations could be disproportionately affected by the Proposed Action.

4.8.2 *Proposed Action*

Under the Proposed Action, the Air Force would contract 4,100 ADAIR sorties annually at JBLE-Langley. The addition of 14 aircraft and 109 contract personnel and their families to JBLE-Langley, and the associated noise emissions from those aircraft would have the same potential to cause disproportionate impacts on minorities and children in the community regardless of the alternative location at JBLE-Langley for contract ADAIR operations and maintenance.

4.8.2.1 Alternatives 1 and 2

The increase in the number of personnel at JBLE-Langley supporting the contracted ADAIR sorties would not result in a disproportionate impact on minorities, low-income populations, and protection of children because there is adequate housing, community resources, and community services in the region; the 109 additional personnel and their families supporting the contract ADAIR requirement would not disproportionately affect the availability of these resources to minorities, low-income populations, or children.

The DNL increase under the High Noise Scenario was modeled to be at or greater than the 3-dBA DNL at selected POIs and would impact one neighborhood proximate to JBLE-Langley. The increase in the number of annual sorties and associated increase in noise from aircraft operations outside the boundaries of JBLE-Langley would directly impact persons residing and working in the city of Hampton and in the Hampton Roads region. Both the city of Hampton and the Hampton Roads region have a substantially higher percentage of the population that identifies as minority and a higher percentage of the population that is low income than in the State of Virginia and the United States. This includes the estimated 8-dBA DNL increase in the Michael's Woods residential neighborhood (POI R03) under the High Noise Scenario, which is the only residential area identified with a greater than 3-dBA DNL noise increase under the High Noise Scenario. As such, this 8-dBA DNL increase may result in disproportionate impacts on minority, low-income, and youth populations in the Michael's Woods residential neighborhood.

The Michael's Woods residential neighborhood is in Census Block 2029, Block Group 2, Census Tract 103.07, and 60 percent of this census block group is identified as a minority population; this is substantially higher than the percentage of the population that identified as a minority in the state of Virginia and in the United States. The percent of the population that is low-income and youth in Census Block 2029, Block Group 2, Census Tract 103.07 is not greater than the percentage of those populations in Virginia and the United States. Further, this Census Tract has a median family income that is 149 percent of the median family income for the state of Virginia and is considered to be in an upper income level (US Census Bureau, 2018); therefore, the noise increase from contract ADAIR aircraft operations under the High Noise Scenario may have disproportionate impacts on minority populations under Alternative 1 or 2 but not on low-income or youth populations.

Aircraft noise associated with the High Noise Scenario from contract ADAIR aircraft operations may adversely impact select schools and daycare centers in the cities of Hampton and Newport News. Increases in the DNL under the High Noise Scenario at four nearby schools considered to be POIs were modeled to be greater than 3 dBA. This is a substantial noise increase and would have potentially significant impacts on educational facilities where increased noise levels have been shown to have adverse impacts on the ability of children to learn (**Appendix B**); therefore, although the impacts from increased noise would not be disproportionate to youth populations under Alternative 1 or 2, the increased noise from contract ADAIR aircraft would have potentially significant impacts on children utilizing nearby childcare facilities and schools under both alternatives.

4.8.2.2 Mitigation

The proposed mitigation to reduce noise under the High Noise Scenario would reduce the potential noise level at residential and commercial POIs and at nearby childcare facilities and schools under both alternatives. This includes reducing the noise level increase at the Michael's Woods residential neighborhood to a 1-dBA DNL; however, Watkins Early Childhood Center (S07 POI) would have a 4-dBA DNL increase under the Proposed Action and Mitigation Scenario 2 or 5. Although this school would experience over a doubling of the noise intensity relative to baseline conditions, this POI would have an estimated 56-dBA DNL under the High Noise Scenario with the implementation of Mitigation Scenarios 2 or 5. As described in **Section 3.2.2**, in accordance with AFH 32-7084, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations and a 56-dBA DNL would not be disruptive to a school's learning environment. The Proposed Action with mitigation under the High Noise Scenario would therefore not have disproportionate impacts on minority or low income populations or to children and would result in moderate impacts on children in nearby childcare facilities and schools from increased noise levels under Alternative 1 or 2.

4.8.3 *No Action Alternative*

Contract ADAIR operations would not occur at JBLE-Langley under the No Action Alternative; therefore, regional expenditures to support contracted aircraft or from the increased training sorties would not disproportionate impact minority or low-income communities or children.

4.9 CULTURAL RESOURCES

4.9.1 *Evaluation Criteria*

Adverse impacts on cultural resources might include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate enforceable restrictions or conditions to ensure preservation of the property's historic significance. For the purposes of this EA, an impact is considered major if it alters the integrity of the JBLE-Langley or results in the loss of contributing resources in the historic district or potentially impacts traditional cultural properties.

4.9.2 *Proposed Action*

The Proposed Action includes elements affecting the base and military training airspace. As described in **Chapter 2**, the elements affecting the base include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the airspace include airspace use and defensive countermeasures. Impacts resulting from each alternative related to cultural resources are described below.

4.9.2.1 Alternatives 1 and 2

Architectural Resources

Under Alternatives 1 and 2, contract ADAIR operations space would be consolidated with AMU and hangar space in Hangar 751. This collocation of space would require some minor interior modifications to Hangar 751. These include the possible creation of an interior room or cage for pilots and their equipment. Contract ADAIR would provide 4,000 annual training sorties in previously established Warning Areas (W-386, W-122, and W-72).

Hangar 751 is presently considered eligible for inclusion in the NRHP as a contributing element of the Langley Field Historic District. The character defining features of Hangar 751 are located on the exterior. The interior modifications to Hangar 751 are not expected to affect any characteristics that contribute to the hangar's historic significance or its overall contribution to the historic district. Alternative 1 or 2 would therefore have no effect, and consequently no impact, on historic properties.

Traditional Cultural Properties

Six Virginia tribes, including the Chickahominy, Eastern Chickahominy, the Upper Mattaponi, the Rappahannock, the Monacan, and the Nansemond were granted federal recognition through legislative action when Congress passed the Thomasina E. Jordan Indian Tribes of Virginia Federal Recognition Act (Portnoy, 2018). They joined the Pamunkey tribe, who had attained formal federal recognition through the administrative process overseen by the US Department of the Interior (Department of Interior Bureau of Indian Affairs, 2015). The Catawba Indian Nation, the Delaware Tribe, and the Delaware Nation of Oklahoma also have a historical connection to Virginia and the coastal region (US Department of Housing and Urban Development, 2017). No known traditional cultural properties or sacred sites have been identified at JBLE-Langley nor have any been identified as part of ongoing consultation on the Proposed Action. Alternative 1 or 2 would therefore have no effect, and consequently no impact, on traditional cultural properties or sacred sites.

Archaeological Resources

No ground disturbance would take place as part of the Proposed Action; therefore, potential archaeological deposits would not be impacted. Sorties within the Warning Areas would be performed at an altitude over the Atlantic Ocean that would not affect potential submerged resources. Alternative 1 or 2 would therefore have no effect, and consequently no impact, on archaeological resources.

4.9.2.2 Mitigation

The mitigation measures developed to reduce impacts from noise under the High Noise Scenario (described in **Section 4.2.2**) would not affect cultural resources at JBLE-Langley and, therefore, have no impact on cultural resources from implementation.

4.9.3 *No Action Alternative*

This alternative provides a benchmark for assessment, preserving the status quo. Under this alternative, no additional contract ADAIR assets would be established at JBLE-Langley.

4.10 HAZARDOUS MATERIALS AND WASTES, CONTAMINATED SITES, AND TOXIC SUBSTANCES

4.10.1 *Evaluation Criteria*

Impacts on HAZMAT management would be considered adverse if the federal action resulted in noncompliance with applicable federal and state regulations, or increased the amounts generated or

procured beyond current JBLE-Langley waste management procedures and capacities. Impacts on the ERP would be considered adverse if the federal action disturbed (or created) contaminated sites resulting in negative effects on human health or the environment.

4.10.2 *Proposed Action*

Under the Proposed Action, maintenance and operations of 14 contracted ADAIR aircraft could contribute to the volume of HAZMAT stored and used at JBLE-Langley and the amount of hazardous wastes generated. Impacts associated with hazardous materials and wastes, contaminated sites, toxic substances, are limited to JBLE-Langley. As discussed previously, and emergency fuel dump could occur in the Warning Areas; however, due to the infrequent nature of fuel dumps as well as in-place safety precautions, these emergency procedures are not likely to have adverse effects.

4.10.2.1 Alternative 1

Hazardous Materials and Wastes

The quantity of HAZMAT such as oil, Jet-A fuel, hydrazine, hydraulic fluid, solvents, sealants, and antifreeze would increase with the operations and maintenance of contract ADAIR aircraft at JBLE-Langley. HAZMAT required for the contract ADAIR aircraft and used by contract personnel would be procured, controlled, and tracked through HAZMART, following established JBLE-Langley procedures. This would ensure that only HAZMAT needed for operations and maintenance at the smallest quantities would be used and that all of the HAZMAT used for contract ADAIR at JBLE-Langley would be properly tracked. ADAIR contractors are required to provide supplies, maintenance, and storage for any hydrazine storage, and these operations would be integrated with JBLE-Langley procedures.

The quantity of hazardous wastes generated would increase as a result of the contract ADAIR operations at JBLE-Langley; however, all hazardous waste generated as a result of contract ADAIR aircraft operations and maintenance would be properly handled, stored, and disposed of following the JBLE-Langley *Hazardous Waste Management Plan* (JBLE-Langley, 2017c). This ensures that hazardous waste is managed according to all federal, state, and local laws and regulations. As such, there would be no impact from the procurement and use of HAZMAT or the storage and disposal of hazardous waste.

Environmental Restoration Program

The four ERP sites proximate to Building 751 are all closed, indicating that all response actions are complete for these restoration sites. No further action is therefore necessary, and no impact would occur from the use of Building 751 for contracted ADAIR operations and maintenance.

Asbestos-Containing Materials and Lead-Based Paint

ACM have been found in Building 751 associated with floor tile, mastic, pipe insulation, and pipes. Any renovations to the interior of Building 751 to support contract ADAIR personnel would therefore require further inspection. If ACM are determined to be present in the portion of the building slated for renovation, the ACM would be properly removed and disposed of according to the *Asbestos Management and Operations Plan* (JBLE-Langley, 2017b).

LBP could be present in Building 751 as the building has never been tested for LBP. If interior renovations are needed in Building 751 to support the contract ADAIR personnel, the requirements of the *Lead-Based Paint Management and Operations Plan* would be followed and any potential LBP would be properly handled and disposed of in accordance with federal, state, and local laws.

With the implementation of the requirements described by the *Asbestos Management and Operations Plan* and *Lead-Based Paint Management and Operations Plan*, there would be no impact from potential

ACM or LBP disturbed by interior renovations of Building 751, if renovations are deemed necessary to support the contract ADAIR personnel.

Radon

There is a low potential for radon to pose a health hazard at JBLE-Langley. Further, no new construction is proposed. As such, no impact from radon is anticipated.

Polychlorinated Biphenyls

Removal of any light fixtures has the potential to disturb PCBs. If renovations of the interior of Building 751 requires the removal of fluorescent lighting fixtures that could contain PCBs, the lighting fixtures will be disposed of according to federal, state, and local laws. The removal and proper disposal of light fixtures containing PCBs is a long-term minor beneficial impact.

4.10.2.2 Alternative 2

Under Alternative 2, impacts on hazardous materials and wastes, contaminated sites, and toxic substances would be the same as those described under Alternative 1 for their respective buildings. The impacts of ACM and LBP at Building 751 are the same as described for Alternative 1. Although there is no record of ACM in Building 790, if a building is not in the ACM survey or abatement database, it does not signify the absence of ACM (JBLE-Langley, 2017b). Any renovations to the interior of Building 790 would therefore require further inspection and if ACM are determined to be present in areas where interior renovation is needed to support contract ADAIR personnel, ACM would be properly removed and disposed of according to the *Asbestos Management and Operations Plan* (JBLE-Langley, 2017b).

LBP could be present in Building 790 as the building has never been tested for LBP; however, based on the construction year, presence of LBP is unlikely. If interior renovations are needed in Building 790 to support the contracted ADAIR personnel, the requirements of the *Lead-Based Paint Management and Operations Plan* would be followed and any potential LBP would be properly handled and disposed.

With the implementation of the requirements described by the *Asbestos Management and Operations Plan* and *Lead-Based Paint Management and Operations Plan*, there would be no impact from potential ACM or LBP with interior renovations of Building 790, if determined to be necessary to support the contract ADAIR personnel.

4.10.2.3 Mitigation

The mitigation measures developed to reduce impacts from under the High Noise Scenario (described in **Section 4.2.2**) would not affect hazardous materials, hazardous wastes, contaminated sites or toxic substances and, therefore, have no impact on hazardous materials, hazardous wastes, contaminated sites or toxic substances from implementation.

4.10.3 *No Action Alternative*

Under the No Action Alternative, the contract ADAIR operations would not occur at JBLE-Langley, and no increased quantity of HAZMAT would be used and no increased quantity of hazardous wastes would be generated. No interior renovations of buildings to support contract ADAIR personnel would be required; therefore, there would be no potential disturbance of ACM, LBP, or PCBs in JBLE-Langley buildings. As a result, there would be no direct or indirect impact on any HAZMAT or hazardous or special wastes under the No Action Alternative.

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CHAPTER 5 CUMULATIVE IMPACTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

This section includes an analysis of the potential cumulative impacts by considering past, present, and reasonably foreseeable future actions; potential unavoidable adverse impacts; the relationship between short-term uses of resources and long-term productivity; and irreversible and irretrievable commitment of resources.

5.1 CUMULATIVE EFFECTS

The CEQ regulations stipulate that the cumulative effects analysis considers the potential environmental consequences resulting from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR § 1508.7). In addition, CEQ published guidance for addressing and analyzing cumulative impacts under NEPA. CEQ's publication, *Considering Cumulative Effects Under the National Environmental Policy Act*, January 1997, provides additional guidance for conducting an effective and informative cumulative impacts analysis.

This section identifies and evaluates past, present, and reasonably foreseeable future projects that could cumulatively affect environmental resources in conjunction with the Proposed Action. The ROI for the cumulative effects analysis is the same as defined for each resource in **Chapter 3**. Actions identified in **Tables 5-1** and **5-2** would not interact with all resources; therefore, resources that potentially could result in a cumulative effect with the addition of the Proposed Action and alternatives are noted in these tables.

Assessing cumulative effects begins with defining the scope of other actions and their potential interrelationship with the Proposed or alternative actions. Other activities or projects that coincide with the location and timetable of the Proposed Action and other actions are evaluated. Actions not identified in **Chapter 2** as part of the Proposed or alternative actions, but that could be considered as actions connected in time or space (40 CFR § 1508.25) may include projects that affect areas on or near JBLE-Langley.

An effort has been made to identify actions that are being considered or are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the CAF ADAIR JBLE-Langley EA Proposed or alternative actions, these actions are included in this cumulative analysis. This approach enables decision makers to have the most current information available in order that they can evaluate the potential environmental consequences of the Proposed Action.

5.2 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Past, present, and reasonably foreseeable actions by the Air Force on JBLE-Langley as well as in the region were considered.

5.2.1 *Air Force Actions*

Recent past and ongoing military actions at JBLE-Langley were considered as part of the baseline or existing condition in the appropriate ROI. Each project summarized in this section was reviewed to consider the implication of each action with the Proposed or alternative actions. Potential overlap in affected area and project timing were considered.

JBLE-Langley is an active military installation that experiences continuous evolution of mission and operational requirements. All projects must comply with land use controls, which include safety and environmental constraints. JBLE-Langley, like other major military installations, requires new construction and infrastructure improvements. These routine projects are environmentally cleared using NEPA's Categorical Exclusion process and would continue to occur during operation of the Proposed Action. In

addition to these routine projects, **Table 5-1** lists the past, present, and reasonably foreseeable future major Air Force projects anticipated to occur on the base. Anticipated future off-base projects that may overlap in the potentially affected area or project timing with the Proposed Action were also considered and are discussed in **Section 5.2.3** below.

Table 5-1
Past, Present, Reasonably Foreseeable Future Projects at Joint Base Langley-Eustis, Langley Air Force Base

Scheduled Project	Project Summary	Implementation Date	Relevance to Proposed Action	Potentially Affected Resources
Past Actions				
Initial F-22 Operational Wing Beddown EIS	Project involved initial beddown of the F-22 at Langley AFB.	Final EIS November 2001	Past action is part of the existing conditions for the Proposed Action.	Airspace Management and Use, Air Quality, Noise, Socioeconomics – Income and Employment
Force Structure Changes Final EA and Finding of No Significant Impact	Project included structure changes adding six F-22 training aircraft and beddown of up to 14 T-38A training aircraft.	Final EA October 2011	Past action is part of the existing conditions for the Proposed Action.	Airspace Management and Use, Air Quality, Noise, Socioeconomics – Income and Employment
Renew the License with the Civil Air Patrol to Occupy the Former Aero Club	Project included renewing license with the Civil Air Patrol to occupy the former Aero Club; providing office and hangar space; adding parking on airfield parking ramp; using aviation gasoline fuel tank; and allowing for the potential addition of four aircraft over time (Categorical Exclusion).	2016	Past action is part of the existing conditions for the Proposed Action.	Airspace Management and Use, Air Quality, Noise
Present Actions				
Draft Back River EA	Project includes dredging of the Back River Navigation Chanel to provide and maintaining a safe operational channel for vessel transit to JBLE-Langley.	Draft EA, September 2017	Proposal is located adjacent to the base and would provide fuel vessels to JBLE-Langley.	No direct impact on JBLE-Langley
Final Installation Development EA for JBLE-Langley	Project evaluated potential impacts associated with identified priority installation development projects while the JBLE-Langley Installation Development is under revision. Priority installation projects are proposed to be constructed over the next 5 years.	Final EA, September 2016	Construction on priority installation projects may overlap with the renovation activities of the Proposed ADAIR Action.	Air Quality, Noise, Land Use, Socioeconomics – Income and Employment
F-22 Increase to 24 Primary Aircraft Authorized	The F-22 aircraft assigned to the 95th FS would be temporarily consolidated into other squadrons at JBLE-Langley, Elmendorf AFB, Hickam AFB, and Nellis AFB.	Federal Register, Notice of Intent May 2019	JBLE-Langley received three F-22 aircraft assigned to the 27th FS, three F-22 aircraft assigned to the 94th FS, and one F-22 BAI aircraft resulting in an increase in overall operations.	Airspace Management and Use, Air Quality, Noise

Table 5-1
Past, Present, Reasonably Foreseeable Future Projects at Joint Base Langley-Eustis, Langley Air Force Base

Scheduled Project	Project Summary	Implementation Date	Relevance to Proposed Action	Potentially Affected Resources
Future Actions				
Fifth Generation Fighter Training Optimization EIS	Project involves permanent beddown of the F-22 FTU at Langley AFB. This EIS includes analysis of moving the F-22 FTU and T-38 (displaced from Tyndall AFB due to Hurricane Michael) currently at Eglin AFB, Florida, to Langley AFB, Virginia, and bedding down a second F-35A FTU squadron at Eglin AFB.	Public Scoping May 2019	Beddown implementation could occur within the same timeframe as contract ADAIR implement.	Airspace Management and Use, Noise, Air Quality
ISR Campus Development Project	Project includes consolidation of ISR functions into one walkable campus and connected quads. It is in the planning stages for future development. Several projects associated include proposed new facility construction, upgrades to roadways, and repurposing of facilities.	Development Plan Final 2019, implementation unknown	Construction could potentially overlap with ADAIR implementation.	Air Quality, Socioeconomics – Income and Employment
Fast Start Peaker Plant	An EA is underway for the lease and construction of a natural gas turbine electric generating facility. Approximate footprint of facility is 6 acres.	EA 2019	Cumulative impact on air quality is possible with the addition of the contract ADAIR action.	Air Quality, Land Use
EA for Selected Capital Improvement Projects	Project includes construction, renovation, or demolition of several facilities at Langley AFB including a new Fuels System Maintenance Hangar and Fuels Automated System Complex. A total of 371,968 square feet would eventually be constructed and 22 buildings demolished.	Ongoing	Construction may overlap with proposed contract ADAIR implementation.	Air Quality, Noise, Land Use

Notes:
ADAIR = adversary air; AFB = Air Force Base; BAI = backup aircraft inventory; EA = environmental assessment; EIS = Environmental Impact Statement; FS = Fighter Squadron; FTU = formal training unit; ISR = Intelligence, Surveillance, and Reconnaissance; JBLE-Langley = Joint Base Langley-Eustis, Langley Air Force Base

5.2.2 *Other Military/Government Actions*

Past and ongoing military or government agency actions surrounding JBLE-Langley were considered as part of the baseline or existing condition in the appropriate ROI (**Table 5-2**). Each project summarized in this section was reviewed to consider the implication of each action with the Proposed or alternative actions. Potential overlap in the affected area and project timing were considered.

Table 5-2
Past, Present, Reasonably Foreseeable Other Military Actions

Scheduled Project	Project Summary	Implementation Date	Relevance to Proposed Action	Potentially Affected Resources
Establishment of Restricted Area Airspace-6604 CDE at Wallops Flight Facility	National Aeronautics and Space Administration proposal for additional restricted airspace in the Wallops Flight Facility, Accomack County, Virginia	Draft EA, July 2016	Proposed restricted airspace is adjacent to and could potentially encroach on the Proposed ADAIR Action airspace (W-386).	Airspace Management and Use
Atlantic Fleet Training and Testing Draft Environmental Impact Statement/ Overseas Environmental Impact Statement	United States Navy proposal to conduct military readiness training activities using active sonar and explosives within existing range complexes and areas located in the Atlantic Ocean, Caribbean Sea, and the Gulf of Mexico.	Final EIS, 2018	Proposed training activities are located and underlie military airspace described in the Proposed ADAIR Action.	Airspace Management and Use, Noise, Safety, Biological Resources

Notes:
ADAIR = adversary air; EA = Environmental Assessment

5.2.3 *Nonfederal Actions*

Nonfederal actions such as new development or construction projects occurring in the area surrounding JBLE-Langley were considered for potential cumulative impacts. The JBLE-Langley is bordered by the city of Hampton to the south and west, Poquoson to the north, NASA facilities to the northwest, and the Back River to the east. The city of Hampton is 91 percent built out with limited land for development (City of Hampton, 2010). Developable land surrounding the installation is scarce. Zoning ordinances are in place to ensure that any future development immediately adjacent to the installation's boundaries are compatible with military aircraft operations to avoid encroachment within the installation's safety zones (City of Hampton, 2010). As such, new and future development or construction projects surrounding JBLE-Langley that could result in an incremental cumulative effect was not identified.

Two large transportation projects were identified for future development in the Hampton Roads area, the Interstate-64 widening and the Hampton Roads Third Crossing project (City of Hampton, 2010). Neither of these proposed projects is located in the immediate vicinity of the base boundary nor would they directly affect access to the JBLE-Langley. No nonfederal actions were considered in the cumulative effects analysis.

5.3 CUMULATIVE EFFECTS ANALYSIS

The following analysis considers how projects identified in **Tables 5-1** and **5-2** could cumulatively result in potential environmental consequences with the Proposed Action including the mitigation measures developed for the High Noise Scenario. As noted previously, the type of aircraft that would be used by

contract ADAIR is unknown at this time. The mitigation would only apply if aircraft similar to the High Noise Scenario comprise the contract ADAIR aircraft.

5.3.1 *Airspace Management and Use*

Cumulative impacts on airspace management and use from mitigated contract ADAIR operations, in addition to past, present, and reasonably foreseeable future actions are not expected. The Atlantic Fleet Training and Testing would take place in waters underlying the Warning Areas proposed for the contract ADAIR action; these activities are not expected to result in cumulative impacts on the Proposed Action airspace. The F-22 Consolidation project would perform training in W-386, W-72, and W-122, adding approximately 1,031 sorties. No airspace modifications are expected; however, additional scheduling efforts may be required for training activities. As such, adverse cumulative impacts on airspace management and use are not anticipated.

5.3.2 *Noise*

The Proposed Action would result in negligible, minor, and potentially major impacts on noise under the Low, Medium, and High Noise Scenarios, respectively. Mitigation was developed for the High Noise Scenario and implementation of that mitigation would result in minor to moderate impacts. Refer to **Section 4.2.2.2** and **Appendix E** for a discussion of mitigation. JBLE-Langley is an active military installation with several construction and maintenance projects proposed as described in the Final Installation Development EA during the same period as the Proposed Action at JBLE-Langley; however, since construction noise is localized to the construction sites and would be short-term, no long-term cumulative noise impacts are anticipated. The Proposed Action when added to past, present, and reasonably foreseeable future actions at JBLE-Langley would result in a potential adverse, incremental cumulative impact on noise; however, the impact would be less than significant. The addition of contract ADAIR aircraft and future Proposed Actions by the Navy could increase the number of sonic booms in the Warning Areas; but this increase is expected to be negligible in the proposed ADAIR airspace compared to what currently exists; therefore, no cumulative effect on noise is expected in the airspace.

5.3.3 *Safety*

The Proposed and alternative actions, in addition to past, present, and reasonably foreseeable actions on and off JBLE-Langley are consistent with existing safety procedures and policies; therefore, no cumulative impacts on safety are anticipated. Safety zones would not change under contract ADAIR. Contract personnel would be trained and required to follow safety procedures in accordance with established aircraft flight manuals as implement by the contract. Training sorties would increase by approximately 29 percent during ADAIR implement. This increase could pose an increased risk to flight safety; however, through compliance with the BASH plan and flight safety rules, the cumulative impact would be minimized. As such, no cumulative impacts on ground and flight safety would be expected with implementation of the mitigated Proposed Action.

5.3.4 *Air Quality*

The Proposed Action, in addition to past, present, and reasonably foreseeable future actions on and off JBLE-Langley would result in a less than significant cumulative impacts on air quality. With the addition of ongoing construction and maintenance projects on JBLE-Langley, including the Intelligence, Surveillance, and Reconnaissance Campus Development and Fuels System construction, PM_{10} emissions could increase; however, these increases would be short in duration and the incremental impact on air quality would be negligible. The proposed Fast Start Peaker Plant would potentially increase air emissions; however, those emissions are expected to be minimal and within the 10 percent regional threshold.

Although the recent action by US Court of Appeals could result in the redesignation of the Hampton Roads Air Quality Control Region as an ozone maintenance area, the worst-case scenario for contract ADAIR emissions for the pollutants of concern (nitrogen oxides [NO_x] and volatile organic compounds)

are over 30 percent less than the 100 tons per year *de minimis* threshold for conformity. Further, the worst-case emission (i.e., the highest NO_x emission) is only 0.080 percent of the countywide stationary source NO_x emissions. Therefore, no cumulative air quality impact is anticipated.

ADAIR training activities would occur at times below the mixing height (3,000 ft AGL) (see **Section 4.2.1**) in the proposed Warning Areas for ADAIR operations; however, the duration would be short (approximately 11.4 minutes per sortie); therefore, impacts on air quality would not be significant. Overall, no incremental change to air quality is expected when adding the mitigated Proposed Action to past, present, and reasonably foreseeable future actions; therefore, cumulative impacts on air quality is expected to be negligible. Cumulative impacts from GHG emissions is expected to be minimal to climate change.

5.3.5 *Biological Resources*

No significant cumulative effects on biological resources including threatened and endangered species, wildlife, vegetation, and coastal wetlands are expected from the Proposed and alternative actions, in combination with past, present, and reasonably foreseeable actions on JBLE-Langley. With an increase in air operations associated with the Proposed Action, there is an increased cumulative risk of aircraft bird strikes. Compliance with the JBLE-Langley BASH prevention program would reduce the potential cumulative risk associated with aircraft bird conflicts. The increased use of chaff and flares in combination with the deposition of plastic and other debris in the Atlantic Ocean, along with the use of the Warning Areas for extensive US Navy training operations, would have the potential for cumulative impacts on avian and marine species; however, the volume and size of plastic components from chaff and flares are very small. Cumulatively, the deposition of plastic components may affect but is not likely to adversely affect federally listed species occurring in the marine environment; therefore, there would be no significant cumulative effects on biological resources.

5.3.6 *Land Use*

The mitigated Proposed Action, in addition to past, present, and reasonably foreseeable actions on and off JBLE-Langley would result in an incremental change to land use compatibility with surrounding land uses from changes in the noise setting; however, cumulative impacts on land use would be less than significant. There are several proposed maintenance and construction project at JBLE-Langley; however, the minimal interior modifications associated with Buildings 790 and 751 under both alternatives would not create a cumulative change to the surrounding on-installation land use.

5.3.7 *Socioeconomics – Income and Employment*

The Proposed and alternative actions as well as past, present, and reasonably foreseeable actions on and off JBLE-Langley would not result in an adverse cumulative impact on the region's employment; however, the mitigated Proposed Action would increase annual expenditures in the local economy to approximately $61.5 million at the installation. This along with other proposed projects at JBLE-Langley and in the surrounding area would create an economic boost to the region and represents a long-term, minor, beneficial cumulative impact on the local economy. The mitigated Proposed Action in combination with other JBLE-Langley and local construction projects may have long-term, minor, adverse cumulative impacts on property values from increased noise.

5.3.8 *Environmental Justice and Protection of Children*

The mitigated Proposed Action as well as past, present, and reasonably foreseeable actions on and off JBLE-Langley are not expected to have a disproportionate cumulative impact on minority and low-income populations or children from increased noise emissions; however, the mitigated Proposed Action in combination with other JBLE-Langley and local construction projects may have long-term, minor, adverse cumulative impacts on children through increased noise at nearby educational and childcare facilities.

5.3.9 *Cultural Resources*

The Proposed Action would require minor interior modifications to Hangar 751. Hangar 751 is considered eligible for inclusion in the NRHP as a contributing element of the Langley Field Historic District; however, the contributing features are located on the exterior of the building. As such, impacts on architectural resources would be negligible. No impacts are expected under the Proposed Action to Native American traditional cultural properties or archeological resources (on base or under the Warning Areas). When added to past, present, and reasonably foreseeable future actions on and off JBLE-Langley, potentially negligible cumulative impacts could occur to architectural resources; however, no incremental cumulative impacts are expected to cultural resources, archaeological resources, or Native American traditional cultural properties.

5.3.10 *Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances*

The mitigated Proposed Action as well as past, present, and reasonably foreseeable future actions on and off JBLE-Langley are not anticipated to result in significant cumulative impacts on the management of hazardous materials and wastes, contaminated sites, and toxic substances. Storage and quantity of jet fuels, solvents, oil, and other hazardous materials supporting contract ADAIR operations would increase in addition to past, present, and foreseeable future projects; however, this increase would result in no cumulative effect. The proposed contract ADAIR project in addition to other proposed projects on-installation would require compliance with the JBLE-Langley *Hazardous Waste Management Plan* (JBLE-Langley, 2017c). The plan ensures that procedures for managing hazardous waste are in accordance with federal, state, and local regulations; therefore, no cumulative impacts on the storage and disposal of hazardous waste would be expected. While four environmental contamination sites were identified in proximity to Building 751 and are closed, these restored sites are not expected to result in an adverse cumulative effect. The addition of the proposed contract ADAIR project, particularly with respect to renovations in Building 790, and foreseeable future projects would be required to adhere to *Asbestos Management and Operations Plan* and the *Lead-Based Paint Management and Operations Plan* for any modifications to existing structures. No significant adverse cumulative impacts on hazardous materials and wastes, contaminated sites, and toxic substances are expected.

5.4 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

CEQ regulations (Section 1502.16) specify that analysis must address "…the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Attention should be given to impacts that narrow the range of beneficial uses of the environment in the long term or pose a long-term risk to human health or safety. This section evaluates the short-term benefits of the proposed project compared to the long-term productivity derived from not pursuing the Proposed or alternative actions.

Short-term effects on the environment are generally defined as a direct consequence of a project in its immediate vicinity. For example, short-term effects could include localized disruptions from construction. BMPs in place for each project should reduce potential impacts or disruptions.

The Proposed Action involves providing dedicated contract ADAIR sorties to employ adversary tactics within existing airspace. There would be no short-term effects on the airspace proposed for use by contract ADAIR sorties and, therefore, would not adversely affect the long-term productivity and future use of Warning Areas W-93, W-122, or W-386. The Proposed Action also includes elements affecting the base such as contract ADAIR aircraft, facilities, maintenance, and personnel. Under the Proposed Action, there would be no new construction. Existing installation facilities would be used with some internal modifications. While other maintenance activities would be occurring in proximity to the Proposed Action facilities, construction associated with these modifications represent a negligible effect on the short-term use of construction labor, goods, and services. No negative effects are expected from the Proposed Action short-term use or long-term productivity.

5.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects result primarily from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action.

The Proposed Action would use existing airspace to conduct contract ADAIR activities and would not result in an irreversible and irretrievable commitment of resources; however, the Proposed Action calls for an additional 4,100 sorties which represent an increase of 25 percent in the number of operations at JBLE-Langley. As such, flight operations and training would result in the consumption of additional fuel which represents an increase in the irreversible and irretrievable commitment of fuels. The addition of 109 personnel to support the Proposed Action also would create additional fuel consumption from daily commute travel to and from the base. Consumption of fuel associated with the Proposed Action, in addition to the total use of available fuels, is expected to result in a negligible decrease to the overall supply of regional petroleum resources. No significant irreversible or irretrievable commitment of resources are anticipated from implementing the Proposed Action.

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CHAPTER 7 REFERENCES

AFCEC. 2017a. *Air Emissions Guide for Air Force Mobile Sources, Methods for Estimating Emissions of Air Pollutants for Mobile Sources at U.S. Air Force Installations*. Prepared by Solutio Environmental, Inc. September.

AFCEC. 2017b. *Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2*. Prepared by Solutio Environmental, Inc. August.

Air Force Safety Center. 2018. *USAF Wildlife Strikes by Altitude (AGL) FY 1995-2016*.

Air Force. 1997. *Environmental Effects of Self-protection Chaff and Flares: Final Report*. Prepared for Headquarters Air Combat Command, Langley Air Force Base, Virginia.

Air Force. 2001. *Initial F-22 Operational Wing Beddown Final Environmental Impact Statement*. November.

Air Force. 2006. *F-22A Beddown Environmental Assessment, Elmendorf Air Force Base*. Appendix E: Review of Effects of Aircraft Noise, Chaff, and Flares on Biological Resources.

Air Force. 2018. *Performance Work Statement for the Combat Air Forces (CAF) Contract Air Support (CAF CAS)*. Version 1.1. October.

American National Standards Institute. 1988. *Quantities and Procedures for Description and Measurement of Environmental Sound: Part 1, ANSI S12.9-1988*.

Auman, H. J., J. P. Ludwig, J. P. Giesy, and T. Colborn. 1997. *Plastic Ingestion by Laysan Albatross Chicks on Sand Island, Midway Atoll, in 1994 and 1995*. In G. Robinson and R. Gales (Eds.), Albatross Biology and Conservation, pp. 239–244. Surrey Beatty and Sons, Chipping Norton.

Berglund, B., and T. Lindvall, eds. 1995. *Community Noise.* Center for Sensory Research 2(1):1-195.

Blanton, Dennis B., and Samuel G. Margolin. 1994. *An Assessment of Virginia's Underwater Cultural Resources.* Virginia Department of Historic Resources, Survey and Planning Report Series No. 3, College of William and Mary.

Bureau of Labor Statistics. 2018. *Virginia Beach Area Economic Summary*. 4 January.

CBF. 2018. *Climate Change*. <http://www.cbf.org/issues/climate-change/>. Accessed 5 July 2016.

CCS. 2006. *Preparation of Virginia Greenhouse Gas Reference Case Inventory and Forecast*. Prepared for the Virginia Environmental Endowment.

City of Hampton. 2010. *Hampton-Langley Joint Land Use Study*. Prepared by Matrix Design Group, Inc. August.

Cook, Jody. 2000. *A Place Called Langley Field: National Significance in American Military and Civil Aviation*. Virginia Aviation History Project.

Cowardin, L.M., V. Carter, F.C. Golet, and E. T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. US Department of Interior, Fish and Wildlife Service. FWS/OBS-79/31. December 1979.

Czech, J.J. and K.J. Plotkin. 1998. *NMAP 7.0 User's Manual*. Wyle Research Report WR 98-13. Wyle Laboratories, Inc. November.

Department of the Interior, Bureau of Indian Affairs. 2015. *Final Determination for Federal Acknowledgment of the Pamunkey Indian Tribe*.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Wetlands Research Program Technical Report Y-87-1. US Army Corps of Engineers Waterways Experiment Station. January.

Federal Interagency Committee on Noise. 1992. *Federal Agency Review of Selected Airport Noise Analysis Issues*. August.

Grubb, T.Y, D.K. Delaney, W.W. Bowerman, and M.R. Weirda. 2010. *Golden Eagle Indifference to Heli-skiing and Military Helicopters in Northern Utah*. Journal of Wildlife Management 74:1275-1285.

Harris, C.M. 1979. *Handbook of Noise Control*. McGraw-Hill Book Co.

Headquarters ACC Acquisition Management and Integration Center. 2018. *Memorandum for CAF ADAIR (Solicitation No. FA4890-17-R-0007) – Maximum Price Per Flying Hour*. Provided to CAF ADAIR Interested Parties. 02 April.

Holland, Jeffrey H. 2012. *Atlantic Outer Continental Shelf Shipwreck Database, An Updated Inventory and Distribution Analysis.* Prepared by Jeffrey L. Holland, Senior Historian, TRC.

JBLE. 2012. *National Register of Historic Places Registration Form for the Langley Field Historic District (Revision 2)*. Plano, Texas.

JBLE. 2013. *Joint Base Langley-Eustis, Virginia General Plan Update*. Prepared by Woolpert, Inc. December.

JBLE. 2016a. *Economic Impact Analysis Fiscal Year 2016*.

JBLE. 2016b. *Joint Base Langley-Eustis Air Installations Compatible Use Zones (AICUZ) Study, Draft (90%).* August.

JBLE. 2017a. *Installation Development Plan*. May.

JBLE. 2017b. *Joint Base Langley-Eustis, Langley Component, Integrated Cultural Resources Management Plan, Volume I*. Hampton, Virginia.

JBLE-Langley. 2007. *Langley Air Force Base Environmental Restoration Program Site Summaries*. Prepared for ACC. December.

JBLE-Langley. 2014. *JBLE-Langley and Big Bethel Reservoir Integrated Natural Resources Management Plan*. Headquarters 633d Air Base Wing. 2 October.

JBLE-Langley. 2016. *Final Environmental Assessment for Installation Development at JBLE-Langley, Virginia*. September.

JBLE-Langley. 2017a. *JBLE-Langley 2017 Integrated Natural Resources Management Plan (INRMP) Annual Review Letter Summary Report*. 30 September.

JBLE-Langley. 2017b. *Joint Base Langley Langley-Eustis Asbestos Management and Operations Plan, Headquarters 633d Air Base Wing*. 9 August 2011 with changes on 9 June 2017.

JBLE-Langley. 2017c. *US Air Force Hazardous Waste Management Plan, Joint Base Langley-Eustis*. 2 February.

Lucas, Michael J. and Paul T. Calamia. 1997. *Military Operating Area and Range Noise Model MR_NMAP User's Manual*. Wyle Laboratories, Inc. Research Report WR 94-12-R. March.

Moore, William H., David W. Lewes, Courtney J. Birkett. 2009. *Supplemental Archaeological Evaluation of Site 44HT0096, Langley Air Force Base, City of Hampton, Virginia*. William and Mary Center for Archaeological Research, Williamsburg, Virginia. Submitted to Geo-Marine, Hampton, Virginia.

Moore, William H., Elizabeth J. Monroe, David W. Lewes, and Courtney J. Birkett. 2006. *Archaeological Evaluation of Eleven Sites, Langley Air Force Base, City of Hampton, Virginia.* William and Mary Center for Archaeological Research, Williamsburg, Virginia. Submitted to Geo-Marine, Newport News, Virginia.

Moser, M. L., and D. S. Lee. 1992. *A Fourteen-Year Survey of Plastic Ingestion by Western North Atlantic Seabirds*. Colonial Waterbirds 15(1):83–94.

Moyle, Peter B. and Joseph J. Cech. 2004. *Fishes: An Introduction to Ichthyology*. 726 pages.

NASA. 2017a. *Langley Research Center*. <https://crgis.ndc.nasa.gov/historic/Langley_Research_Center>. Accessed 13 February 2018.

NASA. 2017b. *NASA Armstrong Fact Sheet: Sonic Booms*. <https://www.nasa.gov/centers/armstrong/news/FactSheets/FS-016-DFRC.html>. Accessed 10 October 2018.

National Park Service. 2002. *How to Apply the National Register Criteria for Evaluation.* National Register Bulletin 15. Washington, DC, US Department of the Interior, Interagency Resources Division. <https://www.nps.gov/nr/publications/bulletins/nrb15/nrb15_4.htm>. Accessed February 2018.

NMFS. 2018. *Find A Species*. <https://www.fisheries.noaa.gov/find-species>. Accessed May 2018.

NMFS. 2019a. *Species Directory, Atlantic Sturgeon*. <https://www.fisheries.noaa.gov/species/atlantic-sturgeon>. Accessed March 2019.

NMFS. 2019b. *Species Directory, Shortnose Sturgeon*. <https://www.fisheries.noaa.gov/species/shortnose-sturgeon>. Accessed March 2019.

NOAA. no date. *Wrecks and Obstructions Database.* <https://nauticalcharts.noaa.gov/data/wrecks-and-obstructions.html>.Accessed February 2018.

NOAA Fisheries. 2019. North Atlantic Right Whale Fact Sheet. <https://www.fisheries.noaa.gov/species/north-atlantic-right-whale>. Accessed April 2019.

Plotkin, K.J. 1993. *Sonic Boom Focal Zones from Tactical Aircraft Maneuvers. Journal of Aircraft, Volume 30, Number 1*. January-February.

Plotkin, K.J. 2002. *Computer Models for Sonic Boom Analysis: PCBoom4, CABoom, BooMap, CORBoom*. Wyle Laboratories Research Report WR 02-11. June.

Portnoy, Jenna. 2018. *Senate Sends Bill Recognizing Six Virginia Indian Tribes to President Trump's Desk*. Virginia Politics Section, *Washington Post*. <https://www.washingtonpost.com/local/virginia-politics/senate-sends-bill-recognizing-six-virginia-indian-tribes-to-president-trumps-desk/2018/01/11/80c56260-f6f3-11e7-b34a-b85626af34ef_story.html?utm_term=.2664e6a4bf00>. Accessed February 2018.

Provencher, J., A. Bond, A. Hedd, W. Montevecchi, S. Muzaffar, S. Courchesne, H. Gilchrist, S. Jamieson, F. Merkel, K. Falk, J. Durinck, and M. Mallory. 2014. *Prevalence of Marine Debris in Marine Birds from the North Atlantic*. Marine Pollution Bulletin 84:411–417.

Roth, D., and H. Cobb. 2001. *Virginia Tropical Cyclone Climatology*. NOAA Hydrometeorological Prediction Center, Camp Springs, Maryland, and NWS Forecast Office, Wakefield, Virginia. <https://www.wpc.ncep.noaa.gov/research/roth/vaclimohur.htm>. Accessed 17 July 2018.

Schultz, T.J. 1978. *Synthesis of Social Surveys on Noise Annoyance*. Journal of the Acoustical Society of America 64(2):377-405. August.

Spargo, Dr. Barry. 2007. Personal communication between Dr. Barry Spargo, Naval Research Laboratory, and Mark Collins, Parsons, 1 June 2007, as cited in the Gulf of Alaska Naval Training Activities Environmental Impact Statement/Overseas Environmental Impact Statement, March 2011.

Stewart, Brynn, Bradley Burkholder, Matthew Gill, and Duane Peter. 2010. *Phase I Archaeological Surveys of Proposed MILCON Sites, Langley Air Force Base*.

Stusnick, E., K.A. Bradley, J.A. Molino, and G. DeMiranda. 1992. *The Effect of Onset Rate on Aircraft Noise Annoyance, Volume 2: Rented Home Experiment*. Wyle Laboratories Research Report WR 92-3. March.

The Heritage Foundation. 2015. *2016 Index of U.S. Military Strength: Assessing America's Ability to Provide for the Common Defense*. Davis Institute for National Security and Foreign Policy.

US Census Bureau. 2018a. *US Census Bureau American Fact Finder.* <https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>. Accessed February 2018.

US Census Bureau. 2018b. *US Census Bureau QuickFacts for the United States.* <https://www.census.gov/quickfacts/fact/table/US/PST045216>. Accessed February 2018.

US Climate Data. 2018a. *Climate Data for Hampton, Virginia*. < https://www.usclimatedata.com/climate/hampton/virginia/united-states/usva1366>. Accessed 17 July 2018.

US Climate Data. 2018b. *Climate Data for Norfolk, Virginia*. <https://www.usclimatedata.com/climate/norfolk/virginia/united-states/usva0557>. Accessed 17 July 2018.

US Department of Housing and Urban Development. 2017. *Tribal Directory Assessment Tool (TDAT).* Community Planning and Development, Office of Environment and Energy, Environmental Planning Division. <https://egis.hud.gov/tdat>. Accessed 20 February 2018.

US Navy. 2009. *Virginia Capes Range Complex Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).* Prepared by the US Fleet Forces. March.

US Navy. 2017. *Atlantic Fleet Training and Testing Draft Environmental Impact Statement/Overseas Environmental Impact Statement*. June.

US Surgeon General. 2005. *Surgeon General Releases National Health Advisory on Radon*. US Department of Health and Human Services. January.

USEIA. 2018. *Energy - Related Carbon Dioxide Emissions by State, 2000-2015*. January.

USEPA. 1978. *Protective Noise Levels*. Office of Noise Abatement and Control, Washington, DC. USEPA Report 550/9-79-100, November.

USEPA. 2008. *PCBs—Basic Information*. <http://www.epa.gov/wastes/hazard/tsd/pcbs/pubs/about.htm>. Accessed June 2015.

USEPA. 2009. *AP 42, Fifth Edition, Volume I, Chapter 15: Ordnance Detonation*.

USEPA. 2011. *PSD and Title V Permitting Guidance for Greenhouse Gases*. USEPA Report 457/B-11-001. March.

USEPA. 2017. *Profile of Version 1 of the 2014 National Emissions Inventory*. Office of Air Quality Planning and Standards, Emissions Inventory and Analysis Group. April.

USEPA. 2018. *Radon: Where You Live*. <https://www.epa.gov/radon/find-information-about-local-radon-zones-and-state-contact-information#radonmap>. Accessed February 2018.

USEPA. 2019. *Climate Change Indicators: Ocean Acidity*. <https://www.epa.gov/climate-indicators/climate-change-indicators-ocean-acidity>. Accessed April 2019.

USFWS. 2018a. *Environmental Conservation Online System*. <https://ecos.fws.gov/ecp/>. Accessed May 2018.

USFWS. 2018b. *Northern Long-Eared Bat, Myotis septentrionalis Fact Sheet.* <https://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html>. Accessed May 2018.

VDEQ. 2016. *Emission Inventory*. <https://www.deq.virginia.gov/Programs/Air/AirQualityPlanningEmissions/EmissionInventory.aspx>. Accessed 12 July 2018.

VDGIF. 2018. *Threatened, Endangered, and Special Concern Species*. <https://www.dgif.virginia.gov/wildlife/>. Accessed May 2018.

Venable, J. 2016. *Fighter Pilots Aren't Flying Enough to Hone the Skills of Full-Spectrum War. Defense One*. 21 November. <http://www.defenseone.com/ideas/2016/11/fighter-pilots-arent-flying-enough-hone-skills-full-spectrum-war/133328/>. Accessed 16 March 2018.

Virginia Department of Historic Resources. no date. *Virginia Cultural Resources Information System*. <https://vcris.dhr.virginia.gov/vcris/Mapviewer/>. Accessed February 2018.

Virginia Department of Transportation. 2016. *Air Quality Technical Report*. Prepared in support of the Hampton Roads Crossing Study Supplemental Environmental Impact Statement. VDOT Project #0064-965-081, P101. July.

Wasmer, F., and F. Maunsell. 2006a. *BaseOps 7.3 User's Guide*. Wasmer Consulting.

Wasmer, F., and F. Maunsell. 2006b. *NMPlot 4.955 User's Guide*. Wasmer Consulting.

Yamashita, R., H. Takada, M. A. Fukuwaka, and Y. Watanuki. 2011. *Physical and Chemical Effects of Ingested Plastic Debris on Short-Tailed Shearwaters, Puffinus tenuirostris, in the North Pacific Ocean*. Marine Pollution Bulletin 62(12):2845-2849.

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APPENDICES

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APPENDIX A

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

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Appendix A-1

Interagency and Intergovernmental Coordination for Environmental Planning – Description of Proposed Action and Alternatives

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mayor Donnie Tuck
City of Hampton, Virginia
8th Floor, City Hall
22 Lincoln Street
Hampton VA 23669

Dear Mayor Tuck

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Global Power For America

receipt of this letter to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley, VA 23665-2107 or by electronic mail to david.jennings.4@us.af.mil. Thank you in advance for your consideration.

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Neil Morgan
York County Administrator
PO Box 532
Yorktown VA 23690-0532

Dear Mr. Morgan

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Everett Skipper, PE, BCEE
Director of Engineering
Department of Engineering
2400 Washington Ave
Newport News VA 23607

Dear Mr. Skipper

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Christopher DeHart
Environmental Services Manager
419 North Armistead Avenue
Hampton VA 23669

Dear Mr. DeHart

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Gene Crabtree
USDA-NRCS
203 Wimbledon Lane
Smithfield VA 23430

Dear Mr. Crabtree

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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Ms. Brenda W. Cook
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37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Nora Theodore
Office of Environmental Programs
US EPA, Region III
1650 Arch Street (3EA30)
Philadelphia PA 19103

Dear Ms. Theodore

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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Ms. Brenda W. Cook
633 CES/CD
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JBLE-Langley VA 23665-2107

19 Sep 2018

Ms. Cindy Schulz, Field Supervisor
Ecological Services
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester VA 23061

Dear Ms. Schulz

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Ms. Brenda W. Cook
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37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Dave O'Brien
Habitat Conservation Division, NOAA
PO Box 1346
7580 Spencer Road
Gloucester Point VA 23062

Dear Mr. O'Brien

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Ms. Bettina Sullivan
VA Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street
Richmond VA 23219

Dear Ms. Sullivan

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Craig R. Nicol
VA Department of Environmental Quality-TRO
5636 Southern Boulevard
Virginia Beach VA 23462

Dear Mr. Nicol

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LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Raymond T. Fernald
Environmental Services Section
VA Department of Game & Inland Fisheries
4010 West Broad Street
Richmond VA 23230

Dear Mr. Fernald

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Tony Watkinson
Habitat Management Division
VA Marine Resources Commission
2600 Washington Avenue, Third Floor
Newport News VA 23607

Dear Mr. Watkinson

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Ms. Rene Hypes
Department of Conservation and Recreation
600 East Main Street
Richmond VA 23219

Dear Ms. Hypes

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

The Proposed Action is to contract the support of approximately 4,100 ADAIR flights annually by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be made ready for the ADAIR mission.

A summary of the Description of Proposed Action and Alternatives (DOPAA) is attached for your review. Please provide comments or requests for additional information within 30 days of

Global Power For America

receipt of this letter to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley, VA 23665-2107 or by electronic mail to david.jennings.4@us.af.mil. Thank you in advance for your consideration.

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Roy Soto
VA Department of Health
PO Box 2448
Richmond VA 23218

Dear Mr. Soto

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Dave Davis
Wetlands & Water Protection Program
629 East Main Street, 9th Floor
Richmond, VA 23219

Dear Mr. Davis

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Brenda W. Cook

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Deputy Base Civil Engineer

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DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Keith Tignor
Office of Plant & Pest Services
1100 Bank Street
Richmond VA 23219

Dear Mr. Tignor

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Brenda W. Cook

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Deputy Base Civil Engineer

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. R. N. (Rusty) Harrington, Manager
Planning & Environmental Section
Department of Aviation
5702 Gulfstream Road
Richmond VA 23250-2422

Dear Mr. Harrington

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. J. Randall Wheeler
City Manager
500 City Hall Avenue
Poquoson VA 23662

Dear Mr. Wheeler

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Mr. Andrew Griffey
Hampton Wetland Board
22 Lincoln Street
Hampton VA 23669

Dear Mr. Griffey

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Ms. Sarah Nystrom
USFWS Virginia Field Office
Ecological Services
6669 Short Lane
Gloucester VA 23061

Dear Ms. Nystrom

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

19 Sep 2018

Ms. Nicole Woodward
US Army Corps of Engineers - Norfolk District
CENAO-WR-R
803 Front Street
Norfolk VA 23510-1096

Dear Ms. Woodward

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Deputy Base Civil Engineer

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley, VA 23665-2107

19 Sep 2018

Ms. Julie Crocker
Acting Assistant Regional Administrator
NMFS Protected Resources Division, Greater Atlantic Regional Office
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Crocker:

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Pursuant to Section 7 of the Endangered Species Act, the Marine Mammal Protection Act, and the Magnuson-Stevens Fishery Conservation and Management Act, we request any further information you may have with regard to the potential effects of the Proposed Action on protected resources or sensitive marine habitats. Further, we request additional information on what listed, proposed, and candidate species or designated or proposed critical habitats may be in the action area.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

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DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley, VA 23665-2107

19 Sep 2018

Mr. David Bernhart
Assistant Regional Administrator
NMFS Protected Resources Division, Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Dear Mr. Bernhart:

This letter is being sent in accordance with U.S. Air Force requirements for Interagency and Intergovernmental Coordination for Environmental Planning. The Air Force and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, to address shortfalls in combat readiness. This will provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations, and the Air Force NEPA regulations, JBLE-Langley is in the process of preparing an Environmental Assessment to assess the potential environmental impacts of contract ADAIR support at JBLE-Langley.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Bill Harris
Catawba Indian Nation
996 Avenue of the Nations
Rock Hill SC 29730

Dear Chief Harris

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Catawba Indian Nation may have an interest; and to invite the Catawba Indian Nation to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

A summary of the Description of Proposed Action and Alternatives (DOPAA) is attached for your review. Pursuant to Section 106 of the NHPA and consistent with Air Force Instruction 90-2002, *Air Force Interactions with Federally-Recognized Tribes*, we would appreciate a response regarding potential further engagement in government-to-government consultation on this Proposed Action. We ask your assistance in identifying whether there are areas of historic, religious or cultural significance within the area of potential effects for this proposed undertaking. Regardless of whether the Tribe chooses to consult on this proposed project, the U.S. Air Force will comply with applicable laws and regulations in the event of an inadvertent discovery of archaeological or human remains.

Please provide your comments or requests for additional information at your earliest convenience. This will ensure the Air Force has sufficient time to fully consider them when preparing the Draft Environmental Assessment.

Global Power For America

I have designated Mr. David Jennings as my principal point of contact on this effort. You can reach him at 633d Civil Engineer Squadron, 37 Sweeney Blvd, JBLE-Langley, VA 23665-2107 or by electronic mail at david.jennings4@us.af.mil. Thank you in advance for your assistance.

SEAN K. TYLER, Colonel, USAF
Commander

Attachment
DOPAA Summary

cc:
Ms. Wenonah G. Haire

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Stephen Adkins
Chickahominy Indian Tribe
7240 Adkins Road
Charles City VA 23030

Dear Chief Adkins

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Chickahominy Indian Tribe may have an interest; and to invite the Chickahominy Indian Tribe to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

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Commander

Attachment
DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

President Deborah Dotson
Delaware Nation
PO Box 825
Andarko OK 73005

Dear President Dotson

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Delaware Nation may have an interest; and to invite the Delaware Nation to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

A summary of the Description of Proposed Action and Alternatives (DOPAA) is attached for your review. Pursuant to Section 106 of the NHPA and consistent with Air Force Instruction 90-2002, *Air Force Interactions with Federally-Recognized Tribes*, we would appreciate a response regarding potential further engagement in government-to-government consultation on this Proposed Action. We ask your assistance in identifying whether there are areas of historic, religious or cultural significance within the area of potential effects for this proposed undertaking. Regardless of whether the Tribe chooses to consult on this proposed project, the U.S. Air Force will comply with applicable laws and regulations in the event of an inadvertent discovery of archaeological or human remains.

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SEAN K. TYLER, Colonel, USAF
Commander

Attachment
DOPAA Summary

cc: Ms. Kimberly Penrod

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Chester "Chet" Brooks
Delaware Tribe
5100 Tuxedo Blvd.
Bartlesville OK 74006

Dear Chief Brooks

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Delaware Tribe may have an interest; and to invite the Delaware Tribe to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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Commander

Attachment
DOPAA Summary

cc:
Ms. Susan Bachor

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Gene Adkins
Eastern Chickahominy Tribe
3120 Mt. Pleasant Road
Providence Forge VA 23140

Dear Chief Adkins

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Eastern Chickahominy Tribe may have an interest; and to invite the Eastern Chickahominy Tribe to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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DOPAA Summary

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HEADQUARTERS 633D AIR BASE WING
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OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Dean Branham
Monacan Nation
PO Box 960
Amherst VA 24521

Dear Chief Branham

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Monacan Nation may have an interest; and to invite the Monacan Nation to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Lee Lockamy
Nansemond Indian Tribal Association
5005 Mosby Road
Virginia Beach VA 23455

Dear Chief Lockamy

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Nansemond Indian Tribal Association may have an interest; and to invite the Nansemond Indian Tribal Association to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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Attachment
DOPAA Summary

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief Robert Gray
Pamunkey Indian Tribe
191 Lay Landing Road
King William VA 23086

Dear Chief Gray

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Pamunkey Indian Tribe may have an interest; and to invite the Pamunkey Indian Tribe to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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Attachment
DOPAA Summary

cc:
Dr. Ashley Atkins-Spivey

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief G. Anne Richardson
Rappahannock Tribe Cultural Center
5036 Indian Neck Road
Indian Neck VA 23148

Dear Chief Richardson

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Rappahannock Tribe may have an interest; and to invite the Rappahannock Tribe to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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DOPAA Summary

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LANGLEY AIR FORCE BASE VA

OFFICE OF THE COMMANDER
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665-2522

Chief W. Frank Adams
Upper Mattaponi Indian Tribe
5932 East River Road
King William VA 23086

Dear Chief Adams

The purpose of this letter is twofold: to give you an opportunity to review and comment on a proposed action in which the Upper Mattaponi Indian Tribe may have an interest; and to invite the Upper Mattaponi Indian Tribe to participate in government-to-government consultation with Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The Proposed Action is to contract the support of approximately 4,100 Adversary Air (ADAIR) flights by individual aircraft (on average, an additional 10 to 11 takeoffs and landings from JBLE-Langley daily). Contract ADAIR would use different types of fighter aircraft available with acceptable capabilities to support training requirements. Approximately 14 contractor aircraft would be stationed at JBLE-Langley. Training activities would use airspace near JBLE-Langley that overlies the Atlantic Ocean off the coast of Maryland, Virginia and North Carolina (see attachment). JBLE-Langley has existing facilities available for use and would require minimal modification to be ready for the ADAIR mission.

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Attachment
DOPAA Summary

Attachment 1: DOPAA Summary

In order to accomplish the United States Air Force's (Air Force) mission, it is critical that combat pilots, and the Airmen supporting them, adequately train to attain proficiency on tasks they must execute during times of war and further to sustain this proficiency as they serve in the Air Force. Increasingly, fighter pilots of the Combat Air Force (CAF) have been operating at degraded levels of proficiency and training readiness due to diminishing fiscal resources. Along with insufficient budgets to support the flying hours/training requirements needed by CAF pilots, they have also had to support adversary air (ADAIR) flying missions that have minimal training value to the CAF pilots themselves. ADAIR sorties simulate an opposing force that provide a necessary and realistic combat environment during CAF training missions. Flying these ADAIR sorties requires the use of potential adversaries' tactics and procedures that may differ significantly from CAF tactics and procedures; therefore, ADAIR sorties provide minimal CAF training while taking up valuable flying hours that could otherwise be spent on core training tasks. Contract ADAIR would provide the Air Force another way to fill ADAIR sorties, improve the quality of training and readiness of CAF pilots, and allow the Air Force to recapitalize other valuable assets and training time.

The Air Force is proposing to provide dedicated contract ADAIR sorties for CAF training at Joint Base Langley-Eustis (JBLE), Virginia (**Figure 1**), to address shortfalls in F-22 pilot training and absorption capability. The Proposed Action at JBLE, Langley Air Force Base (JBLE-Langley) would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 contractor aircraft to fly an estimated 4,100 annual sorties in support of the 1st Fighter Wing and 192nd Fighter Wing and other units at JBLE-Langley. This number of contract ADAIR sorties also includes sorties expected for aircraft leaving for or returning from either maintenance or other deployments. Contract ADAIR would fly up to a projected 3 percent of the estimated 4,100 sorties during environmental night hours when the effects of aircraft noise are accentuated (10:00 pm to 7:00 am local time).

JBLE-Langley has existing facilities to support the Proposed Action. The proposed facilities are available for use and require minimal modification. They are located around the existing airfield and runway and include the necessary ramp space; maintenance space; operational space; petroleum, oil, and lubricants storage; runway access; and associated parking to support the contract ADAIR mission. JBLE-Langley has two options for providing proposed operations facilities which include operations and aircraft maintenance functions. Operations space may either be in a stand-alone operations facility located in Building 751 with some modification or consolidated in Building 790 (**Figure 2**). Space would be available in Building 751, but this building does not have aircrew flight equipment or secured storage space. This would need to be added through minor renovations to the building to meet the proposed contract ADAIR mission requirements. Alternatively, JBLE-Langley could integrate contract ADAIR operations space requirements with the existing T-38 CAF ADAIR mission by providing operational space in Building 790. Aircraft Maintenance Unit activities are proposed to occur out of Building 751 (**Figure 2**). It would be expected that aircraft parking space would be available on the East Ramp adjacent to Building 751 (**Figure 3**). If contract ADAIR operational facilities were combined in Building 790 with the T-38 ADAIR pilot operational facilities, the Aircraft Maintenance Unit and hangar would still be located at Building 751.

CAF training activities utilize special use airspace proximate to JBLE-Langley. Special use airspace includes Warning Areas, which provide offshore airspace for military aircraft training and serve to warn nonparticipating aircraft of potential danger. The United States Navy manages and controls W-386, W-122, and W-72 proposed for ADAIR use. These Warning Areas overlie the Atlantic Ocean off the coast of Virginia, Maryland, and North Carolina (**Figure 4**). Time spent within the airspace (W-386, W-72, and W-122) would depend upon the specific training mission performed but would typically last 45 to 60 minutes. Contract ADAIR aircraft would employ chaff and flares (RR-188 chaff and M206 flares or similar) during 100 percent of their training sortie operations. Chaff and flares are the principal defensive countermeasures dispensed by military aircraft to avoid detection or attack by enemy air defense systems. Contractor operations would occur in these Warning Areas concurrent to the 1st Fighter Wing and 192nd Fighter Wing or other supported Air Force units. No airspace modifications would be required for contract ADAIR as part of the Proposed Action.

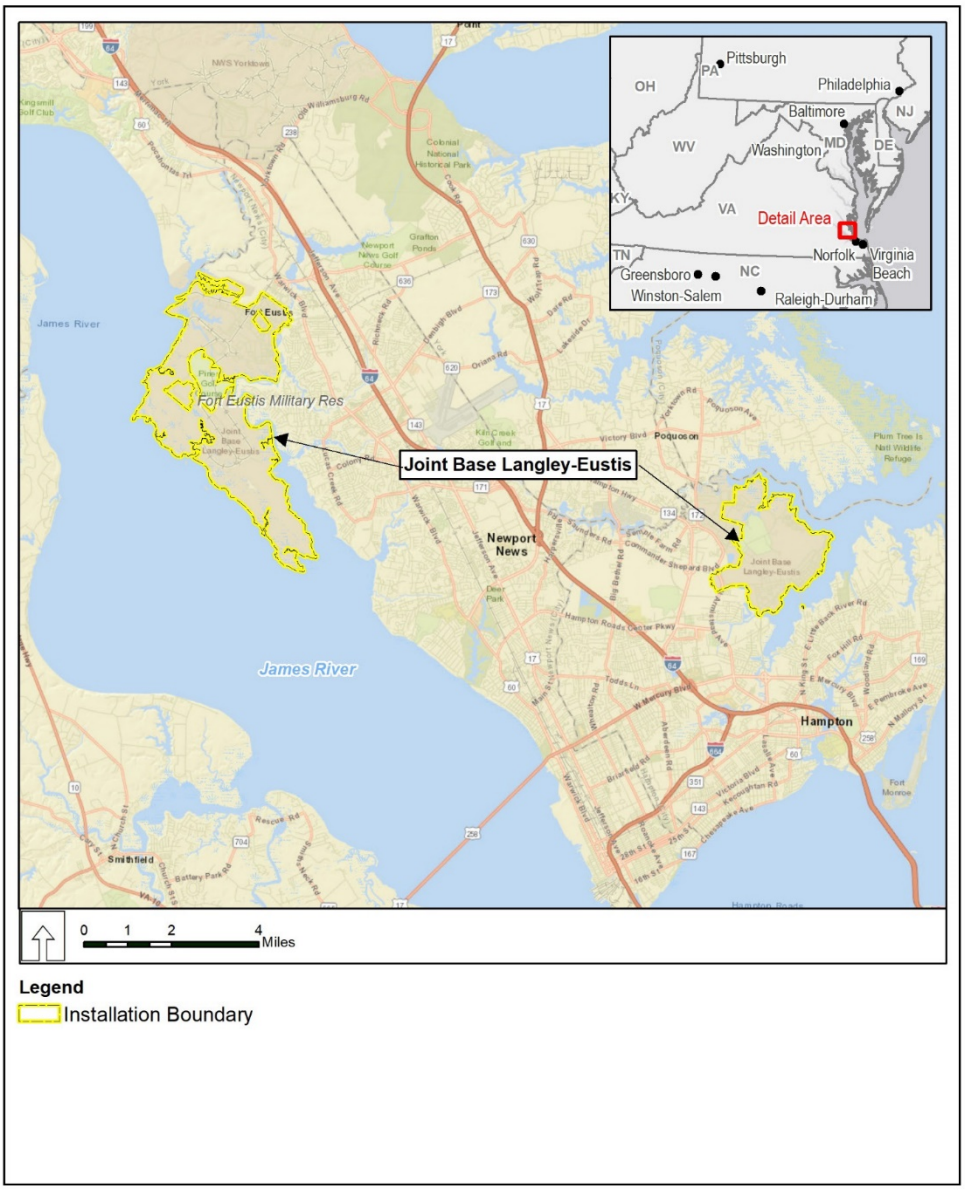


Figure 1. Location of Joint Base Langley-Eustis.



Figure 2. Proposed Location for Combined Aircraft Maintenance Unit, Operations, and Hangar Space at Buildings 751 and 790.

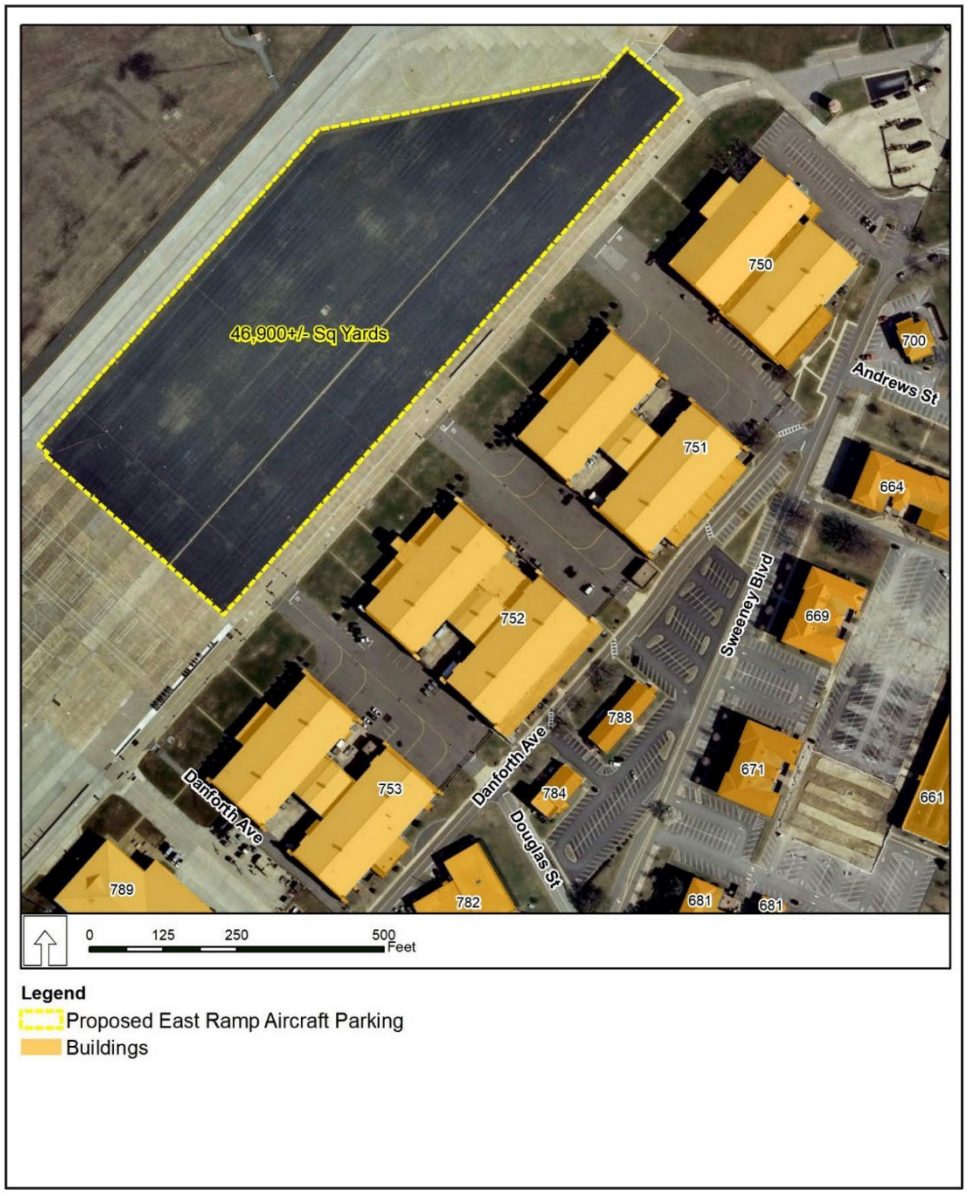


Figure 3. Proposed Location for Ramp Space for Contract Adversary Air Aircraft Parking.

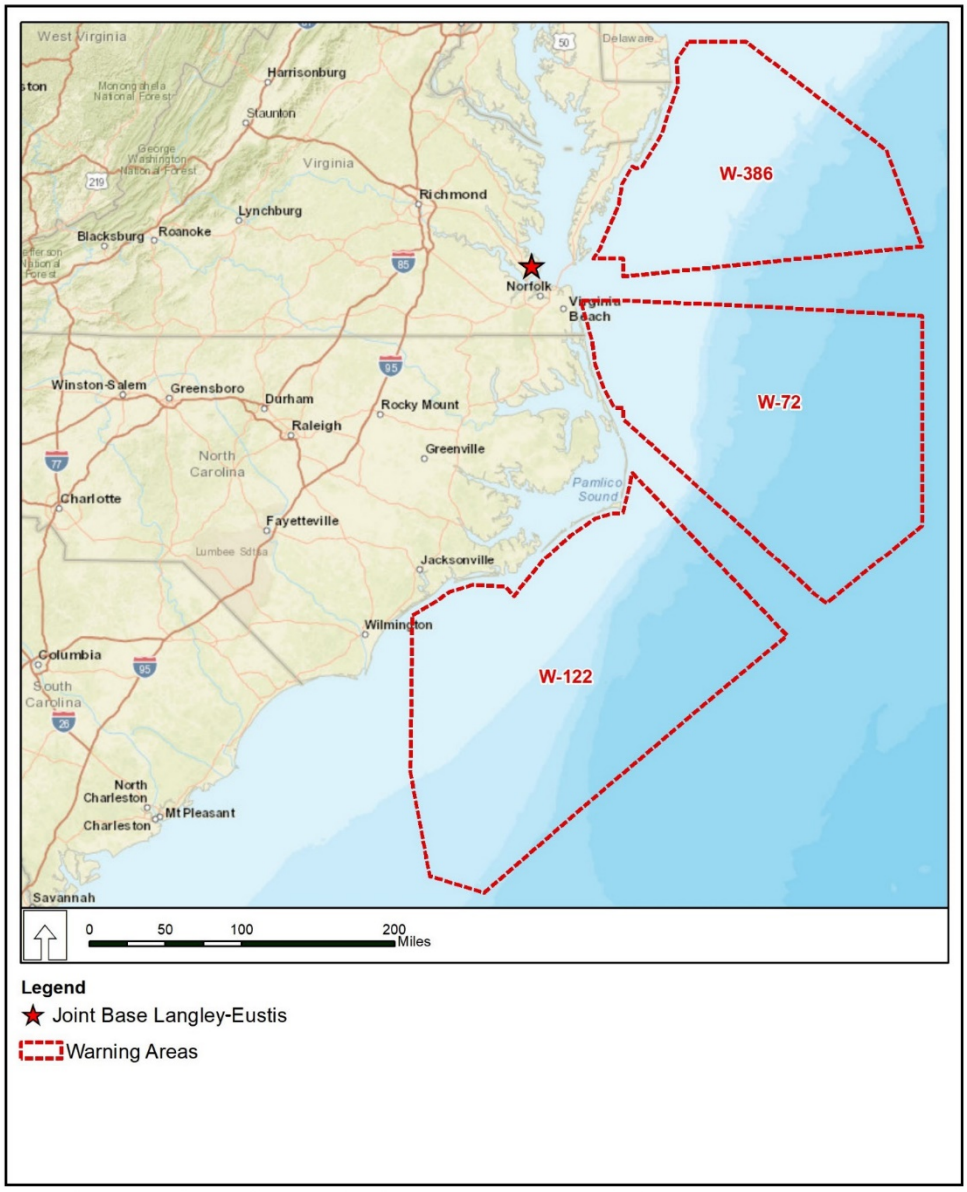


Figure 4. Warning Areas Proposed for Contract Adversary Air Sorties.

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Chief Bill Harris
Catawba Indian Nation
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Chief Gene Adkins
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Chief W. Frank Adams
Upper Mattaponi Indian Tribe
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King William, VA 23086

Chief G. Anne Richardson
Rappahannock Tribe Cultural Center
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Indian Neck, VA 23148

Chief Lee Lockamy
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Ms. Susan Bachor
Tribal Historic Preservation Representative
Delaware Tribe
PO Box 64
Pocono Lake, PA 18347

Ms. Kimberly Penrod
Director, Cultural Resources/106, Archives,
Library and Museum
Delaware Nation
31064 State Highway 281, PO Box 825
Anadarko, OK 73005

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Appendix A-2

United States Fish and Wildlife Service and National Marine Fisheries Service Consultation

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

JUN 0 7 2019

Lt Col Jeremy V. Oldham
Commander, 633d Civil Engineer Squadron
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Cindy Schulz
Field Supervisor
US Fish and Wildlife Service Ecological Services
6669 Short Lane
Gloucester VA 23061

Dear Ms. Schulz

The United States Air Force (Air Force) and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract Adversary Air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), located in Hampton, Virginia, to address shortfalls in combat readiness and provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. JBLE-Langley requests concurrence with a *may affect but not likely to adversely affect* determination for the federally listed Bermuda petrel and roseate tern and a *no effect* determination for red-cockaded woodpecker, piping plover, red knot, eastern black rail, northern long-eared bat, and northeastern beach tiger beetle per Section 7 of the Endangered Species Act regarding the proposal to provide contract ADAIR support at JBLE-Langley.

The Proposed Action is to provide dedicated contract ADAIR sorties at JBLE-Langley, Virginia, and would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 contractor aircraft to fly an estimated 4,100 annual sorties in support of the 1st Fighter Wing, 192nd Wing and other units at JBLE-Langley. Training activities would use special use airspace near JBLE-Langley that overlies the Atlantic Ocean (see attachment). JBLE-Langley has existing facilities available for use and may require minimal interior modification to be made ready for the contract ADAIR mission.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the United States Fish and Wildlife Service Information for Planning and Consultation Database as well as the JBLE-Langley Integrated Natural Resources Management Plan identified the federally listed species with the potential to occur at JBLE-Langley and in the Warning Areas. These are described in the attached Biological Evaluation.

There would be no ground-disturbing activities, and all potential impacts from the contract ADAIR training are associated with aircraft movement and the use of defensive countermeasures

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(i.e., chaff and flares) associated with ADAIR training in the Warning Areas over the Atlantic Ocean. Of the federally listed species that could potentially occur in the region, there is no suitable habitat for the red-cockaded woodpecker, eastern black rail, and piping plover at JBLE-Langley or near the airfield. Further, the northern long-eared bat has not been observed on JBLE-Langley during species-specific surveys, and no winter hibernacula or summer roosts have been recorded on base; therefore, these three species are not present in the action area and the contract ADAIR training would have no effect on these species. The northeastern beach tiger beetle would not be affected by aircraft movement or noise. As there would be no substantial change to the noise environment in the Warning Areas from contract ADAIR and the piping plover and red knot do not forage over the open ocean where defensive countermeasures would be used, there would be no effect on these species.

There are two federally listed birds potentially occurring in the Warning Areas with the potential to be affected by aircraft operations; these are further described in the attached Biological Evaluation:

- Bermuda petrel (*Pterodroma cahow*) – Endangered
- Roseate tern (*Sterna dougallii*) – Threatened

Determination of the Effects of the Proposed Action

Effects on avian species could occur from flight operations associated with contracted ADAIR training. These aircraft operations could affect biological resources from aircraft movement, noise, bird and animal aircraft strikes, and use of defensive countermeasures. For listed bird species, given the large area where training would occur and that most ADAIR training would occur during daytime hours while most birds migrate at night, the likelihood for the Bermuda petrel, red knot or roseate tern to encounter aircraft during training operations is extremely low.

There would be no direct effect from the use of defensive countermeasures chaff and flares as chaff and flares have been found to have low toxicity; chaff fibers are too large to be inhaled; and human health assessments have found the products from flare combustion to not have significant adverse effects, which is likely applicable to other species (Air Force, 1997). While birds may experience disorientation if they fly through a cloud of chaff, the effect would be short and the potential for injury is low due to the low mass and diffuse nature of the chaff, the short time that chaff is in the air, and the localized nature of the chaff release (Air Force, 1997); however, plastic caps and pistons from chaff and flares would be expended during their use and these small plastic components could fall to the ocean surface. Although the plastic chaff and flare caps and pistons would sink to the ocean floor, they could be visible to foraging birds on the ocean surface immediately after use during contract ADAIR training activities.

Given the small number of chaff and flares that would be used over the large expanses of the Atlantic Ocean in the Warning Areas, it is highly unlikely that birds such as the Bermuda petrel and roseate tern would ever encounter chaff and flare components while they were floating on the ocean surface. Residual plastic would sink in seawater and would only remain on the ocean surface for a short period of time and not be present on the surface or subsurface where the two species forage. Further, it is not known whether the Bermuda petrel or roseate tern would mistake plastic components as prey if they were encountered; however, if ingested, these small plastic components could cause gastrointestinal blockages if not regurgitated. The use of defensive countermeasures during contract

ADAIR training may therefore affect but is not likely to adversely affect the Bermuda petrel and roseate tern.

Please provide your written concurrence of the Air Force's determination to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley, Virginia 23665-2107 or by electronic mail to david.jennings.4@us.af.mil. Thank you in advance for your assistance.

JEREMY V. OLDHAM, Lt Col, USAF
Commander, 633d Civil Engineer Squadron

Reference:
Air Force. 1997. *Environmental Effects of Self-protection Chaff and Flares: Final Report*. Prepared for Headquarters Air Combat Command, Langley Air Force Base, Virginia.

Attachment:
Biological Evaluation

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

JUN 0 7 2019

Lt Col Jeremy V. Oldham
Commander, 633d Civil Engineer Squadron
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Mark Murray-Brown
Section 7 Coordinator
NMFS Protected Resources Division, Section 7 Program
55 Great Republic Drive
Gloucester MA 01930

Dear Mr. Murray-Brown

The United States Air Force (Air Force) and Headquarters Air Combat Command are proposing to provide Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), located in Hampton, Virginia, to address shortfalls in combat readiness and provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to high-end, advance combat training missions. JBLE-Langley requests concurrence with a *may affect but not likely to adversely affect* determination for listed cetaceans, Kemp's ridley turtle, green turtle, leatherback turtle, loggerhead turtle, and Atlantic sturgeon and a *no effect* determination for hawksbill turtle and shortnose sturgeon per Section 7 of the Endangered Species Act regarding the proposal to provide contract ADAIR support at JBLE-Langley.

The Proposed Action is to provide dedicated contract ADAIR sorties at JBLE-Langley, Virginia, and would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 contractor aircraft to fly an estimated 4,100 annual sorties in support of the 1st Fighter Wing, 192nd Wing and other units at JBLE-Langley. Training activities would use special use airspace near JBLE-Langley that overlies the Atlantic Ocean (see attachment). JBLE-Langley has existing facilities available for use and may require minimal interior modification to be made ready for the contract ADAIR mission.

Threatened, Endangered, and Candidate Species and Critical Habitat

A review of the National Marine Fisheries Listed Species Lists and Section 7 Mapper identified the federally listed species with the potential to occur near JBLE-Langley and in Warning Areas W-386, W-72 and W-122. These are described in the attached Biological Evaluation.

Of these species, only contract ADAIR operations in the Warning Areas have the potential to affect marine species. Because there would be no in-water activities from the contract ADAIR Proposed Action in the Warning Areas, the effects of the proposed activities on listed species are

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limited to aircraft overflights in the airspace where noise and visual cues could cause behavioral changes and the use of defensive countermeasures (i.e., chaff and flares) that would deposit small residual plastic components in the Atlantic Ocean; therefore, of the listed species potentially occurring in the project area, six federally listed cetaceans, five federally listed sea turtles, and two federally listed fish species could be impacted by the Proposed Action and are further described in the attached Biological Evaluation:

- North Atlantic right whale (*Eubalaena glacialis*) – Endangered
- Sperm whale (*Physeter macrocephalus*) – Endangered
- Blue whale (*Balaenoptera musculus*) – Endangered
- Sei whale (*Balaenoptera boreali*) – Endangered
- Fin whale (*Balaenoptera physalus*) – Endangered
- Humpback whale (*Megaptera novaengliae*) – Endangered
- Leatherback turtle (*Dermochelys coriacea*) – Endangered
- Green turtle (*Chelonia mydas*) – Threatened
- Kemp's ridley turtle (*Lepidochelys kempii*) – Endangered
- Hawksbill turtle (*Eretmochelys imbricata*) – Endangered
- Loggerhead turtle (*Caretta caretta*) – Threatened
- Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) – Endangered
- Shortnose sturgeon (*Acipenser brevirostrum*) – Endangered

Determination of the Effects of the Proposed Action

A total of 4,000 additional contract ADAIR sorties in the Warning Areas would occur annually under the Proposed Action. There would be no effect on the two listed sturgeon species from aircraft overflights as noise and aircraft movement would not impact fish species. The listed cetaceans and sea turtles could potentially be affected by aircraft overflights if the training activities elicited negative behavioral responses; however, aircraft movement would not be visible to cetaceans and sea turtles unless an individual was at the exact location at the moment in which an aircraft traveling at high speed at a relatively low altitude passed directly overhead. Although contract ADAIR aircraft would be permitted to fly at low altitudes during training activities in the Warning Areas, the majority of the ADAIR sorties would occur at higher altitudes; therefore, the occurrences where aircraft movement would be visible to cetaceans and sea turtles would be so rare as to be negligible and may not even generate a startle response if an interaction occurred. Aircraft noise in the Warning Areas would have no effect on cetaceans or sea turtles as there would be no substantial change in the noise environment from contract ADAIR. Sonic booms from supersonic aircraft movement could cause a startle response by the listed species; however, sonic booms would be relatively rare events during ADAIR training, and the sonic boom and post-boom rumbling would be similar to what cetaceans and sea turtles experience on the ocean surface during a thunderstorm; therefore, sonic booms from supersonic aircraft movement would have no effect on listed species.

The components of chaff and flares have been found to have low toxicity; chaff fibers are too large to be inhaled; and human health assessments have found the products from flare combustion to not have significant adverse effects, which is likely applicable to other species (Air Force, 1997); however, the use of chaff and flares in the Warning Areas would produce small amounts of ingestible material, such as plastic caps and pistons, and these could fall to the ocean surface. Although the Warning Areas are large in size, a relatively small number of chaff and flares are proposed for use

annually during contract ADAIR training and residual plastic chaff and flare components would sink from the ocean surface to the ocean floor, so some of these materials could be consumed by cetaceans, sea turtles and sturgeons if these species were present in the Warning Areas when defensive countermeasures were being used. The use of defensive countermeasures during contract ADAIR training may affect, but is not likely to adversely affect listed cetaceans, Kemp's ridley turtle, green turtle, leatherback turtle, loggerhead turtle, and Atlantic sturgeon. The use of defensive countermeasures would have no effect on the hawksbill turtle or shortnose sturgeon as they would not be present in the Warning Areas where defensive countermeasures are proposed to be used; therefore, there is no potential for these species to interact with plastic chaff and flare components.

Please provide your written concurrence of the Air Force's determinations on cetaceans, sea turtles and sturgeon species to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley, Virginia 23665-2107 or by electronic mail to david.jennings.4@us.af.mil. Thank you in advance for your assistance.

JEREMY V. OLDHAM, Lt Col, USAF
Commander, 633d Civil Engineer Squadron

Reference:
Air Force. 1997. *Environmental Effects of Self-protection Chaff and Flares: Final Report*. Prepared for Headquarters Air Combat Command, Langley Air Force Base, Virginia.

Attachment:
Biological Evaluation

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Date: August 1, 2019

Self-Certification Letter

Project Name: Combat Air Forces Adversary Air at Joint Base Langley-Eustis

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

The species conclusions table in the enclosed project review package summarizes your ESA conclusions. These conclusions resulted in:

- "no effect" determinations for proposed/listed species and/or proposed/designated critical habitat; and/or
- Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR § 17.40(o) [as determined through the Information, Planning, and Consultation System (IPaC) northern long-eared bat assisted determination key]; and/or
- "may affect, not likely to adversely affect" determinations for proposed/listed species and/or proposed/designated critical habitat.

VERSION 3.0

Applicant Page 2

We certify that use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package results in reaching the appropriate determinations. Therefore, we concur with the "no effect" or "may affect, not likely to adversely affect" determinations for proposed and listed species and proposed and designated critical habitat. Additional coordination with this office is not needed.

Candidate species are not legally protected pursuant to the ESA. However, the Service encourages consideration of these species by avoiding adverse impacts to them. Please contact this office for additional coordination if your project action area contains candidate species.

Should project plans change or if additional information on the distribution of proposed or listed species, proposed or designated critical habitat becomes available, this determination may be reconsidered. This certification letter is valid for 1 year.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available at our website http://www.fws.gov/northeast/virginiafield/endspecies/project reviews.html. If you have any questions, please contact Troy Andersen of this office [redacted]

Sincerely,

Cindy Schulz
Field Supervisor
Virginia Ecological Services

Enclosures - project review package

VERSION 3.0

Species Conclusions Table

Project Name: Combat Air Forces Adversary Air at Joint Base Langley-Eustis

Date: August 1, 2019

Species / Resource Name	Conclusion	ESA Section 7	Notes / Documentation
Northern long-eared bat (Myotis septentrionalis)	No suitable habitat present	No effect	Formal acoustic surveys conducted in 2017 (attached) did not document the species, no summer roosts or winter hibernacula present within the Action Area. No maternity roots within or near the Action Area (VDGF). Species not present.
Piping plover (Charadrius melodus)	No suitable habitat present	No effect	No suitable breeding or foraging habitat exists on Langley AFB for the piping plover.
Northeastern Beach Tiger Beetle (Cicindela dorsalis dorsalis)	No suitable habitat present	No effect	The southern periphery of the tiger beetle's range is located north of Langley AFB, species not present in the action area.
Critical Habitat	No critical habitat present	No effect	

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: August 01, 2019
Consultation Code: 05E2VA00-2019-SLI-5607
Event Code: 05E2VA00-2019-E-13825
Project Name: Combat Air Forces Adversary Air at Joint Base Langley-Eustis

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

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

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

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

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

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

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

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

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

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

Attachment(s):

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

Official Species List

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

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2019-SLI-5607

Event Code: 05E2VA00-2019-E-13825

Project Name: Combat Air Forces Adversary Air at Joint Base Langley-Eustis

Project Type: MILITARY OPERATIONS / MANEUVERS

Project Description: To provide dedicated contract adversary air sorties for Combat Air Forces training at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley). The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 aircraft. Approximately 4,000 contracted sorties would be added to perform training activities in offshore training areas. The proposed facilities at JBLE-Langley would include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; runway access; and associated parking to support the Proposed Action.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.081909220937675N76.367145511069W



Counties: Hampton, VA | Newport News, VA | Poquoson, VA | York, VA

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos fws.gov/ecp/species/6039	Threatened

Insects

NAME	STATUS
Northeastern Beach Tiger Beetle *Cicindela dorsalis dorsalis* No critical habitat has been designated for this species. Species profile: https://ecos fws.gov/ecp/species/8105	Threatened

Critical habitats

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

USFWS National Wildlife Refuge Lands And Fish Hatcheries

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

The following FWS National Wildlife Refuge Lands and Fish Hatcheries lie fully or partially within your project area:

FACILITY NAME	ACRES
Plum Tree Island National Wildlife Refuge	3,060

Plum Tree Island National Wildlife Refuge
C/o Eastern Virginia Rivers Nwr, Southern Division
11116 Kimages Road
Charles City, VA 23030-2844
(804) 829-9020

https://www fws.gov/refuges/profiles/index.cfm?id=51512

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG 2 3 2019

Brenda W. Cook
633 CES/CD
37 Sweeney Blvd.
JBLE-Langley, VA 23665-2107

Re: Adversary Air Support

Dear Ms. Cook:

We have completed our consultation under section 7 of the Endangered Species Act (ESA) in response to your letter and Biological Evaluation received on August 9, 2019, regarding the above-referenced proposed project. We reviewed your consultation request document and related materials. Based on our knowledge and your materials, we concur with your conclusion that the proposed action is not likely to adversely affect any ESA-listed species under our jurisdiction.

We would like to offer the following clarification to complement your incoming request for consultation. In your analysis of impacts from chaff and flare components in the water column, we would like to clarify that because the action area is in a coastal environment where listed species are able to disperse widely, the risk of ingestion is extremely unlikely and therefore, any effects on listed species are discountable. Furthermore, any changes to habitat are analyzed within the boundaries of the action area rather than surrounding waters. In this case, any negative impacts to the aquatic habitat would be very small and dispersed over a wide area. While ESA-listed whales (North Atlantic right, blue, sei, fin, and sperm), sea turtles (green, leatherback, loggerhead, and Kemp's ridley) and Atlantic sturgeon may forage in the action area, any minor effects to their foraging behavior and fitness are too small to be meaningfully measured or detected, and are insignificant. These clarifications do not alter your analysis or conclusion and thus no further consultation pursuant to section 7 of the ESA is required.

Reintiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation or; (c) If a new species is listed or critical habitat designated that may be affected by the identified action. No take is anticipated or exempted. Should you have any questions about this correspondence please contact Brian Hopper at [redacted] or [redacted] For questions related to Essential Fish Habitat please contact David O'Brien, with our Habitat Conservation Division at [redacted] or [redacted]

Sincerely,

Jennifer Anderson
Acting Assistant Regional Administrator
for Protected Resources

EC: O'Brien, F/NER 4
ECO: GARFO-2019-02255
File Code: H:\Section 7 Team\Section 7\Non-Fisheries\DOD\Air Force\Informal\Joint Base Langley-Eustis Air Combat Training

2

Appendix A-3

Draft Environmental Assessment Distribution Letters

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Marc Holma
VA Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Mr. Holma

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

The Proposed Action would use existing facilities at JBLE-Langley. The existing facilities would include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; and runway access to support the Proposed Action. Two alternatives and the No Action Alternative for the proposed contract ADAIR were evaluated in the EA. These alternatives represent various options for facility use at JBLE-Langley. Under Alternative 1, contract ADAIR operations and maintenance activities and aircrew briefings would be consolidated in Building 751. Under Alternative 2, contract ADAIR operations would be combined with the T-38 ADAIR mission in Building 790, while maintenance and hangar space would be collocated in Building 751. No action for this EA reflects the status quo where no contract ADAIR support at JBLE-Langley would occur.

Executive Order 12372, *Intergovernmental Review of Federal Programs*, requires federal agencies to solicit federal agency as well as state and local government participation in the NEPA process. Accordingly, I am requesting your participation in the review and comment process. Copies

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of the Draft EA and the proposed FONSI are available at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/. Please provide comments on the Draft EA and Proposed FONSI within 30 days of receipt of this letter to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil.

Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Cindy Schulz, Field Supervisor
Ecological Services
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061

Dear Ms. Schulz

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

The Proposed Action would use existing facilities at JBLE-Langley. The existing facilities would include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; and runway access to support the Proposed Action. Two alternatives and the No Action Alternative for the proposed contract ADAIR were evaluated in the EA. These alternatives represent various options for facility use at JBLE-Langley. Under Alternative 1, contract ADAIR operations and maintenance activities and aircrew briefings would be consolidated in Building 751. Under Alternative 2, contract ADAIR operations would be combined with the T-38 ADAIR mission in Building 790, while maintenance and hangar space would be collocated in Building 751. No action for this EA reflects the status quo where no contract ADAIR support at JBLE-Langley would occur.

Executive Order 12372, *Intergovernmental Review of Federal Programs*, requires federal agencies to solicit federal agency as well as state and local government participation in the NEPA process. Accordingly, I am requesting your participation in the review and comment process. Copies

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of the Draft EA and the proposed FONSI are available at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/. Please provide comments on the Draft EA and Proposed FONSI within 30 days of receipt of this letter to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil.

Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Sarah Nystrom
USFWS Virginia Field Office
Ecological Services
6669 Short Lane
Gloucester, VA 23061

Dear Ms. Nystrom

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Executive Order 12372, *Intergovernmental Review of Federal Programs*, requires federal agencies to solicit federal agency as well as state and local government participation in the NEPA process. Accordingly, I am requesting your participation in the review and comment process. Copies

Global Power For America

of the Draft EA and the proposed FONSI are available at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/. Please provide comments on the Draft EA and Proposed FONSI within 30 days of receipt of this letter to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil.

Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Bill Harris
Catawba Indian Nation
996 Avenue of the Nations
Rock Hill SC 29730

Dear Chief Harris

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Catawba Indian Nation to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Catawba Indian Nation has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Ms. Wenonah G. Haire wo/Encl
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Stephen Adkins
Chickahominy Indian Tribe
7240 Adkins Road
Charles City VA 23030

Dear Chief Adkins

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Chickahominy Indian Tribe to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Chickahominy Indian Tribe has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

President Deborah Dotson
Delaware Nation
PO Box 825
Andarko OK 73005

Dear President Dotson

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Delaware Nation to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Delaware Nation has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Ms. Kimberly Penrod wo/Encl
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Chester "Chet" Brooks
Delaware Tribe
5100 Tuxedo Blvd.
Bartlesville OK 74006

Dear Chief Brooks

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. Now, I would like to follow up by inviting the Delaware Tribe to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Delaware Tribe has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander

Enclosure:
Draft Environmental Assessment

cc:
Ms. Susan Bachor wo/Encl
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Gene Adkins
Eastern Chickahominy Tribe
3120 Mt. Pleasant Road
Providence Forge VA 23140

Dear Chief Adkins

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Eastern Chickahominy Tribe to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Eastern Chickahominy Tribe has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Dean Branham
Monacan Nation
PO Box 960
Amherst VA 24521

Dear Chief Branham

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Monacan Tribe to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Monacan Nation has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Lee Lockamy
Nansemond Indian Tribal Association
5005 Mosby Road
Virginia Beach VA 23455

Dear Chief Lockamy

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. Now, I would like to follow up by inviting the Nansemond Indian Tribal Association to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Nansemond Indian Tribal Association has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief Robert Gray
Pamunkey Indian Tribe
191 Lay Landing Road
King William VA 23086

Dear Chief Gray

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Pamunkey Indian Tribe to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Pamunkey Indian Tribe has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Dr. Ashley Atkins-Spivey wo/Encl
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief G. Anne Richardson
Rappahannock Tribe Cultural Center
5036 Indian Neck Road
Indian Neck VA 23148

Dear Chief Richardson

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Rappahannock Tribe Cultural Center to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Rappahannock Tribe has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

12 Jul 19

Colonel Clinton A. Ross
Commander, 633d Air Base Wing
125 Mabry Avenue
Joint Base Langley-Eustis VA 23665

Chief W. Frank Adams
Upper Mattaponi Indian Tribe
5932 East River Road
King William VA 23086

Dear Chief Adams

Last summer my predecessor, Colonel Sean Tyler, sent you a letter briefly describing the Air Force's proposal to establish an "adversary air" (ADAIR) operation at Joint Base Langley Eustis, Langley Air Force Base (JBLE-Langley) Virginia. I hope you or your staff have had the opportunity to review the Description of Proposed Action and Alternatives (DOPAA) summary that he provided. I would like to follow up by inviting the Upper Mattaponi Indian Tribe to engage in government-to-government consultation with JBLE-Langley on the proposal.

The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be added to perform training activities within the airspace near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Aircraft servicing will be performed at Langley AFB in Hangars 751 and 790. While Hangar 751 is eligible for inclusion in the National Register of Historic Places (NRHP) as a contributing element of the Langley Field Historic District, only minimal interior modifications are necessary. Hanger 790 is not a historic building. Training activities in the special use air space within the Military Operations Area that overlies the Atlantic Ocean would be performed at an altitude that would not affect potential underwater resources.

I understand that, to date, the Upper Mattaponi Indian Tribe has not informed JBLE-Langley of any properties of religious and cultural significance at JBLE-Langley. We now invite you to consult and identify any such properties on the airfield or associated with the airspace that might be affected by the Proposed Action. Please let us know if any of these properties are present, along with any supporting information you can share on their religious and cultural significance. To ensure that we can make full use of any information you provide, it would be helpful to hear back from you within 30 days of receipt of this letter. I have designated Mr. D. Keith Morrow, our Installation Tribal Liaison Officer, as my principal point of contact on this consultation. He can be reached at email david.k.morrow.civ@mail.mil or phone 757-878-2908. Thank you in advance for your consideration.

Sincerely

CLINTON A. ROSS, Colonel, USAF
Commander, 633d Air Base Wing

Enclosure:
Draft Environmental Assessment

cc:
Virginia Department of Historic Resources wo/Encl

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Dr. Ashley Atkins-Spivey
Tribal Historic Preservation Officer
Pamunkey Indian Reservation
191 Lay Landing Road
King William, VA 23086

Dear Dr. Atkins-Spivey

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Kimberly Penrod
Director, Cultural Resources/106, Archives, Library and Museum
Delaware Nation
31064 State Highway 281, PO Box 825
Anadarko, OK 73005

Dear Ms. Penrod

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

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Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Susan Bachor
Tribal Historic Preservation Representative
Delaware Tribe
PO Box 64
Pocono Lake, PA 18347

Dear Ms. Bachor

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Wenonah G. Haire
Tribal Historic Preservation Officer
Catawba Cultural Preservation Project
1536 Tom Steven Road
Rock Hill, SC 29730

Dear Ms. Haire

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mayor Donnie Tuck
City of Hampton, Virginia
8th Floor, City Hall
22 Lincoln Street
Hampton VA 23669

Dear Mayor Tuck

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Neil Morgan
York County Administrator
PO Box 532
Yorktown, VA 23690-0532

Dear Mr. Morgan

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Everett Skipper, PE, BCEE
Director of Engineering
Department of Engineering
2400 Washington Ave
Newport News, VA 23607

Dear Mr. Skipper

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Christopher DeHart
Environmental Services Manager
419 North Armistead Avenue
Hampton, VA 23669

Dear Mr. DeHart

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Gene Crabtree
USDA-NRCS
203 Wimbledon Lane
Smithfield, VA 23430

Dear Mr. Crabtree

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Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Nora Theodore
Office of Environmental Programs
US EPA, Region III
1650 Arch Street (3EA30)
Philadelphia, PA 19103

Dear Ms. Theodore

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Dave O'Brien
Habitat Conservation Division, NOAA
PO Box 1346
7580 Spencer Road
Gloucester Point, VA 23062

Dear Mr. O'Brien

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Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Bettina Sullivan
VA Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street
Richmond, VA 23219

Dear Ms. Sullivan

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Bert Parolari
VA Department of Environmental Quality-TRO
5636 Southern Boulevard
Virginia Beach, VA 23462

Dear Mr. Parolari

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Raymond T. Fernald
Environmental Services Section
VA Department of Game & Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

Dear Mr. Fernald

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Dr. Karen Remley
VA Department of Health
PO Box 2448
Richmond, VA 23218

Dear Dr. Remley

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Tony Watkinson
Habitat Management Division
VA Marine Resources Commission
Building 96
380 Fenwick Road
Ft. Monroe, VA 23651

Dear Mr. Watkinson

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Robbie Rhur
Department of Conservation and Recreation
600 East Main Street
Richmond, VA 23219

Dear Ms. Rhur

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Janet Weyland
VA Department of Environmental Quality-TRO
5636 Southern Boulevard
Virginia Beach, VA 23462

Dear Ms. Weyland

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Amy M. Ewing
Environmental Services Section
VA Department of Game & Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

Dear Ms. Ewing

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Roy Soto
VA Department of Health
PO Box 2448
Richmond, VA 23218

Dear Mr. Soto

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Tom Ballou
Air Data Analysis Program
629 East Main Street, 8th Floor
Richmond, VA 23219

Dear Mr. Ballou

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Dave Davis
Wetlands & Water Protection Program
629 East Main Street, 9th Floor
Richmond, VA 23219

Dear Mr. Davis

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Dan Burnstein
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

Dear Mr. Burnstein

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Kelley Harris West
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060-6295

Dear Ms. West

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Joan Salvati
DEQ Office of Stormwater Management
629 East Main Street
Richmond, VA 23219

Dear Ms. Salvati

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Keith Tignor
Office of Plant & Pest Services
1100 Bank Street
Richmond, VA 23219

Dear Mr. Tignor

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. R. N. (Rusty) Harrington, Manager
Planning & Environmental Section
Department of Aviation
5702 Gulfstream Road
Richmond, VA 23250-2422

Dear Mr. Harrington

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Buck Kline, Director
Forestland Conservation Division
Virginia Department of Forestry
900 Natural Resources Drive, Suite 800
Charlottesville, VA 22903

Dear Mr. Kline

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. J. Randall Wheeler
City Manager
500 City Hall Avenue
Poquoson, VA 23662

Dear Mr. Wheeler

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Ms. Julie Crocker
Acting Assistant Regional Administrator
NMFS Protected Resources Division, Greater Atlantic Regional Office
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Crocker

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. David Bernhart
Assistant Regional Administrator
NMFS Protected Resources Division, Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

Dear Mr. Bernhart

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mr. Andrew Griffey
Hampton Wetland Board
22 Lincoln Street
Hampton, VA 23669

Dear Mr. Griffey

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mayor W. Eugene Hunt, Jr.
City of Poquoson, Virginia
500 City Hall Avenue
Poquoson VA 23662

Dear Mayor Hunt

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

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Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Mayor McKinley L. Price
City of Newport News, Virginia
2400 Washington Ave
Newport News VA 23607

Dear Mayor Price

The United States Air Force (Air Force) has prepared a Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) Virginia. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations. The Proposed Action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contractor aircraft performing training activities within the airspace (Warning Areas W-386, W-72, and W-122) near JBLE-Langley that overlie the Atlantic Ocean off the coast of Maryland, Virginia, and North Carolina. Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

The Proposed Action would use existing facilities at JBLE-Langley. The existing facilities would include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; and runway access to support the Proposed Action. Two alternatives and the No Action Alternative for the proposed contract ADAIR were evaluated in the EA. These alternatives represent various options for facility use at JBLE-Langley. Under Alternative 1, contract ADAIR operations and maintenance activities and aircrew briefings would be consolidated in Building 751. Under Alternative 2, contract ADAIR operations would be combined with the T-38 ADAIR mission in Building 790, while maintenance and hangar space would be collocated in Building 751. No action for this EA reflects the status quo where no contract ADAIR support at JBLE-Langley would occur.

Executive Order 12372, Intergovernmental Review of Federal Programs, requires federal agencies to solicit federal agency as well as state and local government participation in the NEPA process. Accordingly, I am requesting your participation in the review and comment process. Copies

Global Power For America

of the Draft EA and the proposed FONSI are available at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/. Please provide comments on the Draft EA and Proposed FONSI within 30 days of receipt of this letter to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil.

Sincerely,

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Director
Bateman Library
42 Ash Avenue, Building 161
JBLE-Langley VA 23665

Dear Sir or Madam

Please find enclosed a copy of the Draft Environmental Assessment evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) Virginia. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations, the Air Force Civil Engineer Center and JBLE-Langley request that libraries file this document for public access and reference.

Please maintain this document for public access for 35 days from receipt of this letter. Written responses may be sent to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil. Thank you in advance for your assistance.

Sincerely

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
Draft Environmental Assessment

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Director
Hampton Library
4207 Victoria Boulevard
Hampton VA 23669

Dear Sir or Madam

Please find enclosed a copy of the Draft Environmental Assessment evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) Virginia. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations, the Air Force Civil Engineer Center and JBLE-Langley request that libraries file this document for public access and reference.

Please maintain this document for public access for 35 days from receipt of this letter. Written responses may be sent to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil. Thank you in advance for your assistance.

Sincerely

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
Draft Environmental Assessment

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
LANGLEY AIR FORCE BASE VA

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Director
Poquoson Library
500 City Hall Avenue
Poquoson VA 23662

Dear Sir or Madam

Please find enclosed a copy of the Draft Environmental Assessment evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) Virginia. In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations implementing NEPA, and the Air Force NEPA regulations, the Air Force Civil Engineer Center and JBLE-Langley request that libraries file this document for public access and reference.

Please maintain this document for public access for 35 days from receipt of this letter. Written responses may be sent to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil. Thank you in advance for your assistance.

Sincerely

Brenda W. Cook

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
Draft Environmental Assessment

Global Power For America

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Appendix A-4

Draft Environmental Assessment Notice of Availability

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DAILY PRESS MEDIA GROUP

COMMONWEALTH OF VIRGINIA
CITY OF NEWPORT NEWS

6364396

This day, personally appeared before me, George Hunt, and made oath as follows:

1. He/She is employed in the Office Services Department of the Daily Press, LLC., a newspaper publishing company in the City of Newport News, Virginia.
2. The annexed advertisement of Order No. 6364396 was published for 1 insertion(s) in the Daily Press on the following dates:

Jul 14, 2019

Sold To:
VERNADERO GROUP INCORPORATED - CU80055195
3400 S Carrollton Ave
Unit 850752
New Orleans,LA 70185

Bill To:
VERNADERO GROUP INCORPORATED - CU80055195
3400 S Carrollton Ave
Unit 850752
New Orleans,LA 70185

George Hunt

George Hunt

7/15/2019
Date

Subscribed and sworn to before me:

This 15 day of July 20 19,

My commission expires: 03/31/2023

NATASHA RENEE BRASWELL
NOTARY PUBLIC
REG. #7821879
MY COMMISSION EXPIRES
COMMONWEALTH OF VIRGINIA

Natasha Renee Braswell

Signature of Notary Public

Registration Number: 7821879

DAILY PRESS MEDIA GROUP

NOTICE OF AVAILABILITY
Draft Environmental Assessment for Combat Air Forces Adversary Air at Joint Base Langley-Eustis, Langley Air Force Base, Virginia

A Draft Environmental Assessment (EA) and proposed Finding of No Significant Impact (FONSI) have been prepared by the United States Air Force to analyze the impacts of providing dedicated contract adversary air (ADAIR) sorties for Combat Air Forces training at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia.

The Proposed Action includes the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 contractor aircraft to fly an estimated 4,000 annual sorties in special use airspace off the coasts of Virginia, Maryland, and North Carolina, and in support of the 1st Fighter Wing, 192d Fighter Wing, and other units at JBLE-Langley. JBLE-Langley has existing facilities to support the Proposed Action that are available for use and require minimal modification. They are located around the existing airfield and runway and include the necessary ramp space; maintenance space; operational space; petroleum, oil, and lubricants storage; runway access; and associated parking to support the contract ADAIR mission.

The Draft EA and proposed FONSI are available at the following locations:

- Bateman Library (Building 161), 42 Ash Avenue, JBLE-Langley, Virginia 23665
- Hampton Library, 4207 Victoria Boulevard, Hampton, Virginia 23669
- Poquoson Library, 500 City Hall Avenue, Poquoson, Virginia 23662

An electronic copy of the Draft EA and proposed FONSI can also be found on the JBLE-Langley Website at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/. Please provide any comments within 30 days from the date of this Notice of Availability. Comments should be mailed to Mr. David Jennings at 37 Sweeney Blvd, JBLE-Langley, VA 23665-2107 or by electronic mail to 633CES.CEIE.NEPAPublicComment@us.af.mil.

PRIVACY ADVISORY NOTICE

This Draft EA and proposed FONSI are provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality NEPA Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and 32 CFR Part 989, Environmental Impact Analysis Process (EIAP). The EIAP provides an opportunity for public input on Air Force decision-making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.
6364396 7/14/2019

6364396

Appendix A-5

Agency and Government-to-Government Comment Letters

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COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Matthew J. Strickler
Secretary of Natural Resources

Steven G. Bowman
Commissioner

July 19, 2019

Mr. David Jennings
37 Sweeney Blvd
JBLE-Langley VA 23665-2107

Re: Environmental Assessment
Combat Air Forces Contract Adversary Air Support

Dear Mr. Jennings

This will respond to the request for comments regarding the Environmental Assessment for the Combat Air Forces Contract Adversary Air Support project, prepared by the United States Air Force. Specifically, the Air Force has proposed to provide air sortie training to contracted maintainers and pilots which may result in small plastic components landing on the surface of the Atlantic Ocean.

Please be advised that the Virginia Marine Resources Commission (VMRC) pursuant to Chapter 12, 13, & 14 of Title 28.2 of the Code of Virginia administers permits required for encroachments in, on or over State-owned submerged lands and impacts to tidal wetlands, beaches and dunes. The Commonwealth's jurisdictional submerged lands extend into the Atlantic Ocean offshore to a distance of 3 nautical miles as measured from the mean low water shoreline (Virginia's Territorial Sea). Since no direct impacts are proposed within tidal wetlands, beaches or dunes and there will be no proposed encroachment of submerged lands, please be advised that a permit will not be required from this office.

VMRC does, however, additionally administer the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches which comprise some of Virginia's Coastal Zone Management Program. The following additional comments are offered:

Fisheries and Shellfish: The resulting loss of residual plastic components into the Atlantic Ocean represents a potential hazard to marine resources and should be properly managed to reduce or eliminate risks to these species

State-owned Submerged Lands: The resulting loss of residual plastic components into the Atlantic Ocean represents a potential hazard to marine resources and should be properly managed to reduce or eliminate risks to these species

State-owned Tidal Wetlands: None in close proximity to the project area

Beaches and Coastal Primary Sand Dunes: None in close proximity to the project area

As proposed, we have no objection to the consistency findings provided by the applicant but reiterate

An Agency of the Natural Resources Secretariat
www.mrc.virginia.gov
Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

Mr. David Jennings
July 19, 2019
Page Two

our caution about marine plastics. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

If you have any questions please contact me at [redacted] or by email at [redacted] Thank you for the opportunity to comment.

Sincerely,

Allison Lay

Allison Lay
Environmental Engineer, Habitat Management

AEL/keb
HM

Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791

July 31, 2019

Attention: David Jennings
Department of the Air Force
37 Sweeney Boulevard
JBLE-Langley, VA 23665-2107

Re. THPO #	TCNS #	Project Description
2019-702-3		Proposed Combat Air Forces contract ADAIR support at JBL-E, VA

Dear Mr. Jennings,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Rogers at [redacted] or e-mail [redacted]

Sincerely,

Caitlin Rogers for

Wenonah G. Haire
Tribal Historic Preservation Officer

COUNTY ADMINISTRATOR
Neil A. Morgan

York County
VIRGINIA
America's Future Since 1781

BOARD OF SUPERVISORS
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District 1
Sheila S. Noll
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W. Chad Green
District 3
Jeffrey D. Wassmer
District 4
Thomas G. Shepperd, Jr.
District 5

August 2, 2019

Mr. David Jennings
37 Sweeney Boulevard
Joint Base Langley-Eustis
Langley Air Force Base, Virginia 23665-2107

Dear Mr. Jennings:

I am writing in response to an undated letter from Ms. Brenda Cook, which we received July 11, 2019, requesting York County's comments on the Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) evaluating the potential environmental impacts associated with the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base. We have reviewed the document; and based on that review, we offer the following comments.

It appears there could be some potentially significant noise impacts as a result of the proposed action; however, the noise contour maps indicate that no portion of York County lies within the heavily affected area. Moreover, the proposed mitigation measures appear adequate to reduce potential noise at the affected points of interest to acceptable levels.

The document states, "There is *[sic]* adequate available housing and public schools to support the minor increase in population from the Proposed Action; therefore, there would be no impact on the region's population, housing, or schools from implementation of the Proposed Action, and these resources are not carried forward for more detailed analysis in this EA." While we believe the impacts on York County schools are manageable, especially since no new housing construction is proposed, we believe there could be some impact, especially since two of the County's four elementary schools in the vicinity of Langley AFB are near capacity. Since these school impacts would be minor, we agree that there is no need for more detailed analysis.

In summary, we concur with the Proposed Finding of No Significant Impact, and the County supports the proposed action. We have a heavy military presence on the Virginia Peninsula and are accustomed to dealing with the impacts of military bases. With that, and with the Base's long history of working collaboratively with the surrounding communities in a spirit of mutual cooperation, we are confident that the proposed contract ADAIR will raise no significant compatibility issues.

Sincerely,

Neil A. Morgan
County Administrator

TCC

224 Ballard Street • P.O. Box 532 • Yorktown, Virginia 23690-0532 • (757) 890-3320
Fax: (757) 890-4002 •TDD (757) 890-3621 • Email: bos@yorkcounty.gov
A Hampton Roads Community

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 1111 East Main Street, Suite 1400, Richmond, VA 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Matthew J Strickler
Secretary of Natural Resources

David K Paylor
Director

(804) 698-4000
1-800-592-5482

August 6, 2019

Mr. David Jennings
Joint Base Langley-Eustis
Langley Air Force Base
37 Sweeney Boulevard
JBLE-Langley, Virginia 23665-2107

RE: U.S. Department of the Air Force Environmental Assessment: Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis, Langley Air Force Base (DEQ 19-097F).

Dear Mr. Jennings:

The Commonwealth of Virginia has completed its review of the draft environmental assessment (EA) for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. The following agencies and locality joined in this review:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Historic Resources
Marine Resources Commission
York County

The Department of Game and Inland Fisheries, Hampton Roads Regional Commission, City of Hampton and the Department of Aviation also were invited to comment.

PROJECT DESCRIPTION

The U.S. Air Force developed an environmental assessment (EA) to address the potential environmental consequences associated with providing contract adversary air

(ADAIR) sorties for improving training and readiness of pilots at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. The elements affecting JBLE-Langley include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the airspace include airspace use and defensive countermeasures. The Proposed Action at JBLE-Langley would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 aircraft. No ground disturbance would take place as part of the proposed action.

NEPA CONCLUSION

Provided activities are performed in accordance with the recommendations which follow in the Environmental Impacts and Mitigation section of this report, the proposal described in the EA is unlikely to have significant effects on ambient air quality, water quality, wetlands, wildlife resources, forest resources, historic resources, and solid and hazardous wastes. It is unlikely to adversely affect species of animals, plants or insects listed by state agencies as rare, threatened, or endangered.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Fisheries. The EA (page 4-35) states that the use of chaff and flares during training exercises increases the potential for plastics to end up in aquatic ecosystems and in the ocean.

1(a) Agency Jurisdiction. The Virginia Marine Resources Commission (VMRC) (Virginia Code Section 28.2-200 to 28.2-713) and the Department of Game and Inland Fisheries (DGIF) (Virginia Code Section 29.1-100 to 29.1-570) administer fisheries management policies in the Commonwealth of Virginia.

1(b) Agency Finding. VMRC states that the loss of residual plastic components into the Atlantic Ocean represents a potential hazard to marine resources.

1(c) Agency Recommendation. VMRC recommends that the plastic components be properly managed to reduce or eliminate risks to marine species.

2. Air Quality. The EA (page 4-30) states that no mitigation for air quality impacts would be required.

2(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 *et seq.*). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal

obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. As a part of this mandate, environmental impact reviews (EIRs) of projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with construction projects are:

- Open burning: 9VAC5-130 *et seq.*
- Fugitive dust control: 9VAC5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9VAC5-80-1100 *et seq.*

2(b) Ozone Attainment Area. The project site is located in an ozone attainment area and an emission control area for volatile organic compounds (VOCs) and oxides of nitrogen (NO_X), which are contributors to ozone pollution.

2(c) Agency Recommendation. DEQ recommends that all precautions are necessary to restrict the emissions of VOCs and NO_X.

3. Natural Heritage Resources. The EA (page 4-36) states that there is the potential for components of chaff and flares that remain after use to make their way to the surface of the Atlantic Ocean where they could be ingested by birds, marine mammals, sea turtles, and fish.

3(a) Agency Jurisdiction.

3(a)(i) The Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH): DNH's mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and to protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

Combat Air Forces Contract Adversary Air Support
DEQ 19-097F
Page 4

3(a)(ii) The Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

3(b) Agency Findings – Natural Heritage Resources. The Biotics Data System documents the presence of natural heritage resources within the project boundary including a 100-foot buffer. However, due to the scope of the activity, DCR DNR not anticipate that this project will adversely impact these natural heritage resources.

DCR states that a documented occurrence of a state and federally listed animal is located within the project site. The Virginia Department of Game and Inland Fisheries (DGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. The database may be accessed from http://vafwis.org/fwis/ or contacting DGIF (Ernie Aschenbach at [redacted] or [redacted].

3(c) Agency Findings – State Natural Area Preserves. DCR state that there are no State Natural Area Preserves under its jurisdiction in the project vicinity.

3(d) Agency Findings – Endangered Plant and Insect Species. DCR states that the current activity will not affect any documented state-listed plants or insects.

3(e) Agency Recommendations.

- Continue to coordinate with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and DGIF, Virginia's regulatory authority for the management and protection of the identified species, to ensure compliance with protected species legislation.
- Contact the DCR DNH and resubmit project information if the scope of the project changes and/or six months has passed before it is utilized.

4. Historic and Archaeological Resources. The EA (page 4-43) states that the interior modifications to Hangar 751 are not expected to affect any characteristics that contribute to the hangar's historic significance or its overall contribution to the historic district.

4(a) Agency Jurisdiction. The Virginia Department of Historic Resources (DHR) conducts reviews of both federal and state projects to determine their effect on historic properties. Under the federal process, DHR is the State Historic Preservation Office, and ensures that federal undertakings – including licenses, permits, or funding – comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulation at 36 CFR Part 800. Section 106 requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places. For state projects or activities on state lands, DHR is afforded an opportunity to review and comment on (1) the demolition of state property; (2) major state projects requiring an EIR; (3) archaeological investigations on state-controlled land; (4) projects that involve a landmark listed in the Virginia Landmarks Register; (5) the sale or lease of surplus state property; (6) exploration and recovery of underwater historic properties; and (7) excavation or removal of archaeological or historic features from caves. See DHR's website for more information about applicable state and federal laws and how to submit an application for review: http://www.dhr.virginia.gov/StateStewardship/Index.htm.

4(b) Agency Finding. According to the EA, the Proposed Action and the two other alternatives will not involve any ground disturbance. Alternatives 1 and 2 would involve the use of Hangar 751, a property contributing to the Langley Field Historic District and eligible for listing in the National Register of Historic Places.

4(c) Agency Recommendation. Coordinate with DHR if either Alternative 1 or 2 is selected as DHR would like the opportunity to review and comment on any alterations planned for Hangar 751 to accommodate ADAIR.

4(d) Requirement. The Air Force or its agents should consult directly with DHR, as necessary, pursuant to Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800, which require federal agencies to consider the effects of their undertakings on historic properties.

5. Local Government Review. As customary, DEQ distributed a copy of the EA to the affected localities and planning district commission.

5(a) Jurisdiction. Virginia Code §15.2-2202.A requires that the DEQ distribute a copy of the submitted EIR to the chief administrative officer of every locality in which each the project is proposed to be located. The purpose of the distribution is to enable the locality to evaluate the proposed project for environmental impact, consistency with the locality's comprehensive plan, local ordinances adopted pursuant to this chapter and other applicable law and to provide the locality with an opportunity to comment. DEQ is required to distribute the reports to localities, solicit their comments and consider their

responses in substantially the same manner as the department solicits and receives comments from state agencies.

5(b) Agency Comments. York County has no comments on the proposed project.

REGULATORY AND COORDINATION NEEDS

1. Natural Heritage Resources.

- Coordinate with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) (Christine Vaccaro at [redacted] and DGIF (Amy Ewing at [redacted]) to ensure compliance with protected species legislation.
- Contact the DCR DNH (804-371-2708) and re-submit project information and a map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

2. Historic Resources. Coordinate with DHR (Marc Holma at [redacted] either Alternative 1 or 2 is selected as DHR would like the opportunity to review and comment on any alterations planned for Hangar 751 to accommodate ADAIR. The Air Force or its agents should continue to consult directly as necessary with DHR, as necessary, pursuant to Section 106 of the National Historic Preservation Act (as amended) and its implementing regulations codified at 36 CFR Part 800, which require federal agencies to consider the effects of their undertakings on historic properties.

3. Federal Consistency Determination. DEQ believes that effects on coastal resources may result from implementation of the proposed action and recommends that the Air Force either submit a federal consistency determination or negative determination to DEQ pursuant to the Coastal Zone Management Act (CZMA) of 1972, as amended (16 USCA, CZMA § 307, § 1456(c)(3)(A)) and its implementing federal consistency regulations (15 CFR Part 930, subpart C). Coordinate directly with the DEQ Office of Environmental Impact Review for the submittal of FCDs. Information on document submission is available at http://www.deq.virginia.gov/Programs/ EnvironmentalImpactReview/DocumentSubmissions.aspx. Information on FCDs is available at http://www.deq.virginia.gov/Programs/ EnvironmentalImpact Review/FederalConsistencyReviews.aspx.

Thank you for the opportunity to comment on this draft EA. If you have questions, please do not hesitate to call me at [redacted] or Julia Wellman at [redacted]

Sincerely,

Bettina Rayfield, Manager
Environmental Impact Review and Long Range
Priorities Program

Enclosures

ec: Amy Ewing, DGIF
Robbie Rhur, DCR
Roger Kirchen, DHR
Anthony Watkinson, VMRC
Neil Morgan, York County
Ben McFarlane, HRPDC

7/29/2019 Commonwealth of Virginia Mail - Project Number DEQ #19-067F - York County Review

Commonwealth of Virginia

Wellman, Julia [redacted]

Project Number DEQ #19-067F - York County Review

1 message

Cross, Tim [redacted] Thu, Jul 25, 2019 at 3:57 PM
To: "Julia.Wellman@deq.virginia.gov" [redacted]
Cc: "Kassel, Susan" [redacted]

Ms. Wellman,

We have reviewed the document and have no comments at this time. Please note that the Department of the Air Force has contacted our County Administrator directly to request the County's comments on this project, and he will be providing a written response.

Thank you for the opportunity to review and comment.

Sincerely,

Tim Cross

York County VIRGINIA

Timothy C. Cross, AICP | Deputy Director of Planning and Development Services | County of York, Virginia | P.O. Box 532 | Yorktown VA 23690 | Phone: [redacted]

From: Fulcher, Valerie <[redacted]
Sent: Thursday, July 11, 2019 2:36 PM
To: rr dgif-ESS Projects [redacted] Roberta Rhur [redacted]; Carlos Martinez <[redacted]; Kotur Narasimhan [redacted] Roger Kirchen [redacted]; Anthony Watkinson [redacted]>; Ben McFarlane <b [redacted]>; [redacted]; Kassel, Susan [redacted]>; Russell Harrington <[redacted]
Cc: Wellman, Julia <[redacted]
Subject: EXPEDITED REVIEW--NEW PROJECT--AIR FORCE Combat Air Forces 19-067F

Good afternoon - this is a new OEIR review request/project:

https://mail.google.com/mail/u/0?ik=20360974b0&view=pt&search=all&permthid=thread-f%3A1640061602980535614%7Cmsg-f%3A1640061602980… 1/3

Document Type: Environmental Assessment

Project Sponsor: Department of the Air Force

Project Title: Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis, Langley Air Force Base

Location: City of Hampton, York County

Project Number: DEQ #19-067F

The document is available at https://www.jble.af.mil/Portals/46/633%20Environmental/ADAIR%20Langley%20Draft%20EA%20(Jul%202019).pdf?ver=2019-07-09-112915-107.

The due date for comments is JULY 25, 2019 You can send your comments either directly to JULIA WELLMAN by email [redacted], or you can send your comments by regular interagency/U.S. mail to the Department of Environmental Quality, Office of Environmental Impact Review, 1111 East Main St., Richmond, VA 23219.

NOTE: The review period is short because of the federal deadline.

If you cannot meet the deadline, please notify the project coordinator prior to the comment due date. Arrangements may be made to extend the deadline for comments if possible. An agency will be considered to have no concerns if comments are not received (or contact is made) within the review period. However, it is important that agencies consistently participate in accordance with Virginia Code Section 10.1-1192.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been previously reviewed (e.g. as a draft EIS or a Part 1 EIR), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency (agency stationary or email) and include the project number on all correspondence.

If you have any questions, please email Julia.

Thanks!

Valerie

--

Valerie A. Fulcher, CAP, OM, Environmental Program Specialist

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

[redacted]

804/698-4319 (Fax)

email: [redacted]

http://www.deq.virginia.gov/Programs/EnvironmentalImpactReview.aspx

For program updates and public notices please subscribe to the OEIR News Feed

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DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: Julia H. Wellman **DEQ - OEIR PROJECT NUMBER: DEQ #19-067F**

PROJECT TYPE: ☐ STATE EA / EIR ☐ FEDERAL EA / EIS ☐ SCC

☐ CONSISTENCY CERTIFICATION

PROJECT TITLE: **Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis, Langley Air Force Base**

PROJECT SPONSOR: **Department of the Air Force**

PROJECT LOCATION: x OZONE ATTAINMENT
AND EMISSION CONTROL AREA FOR NOX & VOC

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: **X** Department of the Air Force

☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-45-760 et seq. – Asphalt Paving operations
3. **X** **9 VAC 5-130 et seq. – Open Burning**
4. **X** **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
5. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
6. ☐ 9 VAC 5-60-300 et seq. – Standards of Performance for Toxic Pollutants
7. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
8. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
9. ☐ 9 VAC 5-80-1605 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
10. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
11. ☐ 9 VAC 5-80-800 et seq. Of the regulations – State Operating Permits. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_X).



(Kotur S. Narasimhan)
Office of Air Data Analysis **DATE: July 11, 2019**

Matthew J. Strickler
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Russell W. Baxter
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Thomas L. Smith
Deputy Director of Operations

MEMORANDUM

DATE: July 25, 2019

TO: Julia Wellman, DEQ

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DEQ 19-067F, JBLE-Langley Combat Air Forces Adversary Air Support

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources within the project boundary including a 100ft buffer. However, due to the scope of the activity we do not anticipate that this project will adversely impact these natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Ernie Aschenbach at [redacted] or [redacted]. A documented occurrence of a state and federally listed animal is located within the project site. Therefore, DCR recommends continued coordination with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and the VDGIF, Virginia's regulatory authority for the management and protection of this species to ensure compliance with protected species legislation.

600 East Main Street, 24th Floor | Richmond, Virginia 23219 | 804-786-6124

State Parks • Soil and Water Conservation • Outdoor Recreation Planning
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Cc: Christine Vaccaro, NOAA Fisheries-Protected Species Division
Amy Ewing, VDGIF

COMMONWEALTH of VIRGINIA

Department of Historic Resources

Matt Strickler
Secretary of Natural Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

29 July 2019

Ms Brenda W. Cook
633 CES/CD
37 Sweeney Blvd.
JBLE-Langley Virginia 23665-2107

RE: Draft Environmental Assessment for the proposed Combat Air Forces contract adversary air support at Joint Base Langley-Eustis, Langley Air Force Base, Virginia
DHR File No. 2019-0438

Dear Ms Cook:

The Department of Historic Resources (DHR) has received your undated letter initiating consultation with our office on a draft Environmental Assessment (EA) for the proposed Combat Air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis (JBLE), Langley Air Force Base, Virginia. The proposed action would include the addition of an estimated 91 contracted maintainers and 18 contracted pilots. Approximately 4,000 contracted sorties would be flown by an estimated 14 contracted aircraft performing training activities within airspace near JBLE-Langley over the Atlantic Ocean.

The Proposed Action would use existing facilities at JBLE-Langley to include the required ramp space, maintenance space, operational space, petroleum, oil, and lubricant storage, and runway access. According to the EA the Proposed Action and the two other alternatives will not involve any ground disturbance. Alternatives 1 and 2 would involve the use of Hangar 751, a property contributing to the Langley Field Historic District, a property eligible for listing in the National Register of Historic Places. If either of these alternatives is selected DHR would like the opportunity to review and comment on any alterations planned for Hangar 751 to accommodate ADAIR.

If you have any questions about our comments, please contact me at [redacted]

Sincerely,

Marc Holma
Review and Compliance Division

C: Mr. David Jennings, Air Force
Ms Julia Wellman, DEQ

Administrative Services
10 Courthouse Ave.
Petersburg, VA 23803
Tel: (804) 862-6408
Fax: (804) 862-6196

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
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Western Region Office
962 Kime Lane
Salem, VA 24153
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Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Commonwealth of Virginia

Wellman, Julia [redacted]

Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis (DHR #2019-0438/DEQ #19-067F)

1 message

Holma, Marc [redacted] Fri, Jul 12, 2019 at 8:40 AM
To: Julia Wellman [redacted]

Julia,

The DHR received the above from DEQ for our review and comment. The project is subject to our review pursuant to Section 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR Part 800. To date, we have not been contacted by the Air Force at Langley-Eustis to initiate consultation on this undertaking per Section 106. In your response to the Air Force please remind them of their responsibility under Section 106 to consult with DHR on this undertaking. Once that is done we will copy DEQ on our response.

Sincerely,
Marc Holma

--
Marc Holma
Architectural Historian
Division of Review and Compliance
[redacted]

COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Matthew J. Strickler
Secretary of Natural Resources

Steven G. Bowman
Commissioner

July 15, 2019

Department of Environmental Quality
Attn: Julia Wellman
Office of Environmental Impact Review
1111 East Main St.
Richmond, VA 23219

Re: Environmental Assessment
Combat Air Forces Contract Adversary Air Support
DEQ #19-067F

Dear Ms. Wellman

This will respond to the request for comments regarding the Environmental Assessment for the Combat Air Forces Contract Adversary Air Support project (DEQ #19-067F), prepared by the United States Air Force. Specifically, the Air Force has proposed to provide air sortie training to contracted maintainers and pilots which may result in small plastic components landing on the surface of the Atlantic Ocean.

Please be advised that the Virginia Marine Resources Commission (VMRC) pursuant to Chapter 12, 13, & 14 of Title 28.2 of the Code of Virginia administers permits required for encroachments in, on or over State-owned submerged lands and impacts to tidal wetlands, beaches and dunes. The Commonwealth's jurisdictional submerged lands extend into the Atlantic Ocean offshore to a distance of 3 nautical miles as measured from the mean low water shoreline (Virginia's Territorial Sea). Since no direct impacts are proposed within tidal wetlands, beaches or dunes and there will be no proposed encroachment of submerged lands, please be advised that a permit will not be required from this office.

VMRC does, however, additionally administer the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches which comprise some of Virginia's Coastal Zone Management Program. The following additional comments are offered:

Fisheries and Shellfish: The resulting loss of residual plastic components into the Atlantic Ocean represents a potential hazard to marine resources and should be properly managed to reduce or eliminate risks to these species

State-owned Submerged Lands: The resulting loss of residual plastic components into the Atlantic Ocean represents a potential hazard to marine resources and should be properly managed to reduce or eliminate risks to these species

State-owned Tidal Wetlands: None in close proximity to the project area

An Agency of the Natural Resources Secretariat
www.mrc.virginia.gov
Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

Department of Environmental Quality
July 15, 2019
Page Two

Beaches and Coastal Primary Sand Dunes: None in close proximity to the project area

As proposed, we have no objection to the consistency findings provided by the applicant but reiterate our caution about marine plastics. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

If you have any questions please contact me at [redacted] or by email at [redacted] Thank you for the opportunity to comment.

Sincerely,

Allison Lay

Allison Lay
Environmental Engineer, Habitat Management

AEL/keb
HM

From: JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted]
Sent: Monday, August 12, 2019 11:06 AM
To: Stumpf, Christa [USA - EMP]
Subject: FW: [Non-DoD Source] Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis (DHR #2019-0438/DEQ #19-067F)

Christa,
I asked SHPO about the comments on the EA, answer below. I think that should address the concerns on that issue.

v/r,

Dave

David Jennings
Environmental Engineer
633 CES / CEIE
37 Sweeney Blvd
Langley AFB, VA 23665
[redacted]

From: Holma, Marc [redacted]
Sent: Monday, August 12, 2019 10:50 AM
To: JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted]
Subject: Re: [Non-DoD Source] Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis (DHR #2019-0438/DEQ #19-067F)

Thanks, David.

What you describe doesn't sound like anything that would concern me. Let me know if anything changes.

Marc

On Mon, Aug 12, 2019 at 10:44 AM JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted]> wrote:

> Marc,
>
> I wanted to follow up with you on your comments for this project. At present, the only planned modifications to Hangar 751 are upgrades to office spaces; i.e, new carpet and paint. If that changes I'll submit the project via the ePIX system for review.
>
> R,

1

Dave

David Jennings

Environmental Engineer

633 CES / CEIE

37 Sweeney Blvd

Langley AFB, VA 23665

[redacted]

From: Holma, Marc [redacted]
Sent: Monday, July 29, 2019 10:15 AM
To: JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted] Julia Wellman [redacted]
Subject: [Non-DoD Source] Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis (DHR #2019-0438/DEQ #19-067F)

Here are our comments on the above referenced project.

Marc

--

Marc Holma

Architectural Historian

Division of Review and Compliance

2

[redacted]

[redacted]

--
Marc Holma
Architectural Historian
Division of Review and Compliance
[redacted]

3

From: JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted]
Sent: Friday, August 23, 2019 2:30 PM
To: Stumpf, Christa [USA - EMP]
Subject: FW: [Non-DoD Source] RE: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR COMBAT AIR FORCES ADVERSARY AIR, JOINT BASE LANGLEY-EUSTIS, LANGLEY AIR FORCE BASE
Attachments: ADAIR Langley Draft EA -AQ Comments .docx

Christa,
Comments keep trickling in. This from EPA.

v/r,

Dave

David Jennings
Environmental Engineer
633 CES / CEIE
37 Sweeney Blvd
Langley AFB, VA 23665
[redacted]

From: Traver, Carrie [redacted]
Sent: Friday, August 23, 2019 2:24 PM
To: 633 CES/CEIE NEPA Public Comment <633CES.CEIE.NEPAPublicComment@us.af.mil>; JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted]
Cc: Rudnick, Barbara <[redacted]
Subject: [Non-DoD Source] RE: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR COMBAT AIR FORCES ADVERSARY AIR, JOINT BASE LANGLEY-EUSTIS, LANGLEY AIR FORCE BASE

Dear Mr. Jennings,

Please see the attached document, in which detailed comments were provided by our Air and Radiation Division. We ask that you consider these comments. If you have questions or would like to discuss them further, we can arrange a call with the technical staff.

Thank you,
Carrie Traver

From: Traver, Carrie
Sent: Thursday, August 22, 2019 5:08 PM
To: 633CES.CEIE.NEPAPublicComment@us.af.mil; [redacted]
Cc: Rudnick, Barbara [redacted]
Subject: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR COMBAT AIR FORCES ADVERSARY AIR, JOINT BASE LANGLEY-EUSTIS, LANGLEY AIR FORCE BASE

1

Dear Mr. Jennings,

Thank you for the opportunity to review the *Draft Environmental Assessment for Combat Air Forces Adversary Air, Joint Base Langley-Eustis, Virginia,* dated July 2019.

The Draft Environmental Assessment (EA) analyzes the potential environmental consequences associated with establishing dedicated contract adversary air (ADAIR) support at Joint Base Langley-Eustis (JBLE.) The purpose of the Proposed Action is to provide ADAIR sorties to improve the quality of training and readiness of fighter pilots of the Combat Air Forces (CAF) supported by JBLE-Langley, Virginia. By providing a dedicated contract ADAIR capability, CAF pilots would gain more realistic training and use available flying hours to focus on increasing their levels of proficiency and readiness.

The Proposed Action at JBLE-Langley would include the addition of 109 contract personnel who would operate an estimated 14 aircraft. Approximately 4,000 sorties annually would support training activities of the 1st Fighter Wing and 192d Fighter Wing and other units within special use airspace, including Warning Areas W-386, W-72, and W-122.

USEPA has reviewed the EA in accordance with the National Environmental Policy Act (NEPA) of 1969, Section 309 of the Clean Air Act, and the Council on Environmental Quality regulations implementing NEPA. Based our review, we have the following comments for your consideration in the development of the Final EA:

Noise

Thank you for thoroughly analyzing the noise impacts on the surrounding community, including the background documentation on considerations of aircraft type, event (flight or stationary), flight path, altitude, time of day, and other factors. As documented in the EA, noise impacts from the approximately 25% increase in number of annual operations could be substantial; noise impacts on children in daycare and educational facilities could be significant and minority populations could experience disproportionate effects.

The EA concluded that operational mitigation measures would need to be applied to the Proposed Action to reduce noise impacts to less than significant only if the High Noise Scenario was implemented. However, perception of noise and impacts on the community could be substantial even in the Medium or Low Noise Scenarios, especially give the 97% increase in night sorties and the sporadic nature of military overflight events.

It should also be noted that these scenarios are based on modeling the 24-hour Day-Night Average Sound Level; not only is this an "average" of all noise events on an annual basis, but as this is a model, and all models are based on a number of assumptions, the actual noise experienced may be more substantial than anticipated. Therefore, we suggest that you engage the potentially impacted communities and respond to concerns that may occur with the implementation of the action. Further, we recommend that noise impact mitigation be considered even under the expected Medium or Low Noise Scenarios if adverse impacts are experienced by the community.

Wildlife

The ADAIR operations could also potentially impact wildlife. As identified in Section 4.5.2, impacts to wildlife include noise, residual materials from defensive countermeasures, and bird/wildlife-aircraft strike hazard (BASH) procedures. The EA concludes that noise impacts from increased operations at JBLE-Langley would have a negligible, short-term and long-term effect on wildlife. It would be helpful if the EA included additional information to more clearly document the finding that wildlife impacts are negligible. For example, the impacts on wildlife from implementing the existing BASH plan and the contract ADAIR BASH plan are listed as "minor" but are unclear. The specific impacts of the hazard abatement program, which includes control of bird and animals as well as monitoring and avoidance, is not detailed in the EA.

As indicated in the EA, small plastic caps and pistons associated with defensive countermeasures may be consumed by birds, marine mammals, and sea turtles. Consumption of plastics has well-documented harmful impacts on variety of marine organisms, particularly sea turtles and seabirds. As recent studies continue to

document the hazards of plastics on marine life, a more comprehensive assessment of the potential of the plastics to be ingested by sea creatures may be helpful to fully evaluate impacts.

The Air Force has made a 'may affect but not likely to adversely affect' determination for the Bermuda petrel, roseate tern, federally listed marine mammals, federally listed sea turtles, and the Atlantic sturgeon. Letters requesting concurrence with this determination have been sent to US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). We recommend that you implement recommendations from USFWS and NMFS and from state agencies to reduce impacts on wildlife, especially species of special concern, and document this in the EA.

We encourage you to consider employing potential long-term actions and alternatives that would reduce impacts to wildlife, such as replacing impulse cartridges and initiators in future procurements of flares with models that do not contain chromium, lead, or other pollutants as discussed. In addition, pursuing alternatives that reduce release of plastic and/or make plastic components less likely to be consumed could reduce impacts to wildlife.

Cumulative effects
As indicated in Section 5.0, permanent beddown of F-22 FTU at JBLE is also being evaluated. It would be helpful to clarify the cumulative effects from noise impacts from the proposed project and the FTU beddown.

Air Quality
We will forward comments from our *Planning and Implementation Branch, Air and Radiation Division.*

Again, thank you for providing us with notice to review the EA. If you have any questions or would like to discuss these comments, please don't hesitate to contact me.

Sincerely,
Carrie

Carrie Traver
Life Scientist
Office of Communities, Tribes, & Environmental Assessment
U.S. Environmental Protection Agency, Region 3
1650 Arch Street – 3RA10
Philadelphia, PA 19103
[redacted]

Comments on Draft Environmental Assessment Combat Air Forces Adversary Air Joint Base Langley-Eustis, Langley Air Force Base, Virginia

Prepared by Sara Calcinore
Planning and Implementation Branch, Air and Radiation Division

Draft Environmental Assessment (EA) for Combat Air Forces Adversary Air Joint Base Langley-Eustis, Langley Air Force Base, Virginia

3.4.2.2 Baseline Air Emissions

To clarify, the Hampton Roads Intrastate AQCR (40 CFR 81.93) was not designated nonattainment for the 1997 ozone National Ambient Air Quality Standards (NAAQS). The Norfolk-Virginia Beach-Newport News (Hampton Roads), VA area, which includes Hampton City, was designated nonattainment and was later redesignated to attainment so that it is now a maintenance area. See 72 FR 30490, 6/1/2007, and 40 CFR 81.347. Therefore, the relevant area to refer to when discussing nonattainment and maintenance is the Norfolk-Virginia Beach-Newport News (Hampton Roads), VA Area, also referred to as the "Hampton Roads Area".

It is recommended that an emissions inventory showing existing conditions in the Hampton Roads Area be added to section 3.4.2.2 Baseline Air Emissions.

The following is suggested language to use in place of the existing general conformity discussion beginning on page 3-20. Note that this suggested language is based on the information in the draft EA that states that the general conformity rule does not apply. The USAF program office is advised to contact the appropriate attorney responsible for this project for guidance:

> The Hampton Roads Area (also referred to as the "Area") is designated attainment for all criteria pollutants except the 1997 8-hour ozone NAAQS, for which the Area is a maintenance area. The Area was designated as marginal nonattainment for the 0.080 parts per billion (ppb) 1997 8-hour ozone NAAQS on April 15, 2004 (69 FR 23857, 4/30/2004). The Area, after attaining the standard, was redesignated to attainment effective July 28, 1997 (62 FR 34408, June 26, 1997). At that time, the EPA approved the state's proposed plan to maintain the standard for at least the next 10 years. Thus, the Hampton Roads Area was applicable under the section 176(c) CAA conformity requirement as a maintenance area for the 1997 ozone NAAQS. Whether or not the state submitted a maintenance plan to cover a full 20 years following redesignation to attainment, the Hampton Roads Area would remain a maintenance area, for purposes of the Clean Air Act (CAA) conformity, until July 28, 2027.
>
> However, in the subsequent promulgation and implementation of the 2008 8-hour ozone NAAQS in 2015, (80 FR 12264, March 6, 2015), the Hampton Roads Area was designated attainment. In the same rule, the EPA revoked the 1997 ozone NAAQS saying areas designated attainment for the 2008 ozone NAAQS would no longer be subject to the CAA conformity requirement even though they were nonattainment or maintenance areas for the 1997 ozone NAAQS.
>
> Litigation ensued under *South Coast Air Quality Management District v. EPA* (Case No. 15-1115) challenging this and other elements of the final rule. The Circuit Court of Appeals for the District of Columbia, referring to such 1997 ozone areas as "orphan areas," held that the EPA did

not have the authority to waive the conformity requirements that would otherwise apply to the 1997 ozone orphan maintenance areas. Further, the court said the EPA lacked authority to revoke transportation conformity for orphan maintenance areas, saying nothing with respect to general conformity.

Therefore, because the February 16, 2018, D. C. Circuit decision in *South Coast v. EPA* is ambiguous with regard to whether the court's holdings on transportation conformity requirements for 1997 ozone orphan areas also apply to general conformity, each federal agency is advised to make its own decision about whether general conformity applies to their projects. As such, the USAF had determined it will not prepare a general conformity evaluation for this project with respect to the 1997 ozone maintenance area.

In the discussion of prevention of significant deterioration (PSD) on page 3-21, it is suggested that the following language be added:

JBLE-Langley is not classified a major source for PSD and is not located within 10 km of any of the 156 USEPA-designated Class I areas protected by the Regional Haze Rule. Thus, the project requires no analysis with respect to the PSD requirements under 40 CFR 51.166. As the area is not nonattainment for any criteria pollutant, the project requires no analysis with respect to the nonattainment-New Source Review (NSR) requirements under 40 CFR 51.165.

It is recommended that the sentence on page 3-21 include the words added in italics: "Mobile sources, such as vehicle and aircraft emissions, are generally not regulated *under permitting requirements* and are not covered under existing stationary source permitting requirements

3.4.3.2 Baseline Emissions

The NAAQS apply to offshore jurisdictional areas regardless of whether the warning areas fall outside jurisdictional offshore waters. No analysis will be prepared for the offshore jurisdictional waters because there are no surface-based operations proposed for that area that would cause project related emissions.

Appendix C-1: Air Conformity Applicability Analysis

C.1.1 Air Quality Program Overview

It is recommended that the 1997 and 2008 ozone NAAQS be added to Table C-1 National Ambient Air Quality Standards on page C-6 and that the standard currently listed be identified as the 2015 ozone NAAQS. In addition, the "Particulate <10 Micrometers (PM_{10})" heading should be revised to "Particulate <=10 Micrometers (PM_{10})" and the "Particulate <2.5 Micrometers ($PM_{2.5}$)" heading should be revised to "Particulate <=2.5 Micrometers ($PM_{2.5}$)".

In Table C-2 General Conformity Rule *De minimis* Emission Thresholds on page C-7, the precursors of $PM_{2.5}$ are presumptive and will be accounted for in a $PM_{2.5}$ nonattainment or maintenance area under general conformity if an evaluation is prepared. EPA is taking steps to correct this error in the definition of $PM_{2.5}$ in 40 CFR 93.152. For clarification, please see 81 FR 58010, 58014 (August 24, 2016). Therefore, it is requested that the existing language in the table for $PM_{2.5}$ be revised to read the following:

$PM_{2.5}$
Direct emissions, SO_2, NO_x, VOC and ammonia

For the discussion of PSD on page C-7, it is sufficient to say that there are no project related emissions from new or modified stationary sources, therefore, PSD does not apply.

C.1.2 Assumptions

For assumption 3 or 4, it is recommended that an explanation be added as to why delivering additional fuel to the airfield and into the existing storage tanks will not cause evaporative emissions above what is experienced under existing conditions. What measures are in place to prevent additional evaporative emissions?

The following is suggested language for assumption 12:

> Assume once an aircraft is out of the LTO cycle, flight time to/from the warning areas (5 to 10 minutes) would be at an altitude greater than 3,000 feet above ground level causing negligible impacts to ground-level air quality.

C.1.3 Regulatory Comparisons

It is recommended that the first sentence of this section be revised to "The conformity requirement under CAA section 176(c), and the implementing regulations under 40 CFR part 93, subpart B for general federal actions, requires…" CAA section 176(c) is the federal conformity requirement and applies to both general and transportation conformity projects. The general conformity rule (i.e. regulations) can be found at 40 CFR part 93, subpart B.

To clarify, if the emissions from a federal action proposed in a nonattainment area **equal** or exceed annual *de minimis* thresholds identified in the rule, a formal conformity determination is required for that action.

Appendix C-2: Detailed Air Conformity Applicability Model Sample Report (Airfield – High)

2.1 General Information & Timeline Assumptions

Please clarify if the emissions calculations presented in this section are for the general conformity applicability analysis or the analysis for the NEPA assessment of air quality impacts. As stated previously, there should be no general conformity applicability analysis if USAF has determined that general conformity does not apply for this project.

Appendix C-3 Summary Air Conformity Applicability Model Reports Record of Air Analysis (ROAA)

It is unclear why emissions are being compared to the general conformity threshold rates if USAF has determined that general conformity does not apply to the project. If this data is for the NEPA air quality assessment, it is recommended that the format of the table be revised. The table should indicate if the emissions estimates provided are net emissions for the project (total of direct and indirect emissions). If so, the net emissions estimates for the project should be compared to the no-build scenario for the same future year.

Page C-44 states, "Some estimated emissions associated with this action are above the General Conformity Rule (GCR) indicators, indicating a significant impact to air quality; therefore, further assessment is needed." It is unclear if USAF will do a general conformity determination or what other assessment USAF is planning to do. Are any measures planned to mitigate the carbon monoxide (CO) and nitrogen oxide (NO_x) emissions since the data indicates an exceedance?

From: JENNINGS, DAVID M GS-12 USAF ACC 633 CES/CEIE [redacted]
Sent: Thursday, August 22, 2019 3:13 PM
To: Stumpf, Christa [USA - EMP]
Subject: FW: [Non-DoD Source] Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) ADAIR EA &FONSI

Christa,
Comment from VDEQ Air folks.

v/r,

Dave

David Jennings
Environmental Engineer
633 CES / CEIE
37 Sweeney Blvd
Langley AFB, VA 23665
[redacted]

From: Ballou, Thomas [redacted]
Sent: Thursday, August 22, 2019 9:05 AM
To: 633 CES/CEIE NEPA Public Comment <633CES.CEIE.NEPAPublicComment@us.af.mil>
Subject: [Non-DoD Source] Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) ADAIR EA &FONSI

The Air & Renewable Energy Division of the Virginia Department of Environmental Quality (DEQ) has reviewed the Draft Environmental Assessment (EA) and Proposed Finding of No Significant Impact (FONSI) regarding the potential environmental impacts associated with the proposed Combat air Forces contract adversary air (ADAIR) support at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley), Virginia. As a result we offer the following comments on the EA and FONSI.

The draft assessment does correctly identify the Hampton Roads area in which the project is located as currently being in compliance with all National Ambient Air Quality Standards (NAAQS) and that the state and federal requirements for general conformity do not currently apply to the area or the proposed project. However, as also noted in the document the recent court decision (*South Coast Air Quality Management District v. EPA*) will impact the status of the Hampton Roads area with respect to the 1997 ozone standard in the near future. The result of this decision will require the Commonwealth to develop and implement a second 10-year maintenance plan in the Hampton Roads area for this standard. As part of the maintenance plan, the general conformity requirement will need to be addressed in some way that has yet to be determined. We are currently awaiting additional guidance from the EPA on this matter. As such, we have reviewed the air quality analysis in the draft assessment in light of the general conformity rule if it were to again apply to the Hampton Roads area.

The draft assessment identifies three emissions scenarios - low, medium, and high. While in most cases the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) in these scenarios are below what he de minimis threshold of significance for general conformity, the high scenario does include NOx

1

emissions that are above the 100 ton threshold. If general conformity applied to this project the FONSI for this scenario could not be supported, and the excess NOx emissions would need to be mitigated. While both the low and medium scenarios fall below the conformity thresholds, the low scenario would have the least impact on ozone air quality, and thus would be our preferred choice.

Thank you for the opportunity to comment on this project.

Thomas R. Ballou
Air Data Analysis & Planning Manager
Air and Renewable Energy Division
Virginia Department of Environmental Quality
[redacted]
www.deq.virginia.gov

APPENDIX B

NOISE

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Appendix B-1

Sound, Noise, and Potential Effects

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B.1 SOUND, NOISE, AND POTENTIAL EFFECTS

B.1.1 Introduction

This appendix discusses sound and noise and their potential effects on the human and natural environment. **Section B.1.2** provides an overview of the basics of sound and noise. **Section B.1.3** defines and describes the different metrics used to describe noise. The largest section, **Section B.1.4**, reviews the potential effects of noise, focusing on effects on humans but also addressing effects on property values, terrain, structures, and animals. **Section B.1.5** contains the list of references cited. **Appendix B-2** contains data used in the noise modeling process. A number of noise metrics are defined and described in this appendix. Some metrics are included for the sake of completeness when discussing each metric and to provide a comparison of cumulative noise metrics.

B.1.2 Basics of Sound

B.1.2.1 Sound Waves and Decibels

Sound consists of minute vibrations in the air that travel through the air and are sensed by the human ear. **Figure B-1** is a sketch of sound waves from a tuning fork. The waves move outward as a series of crests where the air is compressed and troughs where the air is expanded. The height of the crests and the depth of the troughs are the amplitude or sound pressure of the wave. The pressure determines its energy or intensity. The number of crests or troughs that pass a given point each second is called the frequency of the sound wave.

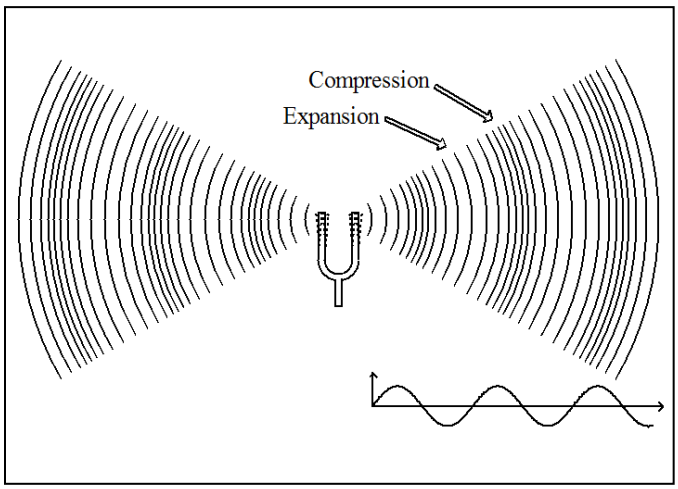


Figure B-1. Sound Waves from a Vibrating Tuning Fork.

The measurement and human perception of sound involves three basic physical characteristics: intensity, frequency, and duration.

- Intensity is a measure of the acoustic energy of the sound and related to sound pressure. The greater the sound pressure, the more energy carried by the sound and the louder the perception of that sound.
- Frequency determines how the pitch of the sound is perceived. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.
- Duration or the length of time the sound can be detected.

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times higher than those of sounds barely heard. Because of this vast range, it is unwieldy to use a linear scale to represent the intensity of sound. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound. Such a representation is called a sound level. A sound level of 0 dB is approximately the threshold of human hearing and barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 and 140 dB are felt as pain (Berglund and Lindvall, 1995).

As shown on **Figure B-1**, the sound from a tuning fork spreads out uniformly as it travels from the source. The spreading causes the sound's intensity to decrease with increasing distance from the source. For a source such as an aircraft in flight, the sound level will decrease by about 6 dB for every doubling of the distance. For a busy highway, the sound level will decrease by 3 to 4.5 dB for every doubling of distance.

As sound travels from the source, it also is absorbed by the air. The amount of absorption depends on the frequency composition of the sound, temperature, and humidity conditions. Sound with high frequency content gets absorbed by the air more than sound with low frequency content. More sound is absorbed in colder and drier conditions than in hot and wet conditions. Sound is also affected by wind and temperature gradients, terrain (elevation and ground cover), and structures.

Because of the logarithmic nature of the decibel unit, sound levels cannot simply be added or subtracted and are somewhat cumbersome to handle mathematically; however, some simple rules are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

60 dB + 60 dB = 63 dB, and
80 dB + 80 dB = 83 dB.

Second, the total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels is different than that of ordinary numbers, this process is often referred to as "decibel addition."

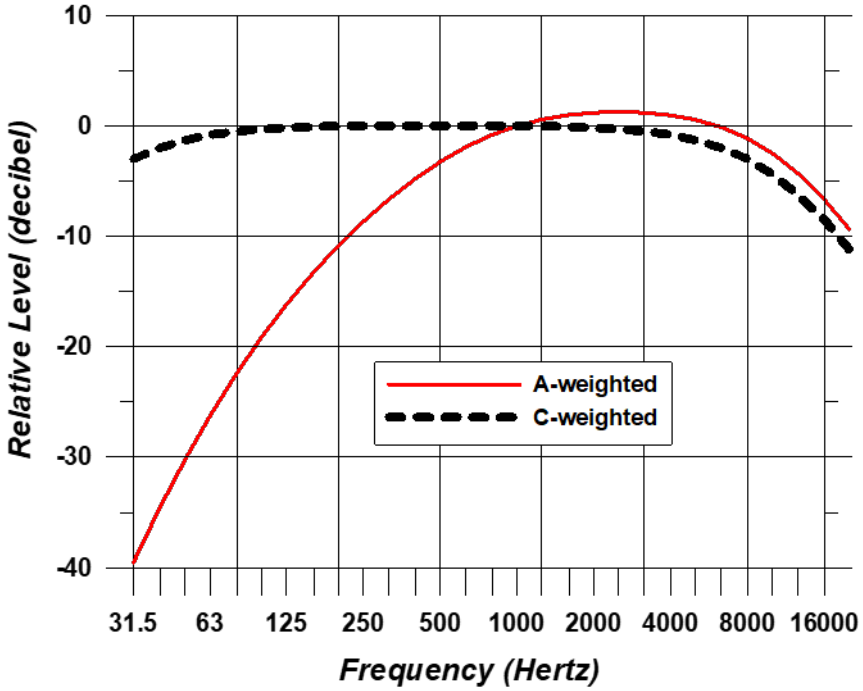
The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. On average, a person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness. This relation holds true for loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because the human ear does not respond linearly.

Sound frequency is measured in terms of cycles per second or hertz (Hz). The normal ear of a young person can detect sounds that range in frequency from about 20 to 20,000 Hz. As we get older, we lose the ability to hear high frequency sounds. Not all sounds in this wide range of frequencies are heard equally. Human hearing is most sensitive to frequencies in the 1,000 to 4,000 Hz range. The notes on a piano range from just over 27 to 4,186 Hz, with middle C equal to 261.6 Hz. Most sounds (including a single note on a piano) are not simple pure tones like the tuning fork on **Figure B-1** but contain a mix, or spectrum, of many frequencies.

Sounds with different spectra are perceived differently even if the sound levels are the same. Weighting curves have been developed to correspond to the sensitivity and perception of different types of sound. A-weighting and C-weighting are the two most common weightings. These two curves, shown on **Figure B-2**, are adequate to quantify most environmental noises. A-weighting puts emphasis on the 1,000- to 4,000-Hz range where human hearing is most sensitive.

Very loud or impulsive sounds, such as explosions or sonic booms, can sometimes be felt and cause secondary effects, such as shaking of a structure or rattling of windows. These types of sounds can add to

annoyance and are best measured by C-weighted sound levels, denoted dBC. C-weighting is nearly flat throughout the audible frequency range and includes low frequencies that may not be heard but cause shaking or rattling. C-weighting approximates the human ear's sensitivity to higher intensity sounds.



Source: ANSI S1.4A -1985 "Specification of Sound Level Meters"

Figure B-2. Frequency Characteristics of A- and C-Weighting.

B.1.2.2 Sound Levels and Types of Sounds

Most environmental sounds are measured using A-weighting. They are called A-weighted sound levels and sometimes use the unit dBA or dB(A) rather than dB. When the use of A-weighting is understood, the term "A-weighted" is often omitted and the unit dB is used. Unless otherwise stated, dB units refer to A-weighted sound levels.

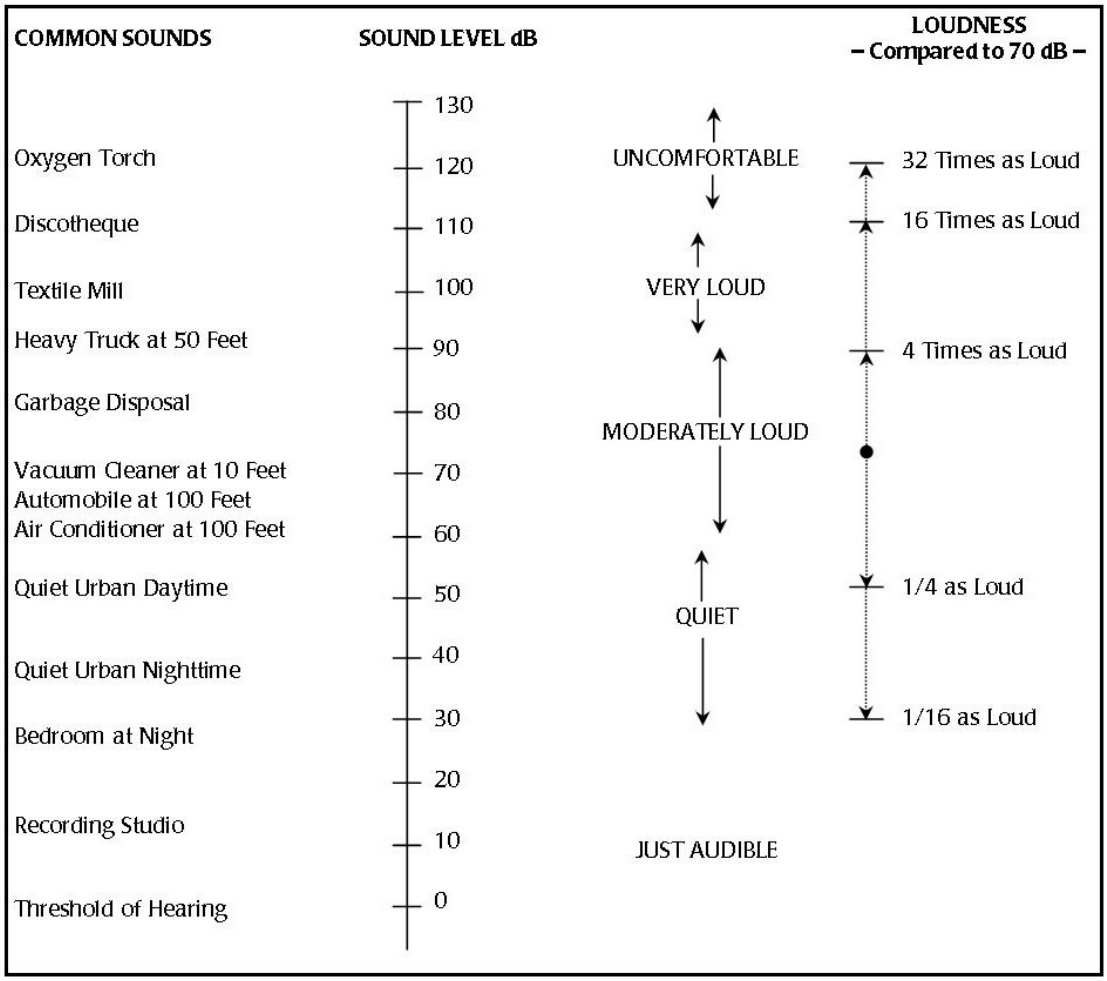
Sound becomes noise when it is unwelcome and interferes with normal activities, such as sleep or conversation. Noise is unwanted sound. Noise can become an issue when its level exceeds the ambient or background sound level. Ambient noise in urban areas typically varies from 60 to 70 dB but can be as high as 80 dB in the center of a large city. Quiet suburban neighborhoods experience ambient noise levels around 45 to 50 dB (United States Environmental Protection Agency [USEPA], 1978).

Figure B-3 shows A-weighted sound levels from common sources. Some sources, like the air conditioner and vacuum cleaner, are continuous sounds whose levels are constant for some time. Some sources, like the automobile and heavy truck, are the maximum sound during an intermittent event like a vehicle pass-by. Some sources like "urban daytime" and "urban nighttime" are averages over extended periods. A variety of noise metrics have been developed to describe noise over different time periods. These are discussed in detail in **Section B.1.3**.

Aircraft noise consists of two major types of sound events: flight (including takeoffs, landings, and flyovers) and stationary, such as engine maintenance run-ups. The former is intermittent and the latter primarily

continuous. Noise from aircraft overflights typically occurs beneath main approach and departure paths, in local air traffic patterns around the airfield, and in areas near aircraft parking ramps and staging areas. As aircraft climb, the noise received on the ground drops to lower levels, eventually fading into the background or ambient levels.

Impulsive noises are generally short, loud events. Their single-event duration is usually less than 1 second. Examples of impulsive noises are small-arms gunfire, hammering, pile driving, metal impacts during rail-yard shunting operations, and riveting. Examples of high-energy impulsive sounds are quarry/mining explosions, sonic booms, demolition, and industrial processes that use high explosives, military ordnance (e.g., armor, artillery and mortar fire, and bombs), explosive ignition of rockets and missiles, and any other explosive source where the equivalent mass of dynamite exceeds 25 grams (American National Standards Institute [ANSI], 1996).



Source: Harris, 1979

Figure B-3. Typical A-weighted Sound Levels of Common Sounds.

B.1.3 Noise Metrics

Noise metrics quantify sounds so they can be compared with each other and. with their effects, in a standard way. There are a number of metrics that can be used to describe a range of situations, from a particular

individual event to the cumulative effect of all noise events over a long time. This section describes the metrics relevant to environmental noise analysis.

B.1.3.1 Single Events

Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or Maximum Sound Level and is abbreviated L_{max}. The L_{max} is depicted for a sample event in **Figure B-4**.

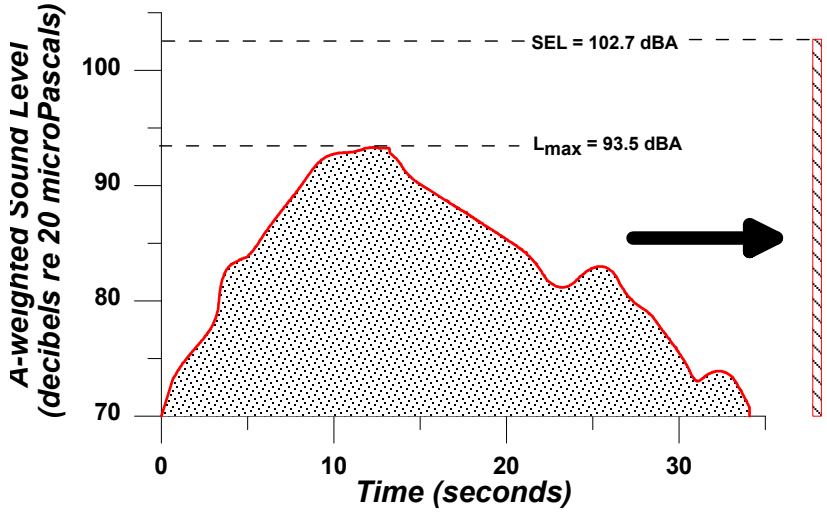
L_{max} is the maximum level that occurs over a fraction of a second. For aircraft noise, the "fraction of a second" is one-eighth of a second, denoted as "fast" response on a sound level measuring meter (ANSI, 1988). Slowly varying or steady sounds are generally measured over 1 second, denoted as "slow" response. L_{max} is important in judging if a noise event will interfere with conversation, television or radio listening, or other common activities. Although it provides some measure of the event, it does not fully describe the noise because it does not account for how long the sound is heard.

Peak Sound Pressure Level

The Peak Sound Pressure Level (L_{pk}) is the highest instantaneous level measured by a sound level measurement meter. L_{pk} is typically measured every 20 microseconds and usually based on unweighted or linear response of the meter. It is used to describe individual impulsive events such as blast noise. Because blast noise varies from shot to shot and varies with meteorological (weather) conditions, the US Department of Defense (DOD) usually characterizes L_{pk} by the metric PK 15(met), which is the L_{pk} exceeded 15 percent of the time. The "met" notation refers to the metric accounting for varied meteorological or weather conditions.

Sound Exposure Level

Sound Exposure Level (SEL) combines both the intensity of a sound and its duration. For an aircraft flyover, SEL includes the maximum and all lower noise levels produced as part of the overflight, together with how long each part lasts. It represents the total sound energy in the event. **Figure B-4** indicates the SEL for an example event, representing it as if all the sound energy were contained within 1 second.



Source: Wyle Laboratories

Figure B-4. Example Time History of Aircraft Noise Flyover.

Aircraft noise varies with time. During an aircraft overflight, noise starts at the background level, rises to a maximum level as the aircraft flies close to the observer, then returns to the background as the aircraft recedes into the distance. This is sketched on **Figure B-4**, which also indicates two metrics (L_{max} and SEL) that are described above. Over time there can be a number of events, not all the same. Because aircraft noise events last more than a few seconds, the SEL value is larger than L_{max}. It does not directly represent the sound level heard at any given time but rather the entire event. SEL provides a much better measure of aircraft flyover noise exposure than L_{max} alone.

Overpressure

The single event metrics commonly used to assess supersonic noise are overpressure in pounds per square foot and C-Weighted Sound Exposure Level (CSEL). Overpressure is the peak pressure at any location within the sonic boom footprint.

C-Weighted Sound Exposure Level

CSEL is SEL computed with C frequency weighting, which is similar to A-Weighting (discussed in **Section B.1.2.2**) except that C weighting places more emphasis on low frequencies below 1,000 hertz.

B.1.3.2 Cumulative Events

Equivalent Sound Level

Equivalent Sound Level (L_{eq}) is a "cumulative" metric that combines a series of noise events over a period of time. L_{eq} is the sound level that represents the decibel average SEL of all sounds in the time period. Just as SEL has proven to be a good measure of a single event, L_{eq} has proven to be a good measure of series of events during a given time period.

The time period of an L_{eq} measurement is usually related to some activity and is given along with the value. The time period is often shown in parenthesis (e.g., L_{eq}[24] for 24 hours). The L_{eq} from 7:00 a.m. to 3:00 p.m. may give exposure of noise for a school day.

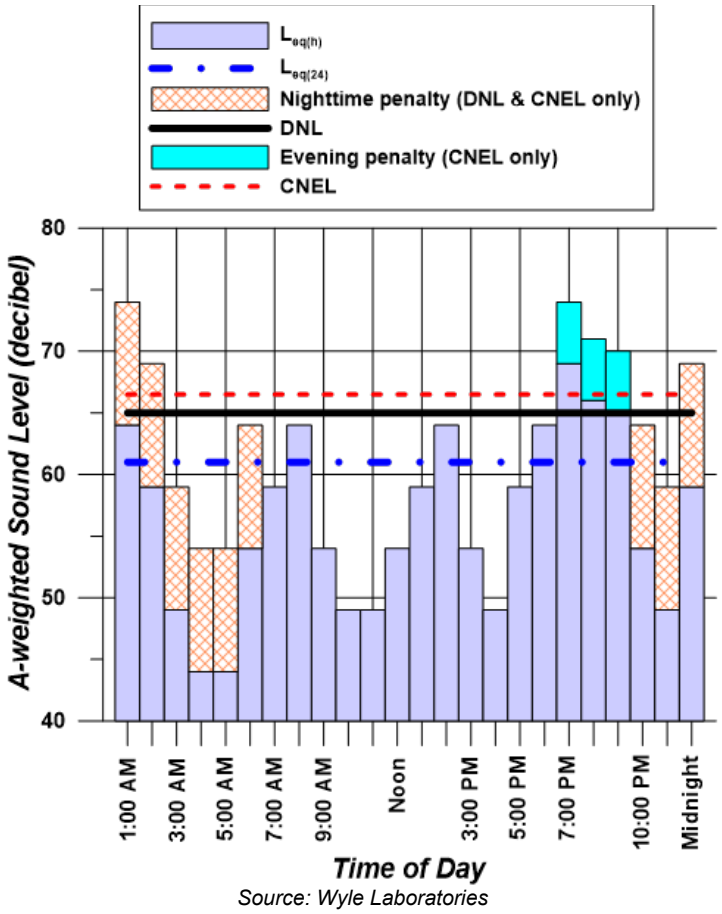
Figure B-5 gives an example of $L_{eq}(24)$ using notional hourly average noise levels (L_{eq}[h]) for each hour of the day as an example. The $L_{eq}(24)$ for this example is 61 dB.

Day-Night Average Sound Level and Community Noise Equivalent Level

Day-Night Average Sound Level (DNL or L_{dn}) is a cumulative metric that accounts for all noise events in a 24-hour period; however, unlike $L_{eq}(24)$, DNL contains a nighttime noise penalty. To account for our increased sensitivity to noise at night, DNL applies a 10-dB penalty to events during the nighttime period, defined as 10:00 p.m. to 7:00 a.m. The notations DNL and L_{dn} are both used for Day-Night Average Sound Level and are equivalent.

Community Noise Equivalent Level (CNEL) is a variation of DNL specified by law in California (California Code of Regulations Title 21, Public Works) (Wyle Laboratories, 1970). CNEL has the 10-dB nighttime penalty for events between 10:00 p.m. and 7:00 a.m. but also includes a 4.8-dB penalty for events during the evening period of 7:00 p.m. to 10:00 p.m. The evening penalty in CNEL accounts for the added intrusiveness of sounds during that period. For airports and military airfields, DNL and CNEL represent the average sound level for annual average daily aircraft events.

Figure B-5 gives an example of DNL and CNEL using notional hourly average noise levels (L_{eq}[h]) for each hour of the day as an example. Note the L_{eq}(h) for the hours between 10:00 p.m. and 7:00 a.m. have a 10-dB penalty assigned. For CNEL, the hours between 7:00 p.m. and 10:00 p.m. have a 4.8-dB penalty assigned. The DNL for this example is 65 dB. The CNEL for this example is 66 dB.



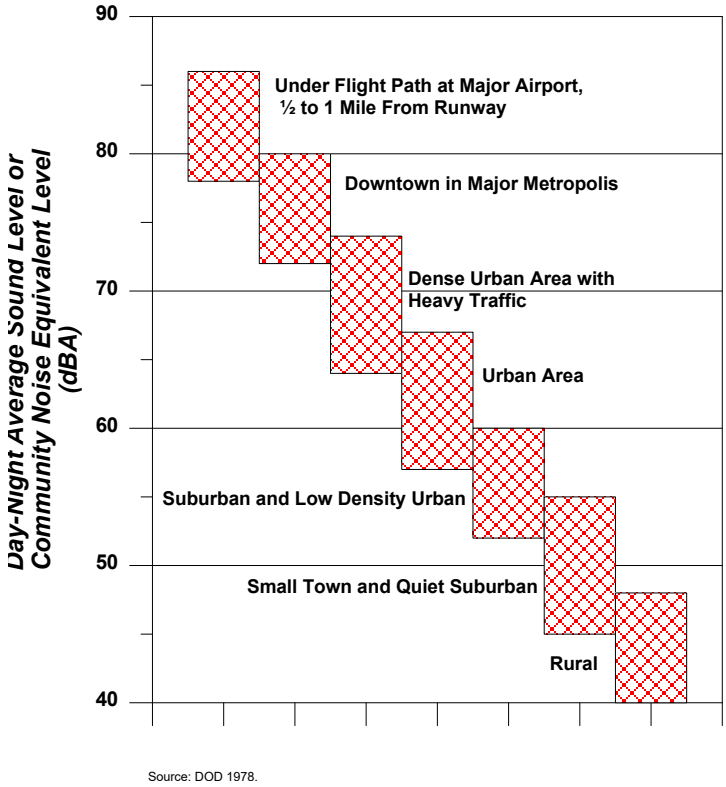
Source: Wyle Laboratories

Figure B-5. Example of $L_{eq}(24)$, DNL and CNEL Computed from Hourly Equivalent Sound Levels.

Figure B-6 shows the ranges of DNL or CNEL that occur in various types of communities. Under a flight path at a major airport the DNL may exceed 80 dB while rural areas may experience DNL less than 45 dB. The decibel summation nature of these metrics causes the noise levels of the loudest events to control the 24-hour average. As a simple example, consider a case in which only one aircraft overflight occurs during the daytime over a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.9 dB. Assume, as a second example that 10 such 30-second overflights occur during daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.5 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events.

A feature of the DNL metric is that a given DNL value could result from a very few noisy events or a large number of quieter events. For example, one overflight at 90 dB creates the same DNL as 10 overflights at 80 dB.

DNL or CNEL does not represent a level heard at any given time but represent long-term exposure. Scientific studies have found good correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL (Schultz, 1978; USEPA, 1978).



Source: DOD 1978.

Figure B-6. Typical DNL or CNEL Ranges in Various Types of Communities.

Onset-Rate Adjusted Monthly Day-Night Average Sound Level and Onset-Rate Adjusted Monthly Community Noise Equivalent Level

Military aircraft utilizing special use airspace such as Military Training Routes, Military Operations Areas, and restricted areas generate a noise environment that is somewhat different from that around airfields. Rather than regularly occurring operations like at airfields, activity in special use airspace is highly sporadic. It is often seasonal, ranging from 10 per hour to less than 1 per week. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset, with rates of up to 150 dB per second.

The cumulative daily noise metric devised to account for the "surprise" effect of the sudden onset of aircraft noise events on humans and the sporadic nature of special use airspace activity is the Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). Onset rates between 15 and 150 dB per second require an adjustment of 0 to 11 dB to the event's SEL while onset rates below 15 dB per second require no adjustment to the event's SEL (Stusnick et al., 1992). The term 'monthly' in L_{dnmr} refers to the noise assessment being conducted for the month with the most operations or sorties -- the so-called busiest month.

In California, a variant of the L_{dnmr} includes a penalty for evening operations (7:00 p.m. to 10:00 p.m.) and is denoted Onset-Rate Adjusted Monthly Community Noise Equivalent Level ($CNEL_{mr}$).

B.1.3.3 Supplemental Metrics

Number-of-Events Above a Threshold Level

The Number-of-Events Above (NA) metric gives the total number of events that exceed a noise level threshold (L) during a specified period of time. Combined with the selected threshold, the metric is denoted NAL. The threshold can be either SEL or L_{max}, and it is important that this selection is shown in the nomenclature. When labeling a contour line or point of interest, NAL is followed by the number of events in parentheses. For example, where 10 events exceed an SEL of 90 dB over a given period of time, the nomenclature would be NA90SEL(10). Similarly, for L_{max} it would be NA90L_{max}(10). The period of time can be an average 24-hour day, daytime, nighttime, school day, or any other time period appropriate to the nature and application of the analysis.

NA is a supplemental metric. It is not supported by the amount of science behind DNL/CNEL, but it is valuable in helping to describe noise to the community. A threshold level and metric are selected that best meet the need for each situation. An L_{max} threshold is normally selected to analyze speech interference, while an SEL threshold is normally selected for analysis of sleep disturbance.

The NA metric is the only supplemental metric that combines single-event noise levels with the number of aircraft operations. In essence, it answers the question of how many aircraft (or range of aircraft) fly over a given location or area at or above a selected threshold noise level.

Time Above a Specified Level

The Time Above (TA) metric is the total time, in minutes, that the A-weighted noise level is at or above a threshold. Combined with the threshold level (L), it is denoted TAL. TA can be calculated over a full 24-hour annual average day, the 15-hour daytime and 9-hour nighttime periods, a school day, or any other time period of interest, provided there is operational data for that time.

TA is a supplemental metric, used to help understand noise exposure. It is useful for describing the noise environment in schools, particularly when assessing classroom or other noise sensitive areas for various scenarios. TA can be shown as contours on a map similar to the way DNL contours are drawn.

TA helps describe the noise exposure of an individual event or many events occurring over a given time period. When computed for a full day, the TA can be compared alongside the DNL in order to determine the sound levels and total duration of events that contribute to the DNL. TA analysis is usually conducted along with NA analysis, so the results show not only how many events occur, but also the total duration of those events above the threshold.

B.1.4 Noise Effects

Noise is of concern because of potential adverse effects. The following subsections describe how noise can affect communities and the environment and how those effects are quantified. The specific topics discussed are

- annoyance;
- speech interference;
- sleep disturbance;
- noise effects on children; and
- noise effects on domestic animals and wildlife.

B.1.4.1 Annoyance

With the introduction of jet aircraft in the 1950s, it became clear that aircraft noise annoyed people and was a significant problem around airports. Early studies, such as those of Rosenblith et al. (1953) and Stevens et al. (1953) showed that effects depended on the quality of the sound, its level, and the number of flights.

Over the next 20 years considerable research was performed refining this understanding and setting guidelines for noise exposure. In the early 1970s, the USEPA published its "Levels Document" (USEPA, 1974) that reviewed the factors that affected communities. DNL (still known as L_{dn} at the time) was identified as an appropriate noise metric, and threshold criteria were recommended.

Threshold criteria for annoyance were identified from social surveys, where people exposed to noise were asked how noise affects them. Surveys provide direct real-world data on how noise affects actual residents.

Surveys in the early years had a range of designs and formats and needed some interpretation to find common ground. In 1978, Schultz showed that the common ground was the number of people "highly annoyed," defined as the upper 28 percent range of whatever response scale a survey used (Schultz, 1978). With that definition, he was able to show a remarkable consistency among the majority of the surveys for which data were available. **Figure B-7** shows the result of his study relating DNL to individual annoyance measured by percent highly annoyed (%HA).

Schultz's original synthesis included 161 data points. **Figure B-8** shows a comparison of the predicted response of the Schultz data set with an expanded set of 400 data points collected through 1989 (Finegold et al., 1994). The new form is the preferred form in the United States, endorsed by the Federal Interagency Committee on Aviation Noise (FICAN, 1997). Other forms have been proposed, such as that of Fidell and Silvati (2004) but have not gained widespread acceptance.

When the goodness of fit of the Schultz curve is examined, the correlation between groups of people is high, in the range of 85 to 90 percent; however, the correlation between individuals is much lower, at 50 percent or less. This is not surprising, given the personal differences between individuals. The surveys underlying the Schultz curve include results that show that annoyance to noise is also affected by nonacoustical factors. Newman and Beattie (1985) divided the nonacoustic factors into the emotional and physical variables shown in **Table B-1**.

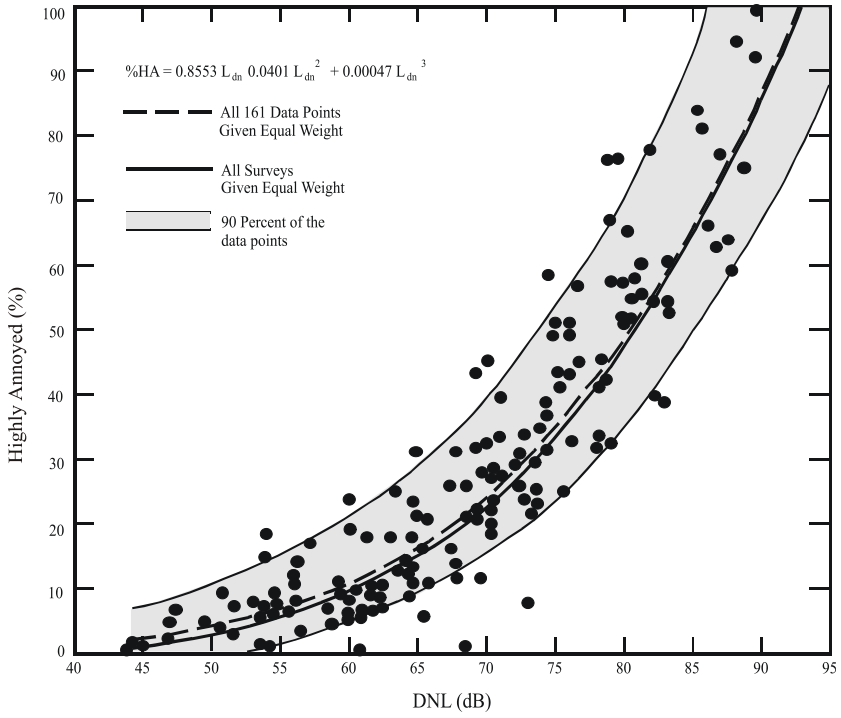


Figure B-7. Schultz Curve Relating Noise Annoyance to DNL (Schultz, 1978).

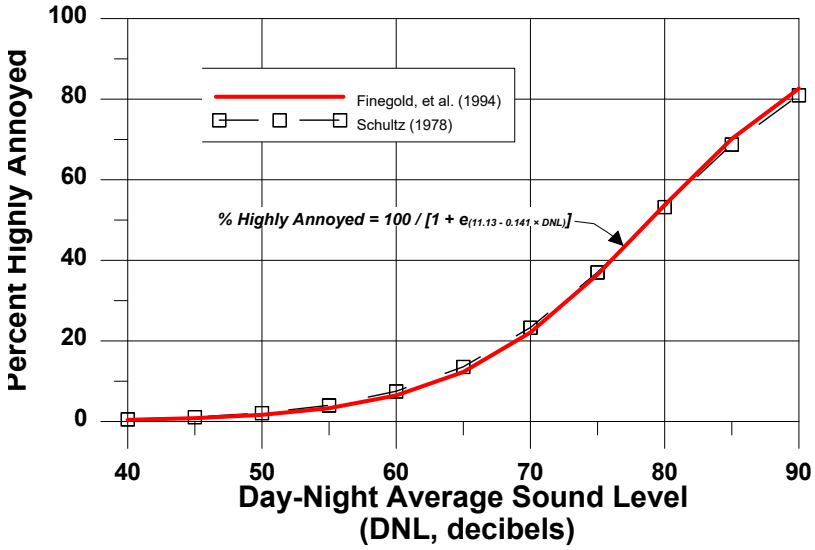


Figure B-8. Response of Communities to Noise; Comparison of Original Schultz (1978) with Finegold et al. (1994).

Table B-1
Nonacoustic Variables Influencing Aircraft Noise Annoyance

Emotional Variables
Feeling about the necessity or preventability of the noise
Judgement of the importance and value of the activity that is producing the noise
Activity at the time an individual hears the noise
Attitude about the environment
General sensitivity to noise
Belief about the effect of noise on health
Feeling of fear associated with the noise

Physical Variables
Type of neighborhood
Time of day
Season
Predictability of the noise
Control over the noise source
Length of time individual is exposed to a noise.

Schreckenberg and Schuemer (2010) examined the importance of some of these factors on short term annoyance. Attitudinal factors were identified as having an effect on annoyance. In formal regression analysis, however, sound level (L_{eq}) was found to be more important than attitude. A series of studies at three European airports showed that less than 20 percent of the variance in annoyance can be explained by noise alone (Márki, 2013).

A study by Plotkin et al. (2011) examined updating DNL to account for these factors. It was concluded that the data requirements for a general analysis were much greater than are available from most existing studies. It was noted that the most significant issue with DNL is that it is not readily understood by the public and that supplemental metrics such as TA and NA were valuable in addressing attitude when communicating noise analysis to communities (DOD, 2009a).

A factor that is partially nonacoustical is the source of the noise. Miedema and Vos (1998) presented synthesis curves for the relationship between DNL and percentage “Annoyed” and percentage “Highly Annoyed” for three transportation noise sources. Different curves were found for aircraft, road traffic, and railway noise. **Table B-2** summarizes their results. Comparing the updated Schultz curve suggests that the percentage of people highly annoyed by aircraft noise may be higher than previously thought. Miedema

and Oudshoorn (2001) authors supplemented that investigation with further derivation of percent of population highly annoyed as a function of either DNL or DENL along with the corresponding 95 percent confidence intervals with similar results.

Table B-2
Percent Highly Annoyed for Different Transportation Noise Sources

Day-Night Average Sound Level (decibels)	Percent Highly Annoyed (%HA)			
	Miedema and Vos			Schultz Combined
	Air	Road	Rail	
55	12	7	4	3
60	19	12	7	6
65	28	18	11	12
70	37	29	16	22
75	48	40	22	36

Source: Miedema and Vos, 1998

As noted by the World Health Organization (WHO), however, even though aircraft noise seems to produce a stronger annoyance response than road traffic, caution should be exercised when interpreting synthesized data from different studies (WHO, 1999).

Consistent with WHO's recommendations, the Federal Interagency Committee on Noise (FICON, 1992) considered the Schultz curve to be the best source of dose information to predict community response to noise but recommended further research to investigate the differences in perception of noise from different sources.

The International Standard (ISO 1996:1-2016) update introduced the concept of Community Tolerance Level (L_{ct}) as the day-night sound level at which 50 percent of the people in a particular community are predicted to be highly annoyed by noise exposure. L_{ct} accounts for differences between sources and/or communities when predicting the percentage highly annoyed by noise exposure. ISO also recommended a change to the adjustment range used when comparing aircraft noise to road noise. The previous edition suggested +3 to +6 dB for aircraft noise relative to road noise while the latest editions recommends an adjustment range of +5 to +8 dB. This adjustment range allows DNL to be correlated to consistent annoyance rates when originating from different noise sources (i.e., road traffic, aircraft, or railroad). This change to the adjustment range would increase the calculated percent highly annoyed at the 65-dBA DNL by approximately 2 to 5 percent greater than the previous ISO definition. **Figure B-9** depicts the estimated percentage of people highly annoyed for a given DNL using both the ISO 1996-1 estimation and the older FICON 1992 method. The results suggest that the percentage of people highly annoyed may be greater than previous thought and reliance solely on DNL for impact analysis may be insufficient if utilizing the FICON 1992 method.

The US Federal Aviation Administration (FAA) is currently conducting a major airport community noise survey at approximately 20 US airports in order to update the relationship between aircraft noise and annoyance. Results from this study are expected to be released in 2018.

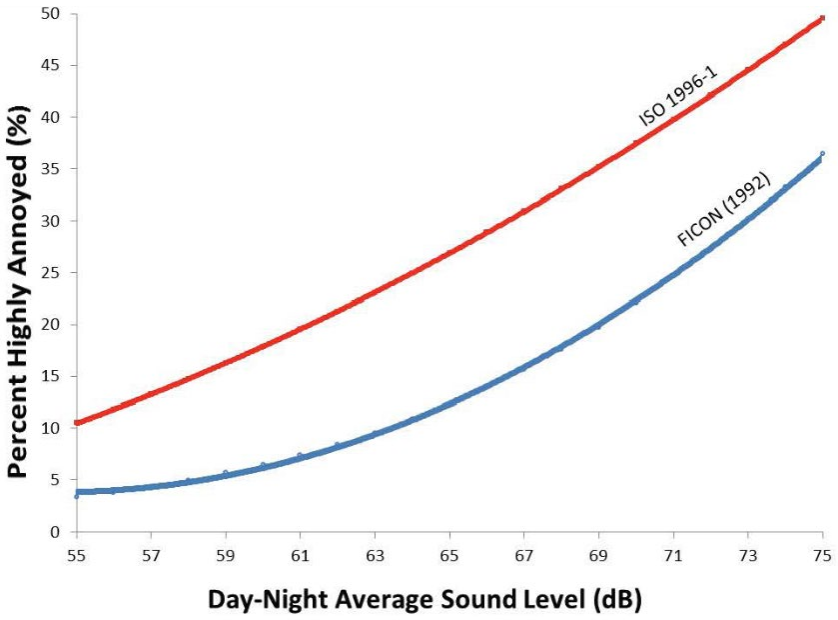


Figure B-9. Percent Highly Annoyed Comparison of ISO 1996-1 to FICON (1992).

B.1.4.2 Speech Interference

Speech interference from noise is a primary cause of annoyance for communities. Disruption of routine activities such as radio or television listening, telephone use, or conversation leads to frustration and annoyance. The quality of speech communication is important in classrooms and offices. In the workplace, speech interference from noise can cause fatigue and vocal strain in those who attempt to talk over the noise. In schools it can impair learning.

There are two measures of speech comprehension:

1. Word Intelligibility - the percent of words spoken and understood. This might be important for students in the lower grades who are learning the English language and particularly for students who have English as a Second Language.
2. Sentence Intelligibility – the percent of sentences spoken and understood. This might be important for high-school students and adults who are familiar with the language and who do not necessarily have to understand each word in order to understand sentences.

United States Federal Criteria for Interior Noise

In 1974, the USEPA identified a goal of an indoor $L_{eq}(24)$ of 45 dB to minimize speech interference based on sentence intelligibility and the presence of steady noise (USEPA, 1974). **Figure B-10** shows the effect of steady indoor background sound levels on sentence intelligibility. For an average adult with normal hearing and fluency in the language, steady background indoor sound levels of less than the 45-dB L_{eq} are expected to allow 100 percent sentence intelligibility.

The curve on **Figure B-10** shows 99 percent intelligibility at L_{eq} below 54 dB and less than 10 percent above 73 dB. Recalling that L_{eq} is dominated by louder noise events, the USEPA $L_{eq}(24)$ goal of 45 dB generally ensures that sentence intelligibility will be high most of the time.

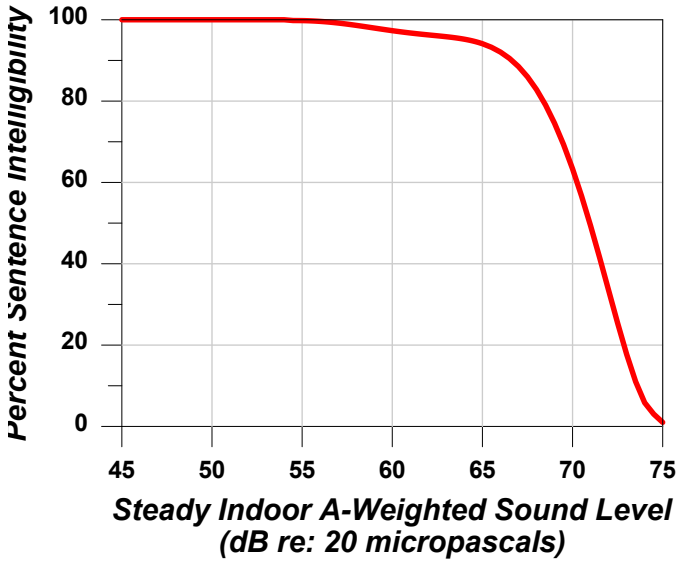


Figure B-10. Speech Intelligibility Curve (digitized from USEPA, 1974).

Classroom Criteria

For teachers to be understood, their regular voice must be clear and uninterrupted. Background noise has to be below the teacher's voice level. Intermittent noise events that momentarily drown out the teacher's voice need to be kept to a minimum. It is therefore important to evaluate the steady background level, level of voice communication, and single-event level due to aircraft overflights that might interfere with speech.

Lazarus (1990) found that for listeners with normal hearing and fluency in the language, complete sentence intelligibility can be achieved when the signal-to-noise ratio (i.e., a comparison of the level of the sound to the level of background noise) is in the range of 15 to 18 dB. The initial ANSI (2002) classroom noise standard and American Speech-Language-Hearing Association (2005) guidelines concur, recommending at least a 15-dB signal-to-noise ratio in classrooms. If the teacher's voice level is at least 50 dB, the background noise level must not exceed an average of 35 dB. The National Research Council of Canada (Bradley, 1993) and WHO (1999) agree with this criterion for background noise.

For eligibility for noise insulation funding, the FAA guidelines state that the design objective for a classroom environment is the 45-dB L_{eq} during normal school hours (FAA, 1985).

Most aircraft noise is not continuous. It consists of individual events like the one sketched on **Figure B-4**. Since speech interference in the presence of aircraft noise is caused by individual aircraft flyover events, a time-averaged metric alone, such as L_{eq}, is not necessarily appropriate. In addition to the background level criteria described above, single-event criteria that account for those noisy events are also needed.

A 1984 study by Wyle for the Port Authority of New York and New Jersey recommended using Speech Interference Level (SIL) for classroom noise criteria (Sharp and Plotkin, 1984). SIL is based on the maximum sound levels in the frequency range that most affects speech communication (500 to 2,000 Hz). The study identified an SIL of 45 dB as the goal. This would provide 90 percent word intelligibility for the short time periods during aircraft overflights. While SIL is technically the best metric for speech interference, it can be approximated by an L_{max} value. An SIL of 45 dB is equivalent to an A-weighted L_{max} of 50 dB for aircraft noise (Wesler, 1986).

Lind et al. (1998) also concluded that an L_{max} criterion of 50 dB would result in 90 percent word intelligibility. Bradley (1985) recommends SEL as a better indicator. His work indicates that 95 percent word intelligibility

would be achieved when indoor SEL did not exceed 60 dB. For typical flyover noise, this corresponds to an L_{max} of 50 dB. While WHO (1999) only specifies a background L_{max} criterion, they also note the SIL frequencies and that interference can begin at around 50 dB.

The United Kingdom Department for Education and Skills (UKDfES) established in its classroom acoustics guide a 30-minute time-averaged metric of L_{eq}(30min) for background levels and the metric of LA1,30min for intermittent noises, at thresholds of 30 to 35 dB and 55 dB, respectively. LA1,30min represents the A-weighted sound level that is exceeded 1 percent of the time (in this case, during a 30-minute teaching session) and is generally equivalent to the L_{max} metric (UKDfES, 2003).

Table B-3 summarizes the criteria discussed. Other than the FAA (1985) 45 dB L_{max} criterion, they are consistent with a limit on indoor background noise of 35 to 40 dB L_{eq} and a single event limit of 50 dB L_{max}. It should be noted that these limits were set based on students with normal hearing and no special needs. At-risk students may be adversely affected at lower sound levels.

Table B-3
Indoor Noise Level Criteria Based on Speech Intelligibility

Source	Metric/Level (dB)	Effects and Notes
Federal Aviation Administration (1985)	$L_{eq(during\ school\ hours)}$ = 45 dB	Federal assistance criteria for school sound insulation; supplemental single-event criteria may be used.
Lind et al. (1998), Sharp and Plotkin (1984), Wesler (1986)	L_{max} = 50 dB / Speech Interference Level 45	Single event level permissible in the classroom.
World Health Organization (1999)	L_{eq} = 35 dB L_{max} = 50 dB	Assumes average speech level of 50 dB and recommends signal to noise ratio of 15 dB.
American National Standards Institute (2010)	L_{eq} = 35 dB, based on Room Volume (e.g., cubic feet)	Acceptable background level for continuous and intermittent noise.
United Kingdom Department for Education and Skills (2003)	$L_{eq(30min)}$ = 30-35 dB L_{max} = 55 dB	Minimum acceptable in classroom and most other learning environs.

Notes:
dB = decibel(s); L_{eq} = Equivalent Sound Level; L_{max} = Maximum Sound Level

B.1.4.3 Sleep Disturbance

Sleep disturbance is a major concern for communities exposed to aircraft noise at night. A number of studies have attempted to quantify the effects of noise on sleep. This section provides an overview of the major noise-induced sleep disturbance studies. Emphasis is on studies that have influenced US federal noise policy. The studies have been separated into two groups:

1. Initial studies performed in the 1960s and 1970s, where the research was focused on sleep observations performed under laboratory conditions.
2. Later studies performed in the 1990s up to the present, where the research was focused on field observations.

Initial Studies

The relation between noise and sleep disturbance is complex and not fully understood. The disturbance depends not only on the depth of sleep and the noise level but also on the nonacoustic factors cited for annoyance. The easiest effect on measure is the number of arousals or awakenings from noise events.

Much of the literature has therefore focused on predicting the percentage of the population that will be awakened at various noise levels.

FICON's 1992 review of airport noise issues (FICON, 1992) included an overview of relevant research conducted through the 1970s. Literature reviews and analyses were conducted from 1978 through 1989 using existing data (Griefahn, 1978; Lukas, 1978; Pearsons et. al., 1989). Because of large variability in the data, FICON did not endorse the reliability of those results.

FICON did, however, recommend an interim dose-response curve, awaiting future research. That curve predicted the percent of the population expected to be awakened as a function of the exposure to SEL. This curve was based on research conducted for the US Air Force (Finegold, 1994). The data included most of the research performed up to that point and predicted a 10 percent probability of awakening when exposed to an interior SEL of 58 dB. The data used to derive this curve were primarily from controlled laboratory studies.

Recent Sleep Disturbance Research – Field and Laboratory Studies

It was noted that early sleep laboratory studies did not account for some important factors. These included habituation to the laboratory, previous exposure to noise, and awakenings from noise other than aircraft. In the early 1990s, field studies in people's homes were conducted to validate the earlier laboratory work conducted in the 1960s and 1970s. The field studies of the 1990s (e.g., Horne, 1994) found that 80 to 90 percent of sleep disturbances were not related to outdoor noise events but rather to indoor noises and nonnoise factors. The results showed that, in real life conditions, there was less of an effect of noise on sleep than had been previously reported from laboratory studies. Laboratory sleep studies tend to show more sleep disturbance than field studies because people who sleep in their own homes are used to their environment and, therefore, do not wake up as easily (FICAN, 1997).

FICAN

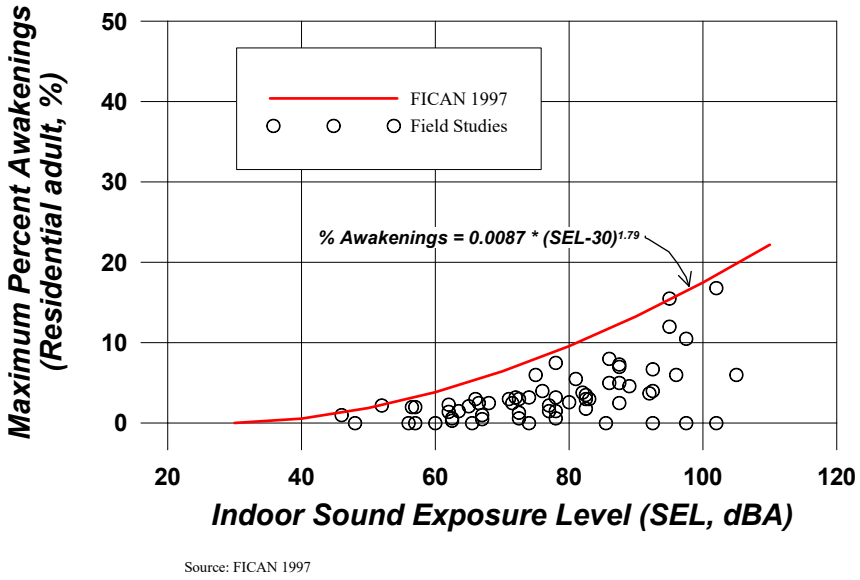
Based on this new information, in 1997 FICAN recommended a dose-response curve to use instead of the earlier 1992 FICON curve (FICAN, 1997). **Figure B-11** shows FICAN's curve, the red line, which is based on the results of three field studies shown in the figure (Ollerhead et al., 1992; Fidell et al., 1994, 1995a, 1995b), along with the data from six previous field studies.

The 1997 FICAN curve represents the upper envelope of the latest field data. It predicts the maximum percent awakened for a given residential population. According to this curve, a maximum of 3 percent of people would be awakened at an indoor SEL of 58 dB. An indoor SEL of 58 dB is equivalent to an outdoor SEL of about 83 dB, with the windows closed (73 dB with windows open).

Number of Events and Awakenings

It is reasonable to expect that sleep disturbance is affected by the number of events. The German Aerospace Center (DLR Laboratory) conducted an extensive study focused on the effects of nighttime aircraft noise on sleep and related factors (Basner, 2004). The DLR Laboratory study was one of the largest studies to examine the link between aircraft noise and sleep disturbance. It involved both laboratory and in-home field research phases. The DLR Laboratory investigators developed a dose-response curve that predicts the number of aircraft events at various values of L_{max} expected to produce one additional awakening over the course of a night. The dose-effect curve was based on the relationships found in the field studies.

Later studies by DLR Laboratory conducted in the laboratory comparing the probability of awakenings from different modes of transportation showed that aircraft noise lead to significantly lower awakening probabilities than either road or rail noise (Basner et al., 2011). Furthermore, it was noted that the probability of awakening, per noise event, decreased as the number of noise events increased. The authors concluded that by far the majority of awakenings from noise events merely replaced awakenings that would have occurred spontaneously anyway.



Source: FICAN 1997

Figure B-11. FICAN (1997) Recommended Sleep Disturbance Dose-Response Relationship.

A different approach was taken by an ANSI standards committee (ANSI, 2008). The committee used the average of the data shown on **Figure B-10** rather than the upper envelope, to predict average awakening from one event. Probability theory is then used to project the awakening from multiple noise events.

Currently, there are no established criteria for evaluating sleep disturbance from aircraft noise although recent studies have suggested a benchmark of an outdoor SEL of 90 dB as an appropriate tentative criterion when comparing the effects of different operational alternatives. The corresponding indoor SEL would be approximately 25 dB lower (at 65 dB) with doors and windows closed, and approximately 15 dB lower (at 75 dB) with doors or windows open. According to the ANSI (2008) standard, the probability of awakening from a single aircraft event at this level is between 1 and 2 percent for people habituated to the noise sleeping in bedrooms with windows closed, and between 2 to 3 percent with windows open. The probability of the exposed population awakening at least once from multiple aircraft events at the 90-dB SEL is shown in **Table B-4**.

Table B-4
Probability of Awakening from NA90SEL

Number of Aircraft Events at the 90-Decibel Sound Exposure Level for Average 9-Hour Night	Minimum Probability of Awakening at Least Once	
	Windows Closed	Windows Open
1	1%	2%
3	4%	6%
5	7%	10%
9 (1 per hour)	12%	18%
18 (2 per hour)	22%	33%
27 (3 per hour)	32%	45%

Source: DOD, 2009b

In December 2008, FICAN recommended the use of this new standard. FICAN also recognized that more research is underway by various organizations, and that work may result in changes to FICAN's position. Until that time, FICAN recommends the use of the ANSI (2008) standard (FICAN, 2008).

Summary

Sleep disturbance research still lacks the details to accurately estimate the population awakened for a given noise exposure. The procedure described in the ANSI (2008) Standard and endorsed by FICAN is based on probability calculations that have not yet been scientifically validated. While this procedure certainly provides a much better method for evaluating sleep awakenings from multiple aircraft noise events, the estimated probability of awakenings can only be considered approximate.

B.1.4.4 Noise Effects on Children

Recent studies on school children indicate a potential link between aircraft noise and both reading comprehension and learning motivation. The effects may be small but may be of particular concern for children who are already scholastically challenged.

Effects on Learning and Cognitive Abilities

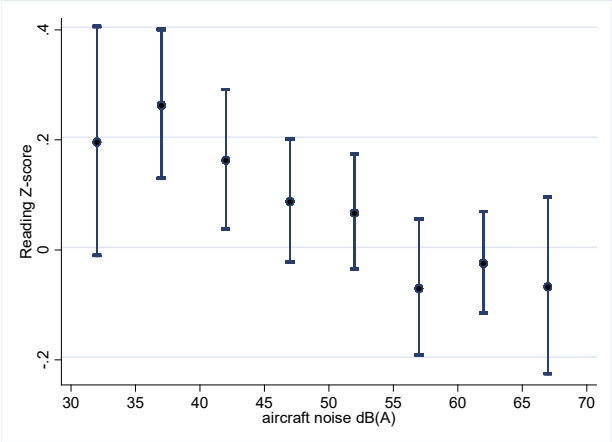
Early studies in several countries (Cohen et al., 1973, 1980, 1981; Bronzaft and McCarthy, 1975; Green et al., 1982; Evans et al., 1998; Haines et al., 2002; Lercher et al., 2003) showed lower reading scores for children living or attending school in noisy areas than for children away from those areas. In some studies noise exposed children were less likely to solve difficult puzzles or more likely to give up.

A longitudinal study reported by Evans et al. (1998), conducted prior to relocation of the old Munich airport in 1992, reported that high noise exposure was associated with deficits in long-term memory and reading comprehension in children with a mean age of 10.8 years. Two years after the closure of the airport, these deficits disappeared, indicating that noise effects on cognition may be reversible if exposure to the noise ceases. Most convincing was the finding that deficits in memory and reading comprehension developed over the 2-year follow-up for children who became newly noise exposed near the new airport; deficits were also observed in speech perception for the newly noise-exposed children.

More recently, the Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study (Stansfeld et al., 2005; Clark et al., 2005) compared the effect of aircraft and road traffic noise on over 2,000 children in three countries. This was the first study to derive exposure-effect associations for a range of cognitive and health effects and was the first to compare effects across countries.

The study found a linear relation between chronic aircraft noise exposure and impaired reading comprehension and recognition memory. No associations were found between chronic road traffic noise exposure and cognition. Conceptual recall and information recall surprisingly showed better performance in high road traffic noise areas. Neither aircraft noise nor road traffic noise affected attention or working memory (Stansfeld et al., 2005; Clark et al., 2006).

Figure B-12 shows RANCH's result relating noise to reading comprehension. It shows that reading falls below average (a z-score of 0) at Leq greater than 55 dB. Because the relationship is linear, reducing exposure at any level should lead to improvements in reading comprehension.



Sources: Stansfeld et al. 2005; Clark et al. 2006

Figure B-12. RANCH Study Reading Scores Varying with L_{eq}.

An observation of the RANCH study was that children may be exposed to aircraft noise for many of their childhood years and the consequences of long-term noise exposure were unknown. A follow-up study of the children in the RANCH project is being analyzed to examine the long-term effects on children's reading comprehension (Clark et al., 2009). Preliminary analysis indicated a trend for reading comprehension to be poorer at 15 to 16 years of age for children who attended noise-exposed primary schools. An additional study utilizing the same data set (Clark et al., 2012) investigated the effects of traffic-related air pollution and found little evidence that air pollution moderated the association of noise exposure on children's cognition.

There was also a trend for reading comprehension to be poorer in aircraft noise exposed secondary schools. Significant differences in reading scores were found between primary school children in the two different classrooms at the same school (Bronzaft and McCarthy, 1975). One classroom was exposed to high levels of railway noise while the other classroom was quiet. The mean reading age of the noise-exposed children was 3 to 4 months behind that of the control children. Studies suggest that the evidence of the effects of noise on children's cognition has grown stronger over recent years (Stansfeld and Clark, 2015), but further analysis adjusting for confounding factors is ongoing and needed to confirm these initial conclusions.

Studies identified a range of linguistic and cognitive factors to be responsible for children´s unique difficulties with speech perception in noise. Children have lower stored phonological knowledge to reconstruct degraded speech reducing the probability of successfully matching incomplete speech input when compared with adults. Additionally, young children are less able than older children and adults to make use of contextual cues to reconstruct noise-masked words presented in sentential context (Klatte et al., 2013).

FICAN funded a pilot study to assess the relationship between aircraft noise reduction and standardized test scores (Eagan et al., 2004; FICAN, 2007). The study evaluated whether abrupt aircraft noise reduction within classrooms, from either airport closure or sound insulation, was associated with improvements in test scores. Data were collected in 35 public schools near three airports in Illinois and Texas. The study used several noise metrics. These were, however, all computed indoor levels, which makes it hard to compare with the outdoor levels used in most other studies.

The FICAN study found a significant association between noise reduction and a decrease in failure rates for high school students but not middle or elementary school students. There were some weaker associations between noise reduction and an increase in failure rates for middle and elementary schools. Overall, the study found that the associations observed were similar for children with or without learning

difficulties, and between verbal and math/science tests. As a pilot study, it was not expected to obtain final answers but provided useful indications (FICAN, 2007).

A recent study of the effect of aircraft noise on student learning (Sharp et al., 2013) examined student test scores at a total of 6,198 US elementary schools, 917 of which were exposed to aircraft noise at 46 airports with noise exposures exceeding the 55-dBA DNL. The study found small but statistically significant associations between airport noise and student mathematics and reading test scores, after taking demographic and school factors into account. Associations were also observed for ambient noise and total noise on student mathematics and reading test scores, suggesting that noise levels per se, as well as from aircraft, might play a role in student achievement.

As part of the Noise-Related Annoyance, Cognition and Health study conducted at Frankfurt airport, reading tests were conducted on 1,209 school children at 29 primary schools. It was found that there was a small decrease in reading performance that corresponded to a 1-month reading delay; however, a recent study observing children at 11 schools surrounding Los Angeles International Airport found that the majority of distractions to elementary age students were other students followed by themselves, which includes playing with various items and daydreaming. Less than 1 percent of distractions were caused by traffic noise.

While there are many factors that can contribute to learning deficits in school-aged children, there is increasing awareness that chronic exposure to high aircraft noise levels may impair learning. This awareness has led WHO and a North Atlantic Treaty Organization (NATO) working group to conclude that daycare centers and schools should not be located near major sources of noise, such as highways, airports, and industrial sites (NATO, 2000; WHO, 1999). The awareness has also led to the classroom noise standard discussed earlier (ANSI, 2002).

B.1.4.5 Noise Effects on Animals and Wildlife

Hearing is critical to an animal's ability to react, compete, reproduce, hunt, forage, and survive in its environment. While the existing literature does include studies on possible effects of jet aircraft noise and sonic booms on wildlife, there appears to have been little concerted effort in developing quantitative comparisons of aircraft noise effects on normal auditory characteristics. Behavioral effects have been relatively well described, but the larger ecological context issues, and the potential for drawing conclusions regarding effects on populations, have not been well developed.

The relationships between potential auditory/physiological effects and species interactions with their environments are not well understood. Manci et al. (1988) assert that the consequences that physiological effects may have on behavioral patterns are vital to understanding the long-term effects of noise on wildlife. Questions regarding the effects (if any) on predator-prey interactions, reproductive success, and intraspecific behavior patterns remain.

The following discussion provides an overview of the existing literature on noise effects (particularly jet aircraft noise) on animal species. The literature reviewed here involves those studies that have focused on the observations of the behavioral effects that jet aircraft and sonic booms have on animals.

A great deal of research was conducted in the 1960s and 1970s on the effects of aircraft noise on the public and the potential for adverse ecological impacts. These studies were largely completed in response to the increase in air travel and as a result of the introduction of supersonic jet aircraft. According to Manci et al. (1988), the foundation of information created from that focus does not necessarily correlate or provide information specific to the impacts on wildlife in areas overflown by aircraft at supersonic speed or at low altitudes.

The abilities to hear sounds and noise and to communicate assist wildlife in maintaining group cohesiveness and survivorship. Social species communicate by transmitting calls of warning, introduction, and other types that are subsequently related to an individual's or group's responsiveness.

Animal species differ greatly in their responses to noise. Noise effects on domestic animals and wildlife are classified as primary, secondary, and tertiary. Primary effects are direct, physiological changes to the auditory system and most likely include the masking of auditory signals. Masking is defined as the inability of an individual to hear important environmental signals that may arise from mates, predators, or prey. There is some potential that noise could disrupt a species' ability to communicate or could interfere with behavioral patterns (Manci et al., 1988). Although the effects are likely temporal, aircraft noise may cause masking of auditory signals within exposed faunal communities. Animals rely on hearing to avoid predators, obtain food, and communicate with, and attract, other members of their species. Aircraft noise may mask or interfere with these functions. Other primary effects, such as ear drum rupture or temporary and permanent hearing threshold shifts, are not as likely given the subsonic noise levels produced by aircraft overflights.

Secondary effects may include nonauditory effects such as stress and hypertension; behavioral modifications; interference with mating or reproduction; and impaired ability to obtain adequate food, cover, or water. Tertiary effects are the direct result of primary and secondary effects and include population decline and habitat loss. Most of the effects of noise are mild enough that they may never be detectable as variables of change in population size or population growth against the background of normal variation (Bowles, 1995). Other environmental variables (e.g., predators, weather, changing prey base, ground-based disturbance) also influence secondary and tertiary effects and confound the ability to identify the ultimate factor in limiting productivity of a certain nest, area, or region (Smith et al., 1988). Overall, the literature suggests that species differ in their response to various types, durations, and sources of noise (Manci et al., 1988).

Many scientific studies have investigated the effects of aircraft noise on wildlife, and some have focused on wildlife "flight" due to noise. Animal responses to aircraft are influenced by many variables, including size, speed, proximity (both height above the ground and lateral distance), engine noise, color, flight profile, and radiated noise. The type of aircraft (e.g., fixed wing versus rotor-wing [helicopter]) and type of flight mission may also produce different levels of disturbance, with varying animal responses (Smith et al., 1988). Consequently, it is difficult to generalize animal responses to noise disturbances across species.

One result of the Manci et al. (1988) literature review was the conclusion that, while behavioral observation studies were relatively limited, a general behavioral reaction in animals from exposure to aircraft noise is the startle response. The intensity and duration of the startle response appears to be dependent on which species is exposed, whether there is a group or an individual, and whether there have been some previous exposures. Responses range from flight, trampling, stampeding, jumping, or running, to movement of the head in the apparent direction of the noise source. Manci et al. (1988) reported that the literature indicated that avian species may be more sensitive to aircraft noise than mammals.

Domestic Animals

Although some studies report that the effects of aircraft noise on domestic animals is inconclusive, a majority of the literature reviewed indicates that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbances over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90 dB, with responses including the startle response, freezing (i.e., becoming temporarily stationary), and fleeing from the sound source. Many studies on domestic animals suggest that some species appear to acclimate to some forms of sound disturbance (Manci et al., 1988). Some studies have reported such primary and secondary effects as reduced milk production and rate of milk release, increased glucose concentrations, decreased levels of hemoglobin, increased heart rate, and a reduction in thyroid activity. These latter effects appear to represent a small percentage of the findings occurring in the existing literature.

Some reviewers have indicated that earlier studies, and claims by farmers linking adverse effects of aircraft noise on livestock, did not necessarily provide clear-cut evidence of cause and effect (Cottereau, 1978). In contrast, many studies conclude that there is no evidence that aircraft overflights affect feed intake, growth, or production rates in domestic animals.

Wildlife

Studies on the effects of overflights and sonic booms on wildlife have been focused mostly on avian species and ungulates such as caribou and bighorn sheep. Few studies have been conducted on marine mammals, small terrestrial mammals, reptiles, amphibians, and carnivorous mammals. Generally, species that live entirely below the surface of the water have also been ignored due to the fact they do not experience the same level of sound as terrestrial species (National Park Service, 1994). Wild ungulates appear to be much more sensitive to noise disturbance than domestic livestock. This may be due to previous exposure to disturbances. One common factor appears to be that low-altitude flyovers seem to be more disruptive in terrain where there is little cover (Manci et al., 1988).

Some physiological/behavioral responses such as increased hormonal production, increased heart rate, and reduction in milk production have been described in a small percentage of studies. A majority of the studies focusing on these types of effects have reported short-term or no effects.

The relationships between physiological effects and how species interact with their environments have not been thoroughly studied; therefore, the larger ecological context issues regarding physiological effects of jet aircraft noise (if any) and resulting behavioral pattern changes are not well understood.

Animal species exhibit a wide variety of responses to noise. It is therefore difficult to generalize animal responses to noise disturbances or to draw inferences across species, as reactions to jet aircraft noise appear to be species-specific. Consequently, some animal species may be more sensitive than other species and/or may exhibit different forms or intensities of behavioral responses. For instance, wood ducks appear to be more sensitive and more resistant to acclimation to jet aircraft noise than Canada geese in one study. Similarly, wild ungulates seem to be more easily disturbed than domestic animals.

The literature does suggest that common responses include the “startle” or “fright” response and, ultimately, habituation. It has been reported that the intensities and durations of the startle response decrease with the numbers and frequencies of exposures, suggesting no long-term adverse effects. The majority of the literature suggests that domestic animal species (e.g., cows, horses, chickens) and wildlife species exhibit adaptation, acclimation, and habituation after repeated exposure to jet aircraft noise and sonic booms.

Animal responses to aircraft noise appear to be somewhat dependent on, or influenced by, the size, shape, speed, proximity (vertical and horizontal), engine noise, color, and flight profile of planes. Helicopters also appear to induce greater intensities and durations of disturbance behavior as compared to fixed-wing aircraft. Some studies showed that animals that had been previously exposed to jet aircraft noise exhibited greater degrees of alarm and disturbance to other objects creating noise, such as boats, people, and objects blowing across the landscape. Other factors influencing response to jet aircraft noise may include wind direction, speed, and local air turbulence; landscape structures (i.e., amount and type of vegetative cover); and, in the case of bird species, whether the animals are in the incubation/nesting phase.

B.1.5 References

American Speech-Language-Hearing Association. 2005. *Guidelines for Addressing Acoustics in Educational Settings, ASHA Working Group on Classroom Acoustics*.

ANSI. 1985. *Specification for Sound Level Meters, ANSI S1.4A-1985 Amendment to ANSI S1.4-1983*.

ANSI. 1988. *Quantities and Procedures for Description and Measurement of Environmental Sound: Part 1, ANSI S12.9-1988*.

ANSI. 1996. *Quantities and Procedures for Description and Measurement of Environmental Sound: Part 4, ANSI S12.9-1996*.

ANSI. 2002. *Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, ANSI S12.60-2002*.

ANSI. 2008. *Methods for Estimation of Awakenings with Outdoor Noise Events Heard in Homes, ANSI S12.9-2008/Part6*.

Austin, Jr., O.L., W.B. Robertson, Jr., and G.E. Wolfenden. 1970. *Mass Hatching Failure in Dry Tortugas Sooty Terns (Sterna fuscata)*. Proceedings of the XVth International Arnithological Congress, The Hague, The Netherlands. 30 August through 5 September.

Basner, M., W. Babisch, A. Davis, M. Brink, C. Clark, S. Janssess, et al. 2014. *Auditory and Non-auditory Effects of Noise on Health*. The Lancet 383(9925):1325-1332.

Basner, M., H. Buess, U. Miller, G. Platt, and A. Samuel. 2004. *Aircraft Noise Effects on Sleep: Final Results of DLR Laboratory and Field Studies of 2240 Polysomnographically Recorded Subject Nights*. Internoise 2004, The 33rd International Congress and Exposition on Noise Control Engineering. 22-25 August.

Basner M, U. Muller, and E.M. Elmenhorst. 2011. *Single and Combined Effects of Air, Road, and Rail Traffic Noise on Sleep and Recuperation*. Sleep 2011(34):11–23.

Berglund, B., and T. Lindvall, eds. 1995. *Community Noise*. Jannes Snabbtryck, Stockholm, Sweden.

Bowles, A.E. 1995. *Responses of Wildlife to Noise*, In *Wildlife and Recreationists: Coexistence through Management and Research*, R.L. Knight and K.J. Gutzwiller, eds. Island Press, Covelo, California, pp. 109-156.

Bradley J.S. 1985. *Uniform Derivation of Optimum Conditions for Speech in Rooms*. National Research Council, Building Research Note, BRN 239, Ottawa, Canada.

Bradley, J.S. 1993. *NRC-CNRC NEF Validation Study: Review of Aircraft Noise and its Effects*. National Research Council Canada and Transport Canada, Contract Report A-1505.5.

Bronzaft, A.L., and D.P. McCarthy. 1975. *The effects of elevated train noise on reading ability*. Journal of Environment and Behavior 7:517-527.

Clark, C., Crombie, R., Head, J., van Kamp, I., van Kempen, E., and Stansfeld, S. A. 2012. *Does Traffic-Related Air Pollution Explain Associations of Aircraft and Road Traffic Noise Exposure on Children's Health and Cognition? A Secondary Analysis of the United Kingdom Sample from the RANCH Project*. American Journal of Epidemiology 176(4):327–337.

Clark, C., R. Martin, E. van Kempen, T. Alfred, J. Head, H.W. Davies, M.M. Haines, I.L. Barrio, M. Matheson, and S.A. Stansfeld. 2005. *Exposure-Effect Relations Between Aircraft and Road Traffic Noise Exposure at School and Reading Comprehension: the RANCH Project*. American Journal of Epidemiology 163:27-37.

Clark, C., S.A. Stansfeld, and J. Head. 2009. *The Long-Term Effects of Aircraft Noise Exposure on Children's Cognition: Findings from the UK RANCH Follow-Up Study*. In Proceedings of the Euronoise Conference. Edinburgh, Scotland. October.

Cohen, S., D.C. Glass, and J.E. Singer. 1973. *Apartment Noise, Auditory Discrimination, and Reading Ability in Children*. Journal of Experimental Social Psychology 9:407-422.

Cohen, S., G.W. Evans, D.S. Krantz, et al. 1980. *Physiological, Motivational, and Cognitive Effects of Aircraft Noise on Children: Moving from Laboratory to Field*. American Psychologist 35:231-243.

Cohen, S., G.W. Evans, D.S. Krantz, et al. 1981. *Aircraft Noise and Children: Longitudinal and Cross-sectional Evidence on Adaptation to Noise and the Effectiveness of Noise Abatement.* Journal of Personality and Social Psychology 40:331-345.

Cottereau, P. 1978. *The Effect of Sonic Boom from Aircraft on Wildlife and Animal Husbandry*, In *Effects of Noise on Wildlife*, Academic Press, New York, New York, pp. 63-79.

DOD. 2009a. *Improving Aviation Noise Planning, Analysis, and Public Communication with Supplemental Metrics*. Defense Noise Working Group Technical Bulletin. December.

DOD. 2009b. *Sleep Disturbance from Aviation Noise*. Defense Noise Working Group Technical Bulletin. November.

Eagan, M.E., G. Anderson, B. Nicholas, R. Horonjeff, and T. Tivnan. 2004. *Relation Between Aircraft Noise Reduction in Schools and Standardized Test Scores*. Washington, DC, FICAN.

Evans, G.W., M. Bullinger, and S. Hygge. 1998. *Chronic Noise Exposure and Physiological Response: A Prospective Study of Children Living Under Environmental Stress*. Psychological Science 9:75-77.

FAA. 1985. *Airport Improvement Program (AIP) Handbook*. Order No. 100.38.

FICAN. 1997. *Effects of Aviation Noise on Awakenings from Sleep*. June.

FICAN. 2007. *Findings of the FICAN Pilot Study on the Relationship Between Aircraft Noise Reduction and Changes in Standardised Test Scores*. Washington, DC, FICAN.

FICAN. 2008. *FICAN Recommendation for Use of ANSI Standard to Predict Awakenings from Aircraft Noise*. December.

FICON. 1992. *Federal Agency Review of Selected Airport Noise Analysis Issues*. August.

Fidell, S., and L. Silvati. 2004. *Parsimonious Alternatives to Regression Analysis for Characterizing Prevalence Rates of Aircraft Noise Annoyance*. Noise Control Engineering Journal 52:56–68.

Fidell, S., K. Pearsons, R. Howe, B. Tabachnick, L. Silvati, and D.S. Barber. 1994. *Noise-Induced Sleep Disturbance in Residential Settings*. AL/OE-TR-1994-0131, Wright Patterson AFB, OH, Armstrong Laboratory, Occupational and Environmental Health Division.

Fidell, S., K. Pearsons, B. Tabachnick, R. Howe, L. Silvati, and D.S. Barber. 1995a. *Field Study of Noise-Induced Sleep Disturbance*. Journal of the Acoustical Society of America 98(2):1025-1033.

Fidell, S., R. Howe, B. Tabachnick, K. Pearsons, and M. Sneddon. 1995b. *Noise-induced Sleep Disturbance in Residences near Two Civil Airports*. NASA Contractor Report 198252.

Finegold, L.S., C.S. Harris, and H.E. von Gierke. 1994. *Community Annoyance and Sleep Disturbance: Updated Criteria for Assessing the Impact of General Transportation Noise on People*. Noise Control Engineering Journal 42(1):25-30.

Green, K.B., B.S. Pasternack, and R.E. Shore. 1982. *Effects of Aircraft Noise on Reading Ability of School-Age Children.* Archives of Environmental Health 37(1):24-31.

Griefahn, B. 1978. *Research on Noise Disturbed Sleep Since 1973*. Proceedings of Third International Congress on Noise as a Public Health Problem, pp. 377-390 (as appears in NRC-CNRC NEF Validation Study: (2) Review of Aircraft Noise and Its Effects, A-1505.1, p. 31).

Haines, M.M., S.A. Stansfeld, J. Head, and R.F.S. Job. 2002. *Multilevel modelling of aircraft noise on performance tests in schools around Heathrow Airport London*. Journal of Epidemiology and Community Health 56:139-144.

Horne, J.A., F.L. Pankhurst, L.A. Reyner, K. Hume, and I.D. Diamond. 1994. *A Field Study of Sleep Disturbance: Effects of Aircraft Noise and Other Factors on 5,742 Nights of Actimetrically Monitored Sleep in a Large Subject Sample*. American Sleep Disorders Association and Sleep Research Society: Sleep 17(2):146–195.

Klatte M., K. Bergström, T. Lachmann. 2013. *Does Noise Affect Learning? A Short Review on Noise Effects on Cognitive Performance in Children*. Frontiers in Psychology 4:578.

Lazarus H. 1990. *New Methods for Describing and Assessing Direct Speech Communication Under Disturbing Conditions*. Environment International 16:373-392.

Lercher, P., G.W. Evans, and M. Meis. 2003. *Ambient Noise and Cognitive Processes Among Primary School Children*. Journal of Environment and Behavior 35:725-735.

Lind S.J., K. Pearsons, and S. Fidell. 1998. *Sound Insulation Requirements for Mitigation of Aircraft Noise Impact on Highline School District Facilities*. Volume I, BBN Systems and Technologies, BBN Report No. 8240.

Lukas, J.S. 1978. *Noise and Sleep: A Literature Review and a Proposed Criterion for Assessing Effect*, In Daryl N. May, ed., *Handbook of Noise Assessment*, Van Nostrand Reinhold Company: New York, pp. 313-334.

Manci, K.M., D.N. Gladwin, R. Villella, and M.G Cavendish. 1988. *Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis*. US Fish and Wildlife Service National Ecology Research Center, Ft. Collins, Colorado, NERC-88/29. 88 pp.

Márki, Ferenc. 2013. *Outcomes of EU COSMA (Community Oriented Solutions to Minimise Aircraft Noise Annoyance) Project.* Budapest University of Technology and Economics, London. May.

Miedema, H M, and C G Oudshoorn. 2001. *Annoyance from Transportation Noise: Relationships with Exposure Metrics DNL and DENL and Their Confidence Intervals*. Environmental Health Perspectives 109.4:409–416.

Miedema, H.M., and H. Vos. 1998. *Exposure-response relationships for transportation noise*. Journal of the Acoustical Society of America 104(6):3432–3445. December.

National Park Service. 1994. *Report to Congress: Report on Effects of Aircraft Overflights on the National Park System*. Prepared Pursuant to Public Law 100-91, The National Parks Overflights Act of 1987. 12 September.

NATO. 2000. *The Effects of Noise from Weapons and Sonic Booms, and the Impact on Humans, Wildlife, Domestic Animals and Structures*. Final Report of the Working Group Study Follow-up Program to the Pilot Study on Aircraft Noise, Report No. 241. June.

Newman, J.S., and K.R. Beattie. 1985. *Aviation Noise Effects*. US Department of Transportation, Federal Aviation Administration Report No. FAA-EE-85-2.

Ollerhead, J.B., C.J. Jones, R.E. Cadoux, A. Woodley, B.J. Atkinson, J.A. Horne, F. Pankhurst, L. Reyner, K.I. Hume, F. Van, A. Watson, I.D. Diamond, P. Egger, D. Holmes, and J. McKean. 1992. *Report of a Field Study of Aircraft Noise and Sleep Disturbance*. Commissioned by the UK Department of Transport for the 36 UK Department of Safety, Environment and Engineering, London, England: Civil Aviation Authority. December.

Pearsons, K.S., D.S. Barber, and B.G. Tabachnick. 1989. *Analyses of the Predictability of Noise-Induced Sleep Disturbance*. US Air Force Report HSD-TR-89-029. October.

Plotkin, K.J., B.H. Sharp, T. Connor, R. Bassarab, I. Flindell, and D. Schreckenberg. 2011. *Updating and Supplementing the Day-Night Average Sound Level (DNL)*. Wyle Report 11-04, DOT/FAA/AEE/2011-03. June.

Rosenblith, W.A., K.N. Stevens, and Staff of Bolt, Beranek, and Newman. 1953. *Handbook of Acoustic Noise Control, Vol. 2, Noise and Man*. US Air Force Report WADC TR-52-204.

Schreckenberg, D. and R. Schuemer. 2010. *The Impact of Acoustical, Operational and Non-Auditory Factors on Short-Term Annoyance Due to Aircraft Noise*. 39th International Congress on Noise Control Engineering (Inter-Noise 2010), Noise and Sustainability, Lisbon, Portugal. 13 - 16 June 2010.

Schultz, T.J. 1978. *Synthesis of social surveys on noise annoyance*. Journal of the Acoustical Society of America 64(2):377-405. August.

Sharp, B., T. Connor, D. McLaughlin, C. Clark, S. Stansfeld and J. Hervey. 2013. *Assessing Aircraft Noise Conditions Affecting Student Learning*, ACRP Web Document 16, http://www.trb.org/Aviation1/Blurbs/170328.aspx Airport Cooperative Research Program, Transportation Research Board, Washington, DC.

Sharp, B.H., and K.J. Plotkin. 1984. *Selection of Noise Criteria for School Classrooms*. Wyle Research Technical Note TN 84-2 for the Port Authority of New York and New Jersey. October.

Smith, D.G., D.H. Ellis, and T.H. Johnston. 1988. *Raptors and Aircraft*, In R.L Glinski, B. Gron-Pendelton, M.B. Moss, M.N. LeFranc, Jr., B.A. Millsap, and S.W. Hoffman, eds., Proceedings of the Southwest Raptor Management Symposium, National Wildlife Federation, Washington, DC, pp. 360-367.

Stansfeld, S.A., B. Berglund, and C. Clark, I. Lopez-Barrio, P. Fischer, E. Öhrström, M.M. Haines, J. Head, S. Hygge, and I. van Kamp, B.F. Berry, on behalf of the RANCH study team. 2005. *Aircraft and Road Traffic Noise and Children's Cognition and Health: A Cross-National Study*. Lancet 365:1942-1949.

Stansfeld, S.A. and C. Clark. 2015. *Health Effects of Noise Exposure in Children*. Current Environmental Health Reports 2(2):171-178.

Stevens, K.N., W.A. Rosenblith, and R.H. Bolt. 1953. *Neighborhood Reaction to Noise: A Survey and Correlation of Case Histories (A).* Journal of the Acoustical Society of America 25:833.

Stusnick, E., K.A. Bradley, J.A. Molino, and G. DeMiranda. 1992. *The Effect of Onset Rate on Aircraft Noise Annoyance, Volume 2: Rented Home Experiment*. Wyle Laboratories Research Report WR 92-3. March.

UKDfES. 2003. *Building Bulletin 93, Acoustic Design of Schools - A Design Guide*. London: The Stationary Office.

USEPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. USEPA Report 550/9-74-004. March.

USEPA. 1978. *Protective Noise Levels*. Office of Noise Abatement and Control, Washington, DC. USEPA Report 550/9-79-100. November.

Wesler, J.E. 1986. *Priority Selection of Schools for Soundproofing*. Wyle Research Technical Note TN 96-8 for the Port Authority of New York and New Jersey. October.

WHO. 1999. *Guidelines for Community Noise*. Berglund, B., T. Lindvall, and D. Schwela, eds.

Wyle Laboratories. 1970. *Supporting Information for the Adopted Noise Regulations for California Airports*. Wyle Report WCR 70-3(R).

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Appendix B-2

Noise Modeling

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B.1 NOISE MODELING

The following sections describe input data used in the noise modeling process. This data were developed in coordination with the Air Force Air Combat Command (ACC), Air Force Civil Engineer Center (AFCEC), and Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) personnel.

B.1.1 Airfield Operations

The first step in estimating the effects of the adversary air (ADAIR) contracting action was to determine the baseline operations at JBLE-Langley. The baseline operations are taken directly from a recently completed environmental assessment. The operations of the aircraft (where and how they fly) are taken from an AICUZ study in 2016. While the AICUZ was not published, it is the best source of information for the details of aircraft operations at JBLE-Langley.

There are 42,011 aircraft operations at JBLE-Langley. This total is the sum of 39,811 based aircraft operations and 2,200 transient aircraft operations. **Table B-5** contains these baseline operations.

The ADAIR operations are meant to follow the operations of F-22s of the 1st Fighter Wing and 192d Wing with allowance for proficiency and maintenance flights. The ADAIR sortie count of 4,100 includes 100 sorties for maintenance and flight proficiency for the ADAIR pilots. This entails the ADAIR aircraft being flown to the contractor's maintenance facility. **Table B-6** contains the operations to be modeled for the baseline as well as the additional ADAIR aircraft operations.

A SORTIE IS A SINGLE FLIGHT, BY ONE AIRCRAFT, FROM TAKEOFF TO LANDING, WHILE A SORTIE-OPERATION IS THE USE OF ONE AIRSPACE UNIT BY ONE AIRCRAFT. THE NUMBER OF SORTIE-OPERATIONS IS USED TO QUANTIFY THE NUMBER OF USES BY AIRCRAFT AND TO ACCURATELY MEASURE POTENTIAL IMPACTS; E.G. NOISE, AIR QUALITY, AND SAFETY IMPACTS. A SORTIE-OPERATION IS NOT A MEASURE OF HOW LONG AN AIRCRAFT USES AN AIRSPACE UNIT, NOR DOES IT INDICATE THE NUMBER OF AIRCRAFT IN AN AIRSPACE UNIT DURING A GIVEN PERIOD; IT IS A MEASUREMENT FOR THE NUMBER OF TIMES A SINGLE AIRCRAFT USES A PARTICULAR AIRSPACE UNIT.

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Table B-5
Baseline Operations at Joint Base Langley-Eustis, Langley Air Force Base

Aircraft Category		Aircraft Type	Modeled Aircraft Type (if different)	Engine (if necessary)	Departure						Arrival												Closed Pattern[1]												Totals		
					Standard / MIL			Afterburner / FCF			IFR / Straight-in			VFR: Non-Overhead			VFR: Overhead/Pitch-out			VFR: Tactical Overhead			VFR: Inside DW			VFR: Outside DW			VFR: Outside DW to Pitch-out			IFR					
					Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	**Day (0700-2200)**	**Night (2200-0700)**	**Total**
Based Military		F-22			7,221	73	7,294	264	-	264	1,738	151	1,889	-	-	-	1,418	-	1,418	4,251	-	4,251	6,718	-	6,718	-	-	-	843	-	843	-	-	-	22,453	224	22,677
		T-38A/B	T-38C		-	-	-	4,000	-	4,000	1,000	-	1,000	-	-	-	600	-	600	2,400	-	2,400	4,800	-	4,800	1,602	-	1,602	1,198	-	1,198	400	-	400	16,000	-	16,000
NASA		Turboprop	C-21A		561	6	567	-	-	-	58	-	58	503	6	509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,122	12	1,134
Military Transient	Fighter	F-15	F-15E	F100-PW-220	44	-	44	-	-	-	44	-	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88	-	88
		F-18	FA-18E/F		-	-	-	118	-	118	118	-	118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	236	-	236
		F-16	F-16C	F100-PW-220	132	-	132	-	-	-	132	-	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	264
		F-22			14	-	14	-	-	-	14	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	28
		F-35	F-35A		5	-	5	-	-	-	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	10
	Trainer	T-38	T-38C		-	-	-	66	-	66	66	-	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	132	-	132
		T-1			63	-	63	-	-	-	63	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	126	-	126
	Heavy Jet	C-5	C-5A		13	-	13	-	-	-	13	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	26
		C-17			95	-	95	-	-	-	95	-	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190	-	190
		KC-10A			8	-	8	-	-	-	8	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	16
		KC-135R			23	-	23	-	-	-	23	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	46
		E-3A			5	-	5	-	-	-	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	10
	Medium Jet	C-9 / B-737	C-9A and B-737QN(9)[2]		13	-	13	-	-	-	13	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	26
	Light Jet	C-21A			85	-	85	-	-	-	85	-	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170	-	170
		C-20			63	-	63	-	-	-	63	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	126	-	126
	Large Propeller	C-130J			106	-	106	-	-	-	106	-	106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	212	-	212
	Medium Propeller	C-12 / C-23	C-12 and C-23A [2]		176	30	206	-	-	-	131	15	146	45	15	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	352	60	412
	Helicopter	UH-1N			41	-	41	-	-	-	41	-	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82	-	82
Based Total					7,782	79	7,861	4,264	-	4,264	2,796	151	2,947	503	6	509	2,018	-	2,018	6,651	-	6,651	11,518	-	11,518	1,602	-	1,602	2,041	-	2,041	400	-	400	39,575	236	39,811
TransientTotal					886	30	916	184	-	184	1,025	15	1,040	45	15	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,140	60	2,200
Grand Total					**8,668**	**109**	**8,777**	**4,448**	**-**	**4,448**	**3,821**	**166**	**3,987**	**548**	**21**	**569**	**2,018**	**-**	**2,018**	**6,651**	**-**	**6,651**	**11,518**	**-**	**11,518**	**1,602**	**-**	**1,602**	**2,041**	**-**	**2,041**	**400**	**-**	**400**	**41,715**	**296**	**42,011**

Notes:
(1) Closed patterns consist of two operations, one departure and one arrival (e.g., two closed pattern circuits consist of four total operations). The table pattern numbers are operation counts not pattern circuit counts.
(2) Operations split equally among the two aircraft types

Table B-6
Baseline Training Operations at Joint Base Langley-Eustis, Langley Air Force Base Plus Contract Adversary Air Operations

Aircraft Category		Aircraft Type	Modeled Aircraft Type (if different)	Engine (if necessary)	Departure						Arrival												Closed Pattern[1]												Totals		
					Standard / MIL			Afterburner / FCF			IFR / Straight-in			VFR: Non-Overhead			VFR: Overhead/Pitch-out			VFR: Tactical Overhead			VFR: Inside DW			VFR: Outside DW			VFR: Outside DW to Pitch-out			IFR					
					Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	**Day (0700-2200)**	**Night (2200-0700)**	**Total**
Based Military		F-22			7,221	73	7,294	264	-	264	1,738	151	1,889	-	-	-	1,418	-	1,418	4,251	-	4,251	6,718	-	6,718	-	-	-	843	-	843	-	-	-	22,453	224	22,677
		T-38A/B	T-38C		-	-	-	4,000	-	4,000	1,000	-	1,000	-	-	-	600	-	600	2,400	-	2,400	4,800	-	4,800	1,602	-	1,602	1,198	-	1,198	400	-	400	16,000	-	16,000
NASA		Turboprop	C-21A		561	6	567	-	-	-	58	-	58	503	6	509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,122	12	1,134
ADAIR		Category C	see note 3		-	-	-	3,977	123	4,100	1,210	123	1,333	-	-	-	691	-	691	2,076	-	2,076	738	-	738	-	-	-	369	-	369	-	-	-	9,061	246	9,307
Military Transient	Fighter	F-15	F-15E	F100-PW-220	44	-	44	-	-	-	44	-	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88	-	88
		F-18	FA-18E/F		-	-	-	118	-	118	118	-	118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	236	-	236
		F-16	F-16C	F100-PW-220	132	-	132	-	-	-	132	-	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	264
		F-22			14	-	14	-	-	-	14	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	28
		F-35	F-35A		5	-	5	-	-	-	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	10
	Trainer	T-38	T-38C		-	-	-	66	-	66	66	-	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	132	-	132
		T-1			63	-	63	-	-	-	63	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	126	-	126
	Heavy Jet	C-5	C-5A		13	-	13	-	-	-	13	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	26
		C-17			95	-	95	-	-	-	95	-	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190	-	190
		KC-10A			8	-	8	-	-	-	8	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	16
		KC-135R			23	-	23	-	-	-	23	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	-	46
		E-3A			5	-	5	-	-	-	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	10
	Medium Jet	C-9 / B-737	C-9A and B-737QN(9)[2]		13	-	13	-	-	-	13	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	26
	Light Jet	C-21A			85	-	85	-	-	-	85	-	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170	-	170
		C-20			63	-	63	-	-	-	63	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	126	-	126
	Large Propeller	C-130J			106	-	106	-	-	-	106	-	106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	212	-	212
	Medium Propeller	C-12 / C-23	C-12 and C-23A [2]		176	30	206	-	-	-	131	15	146	45	15	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	352	60	412
	Helicopter	UH-1N			41	-	41	-	-	-	41	-	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82	-	82
Based Total					7,782	79	7,861	4,264	-	4,264	2,796	151	2,947	503	6	509	2,018	-	2,018	6,651	-	6,651	11,518	-	11,518	1,602	-	1,602	2,041	-	2,041	400	-	400	39,575	236	39,811
ADAIR Total					-	-	-	3,977	123	4,100	1,210	123	1,333	-	-	-	691	-	691	2,076	-	2,076	738	-	738	-	-	-	369	-	369	-	-	-	9,061	246	9,307
TransientTotal					886	30	916	184	-	184	1,025	15	1,040	45	15	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,140	60	2,200
Grand Total					**8,668**	**109**	**8,777**	**8,425**	**123**	**8,548**	**5,031**	**289**	**5,320**	**548**	**21**	**569**	**2,709**	**-**	**2,709**	**8,727**	**-**	**8,727**	**12,256**	**-**	**12,256**	**1,602**	**-**	**1,602**	**2,410**	**-**	**2,410**	**400**	**-**	**400**	**50,776**	**542**	**51,318**

Notes:
(1) Closed patterns consist of two operations, one departure and one arrival (e.g., two closed pattern circuits consist of four total operations). The table pattern numbers are operation counts not pattern circuit counts.
(2) Operations split equally among the two aircraft types.
(3) To be modeled as F18E/F, F16C, or F16A for High, Medium, and Low Noise Category C Proposed Action Scenarios, respectively; the 4,100 ADAIR departures (equivalent to sorties in this context) include up to 200 additional sorties for ADAIR pilots to maintain flight proficiency.

B.1.2 Runway and Flight Track Use

This section describes the flight tracks used by the aircraft operating out of JBLE-Langley as well as the runway utilization. Utilization percentages are provided for each runway in **Table B-7**. Flight track maps for all aircraft are presented on **Figure B-13** (departures), **Figure B-14** (arrivals), and **Figure B-15** (closed patterns).

Table B-7
Runway Usage for Based Aircraft at Joint Base Langley-Eustis, Langley Air Force Base

Operation Type	Runway ID	F-22	T-38C	C-21A	Civilian	Transient
Departure	08	60.00%	60.00%	60.49%	60.49%	50.00%
	26	40.00%	40.00%	39.51%	39.51%	50.00%
Closed Patterns	08	60.00%	60.00%	0.00%	0.00%	0.00%
	26	40.00%	40.00%	0.00%	0.00%	0.00%
Arrivals	08	60.00%	67.11%	51.85%	51.85%	50.00%
	26	40.00%	32.89%	48.15%	48.15%	50.00%

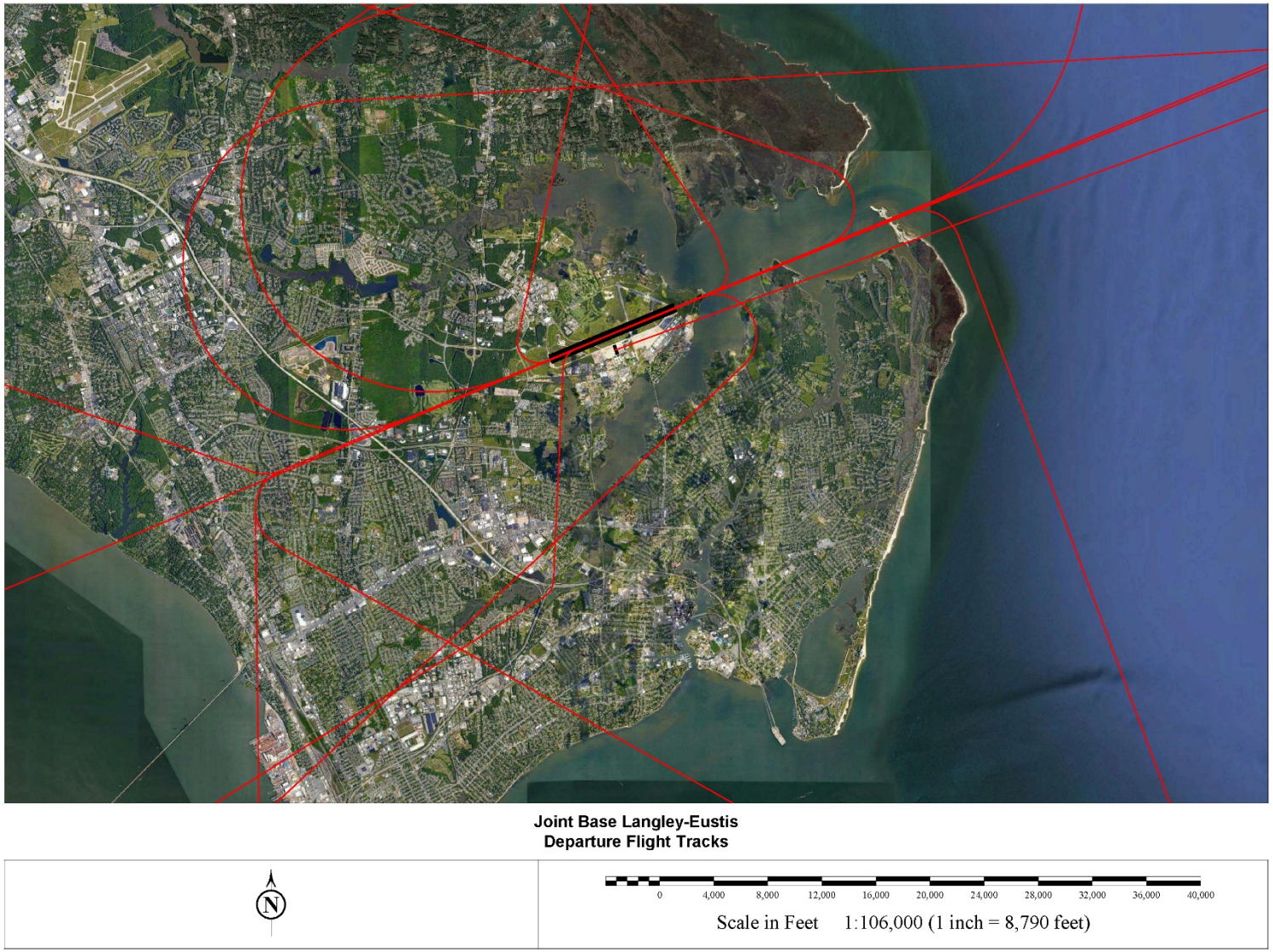


Figure B-13. Departure Flight Tracks at Joint Base Langley-Eustis, Langley Air Force Base.

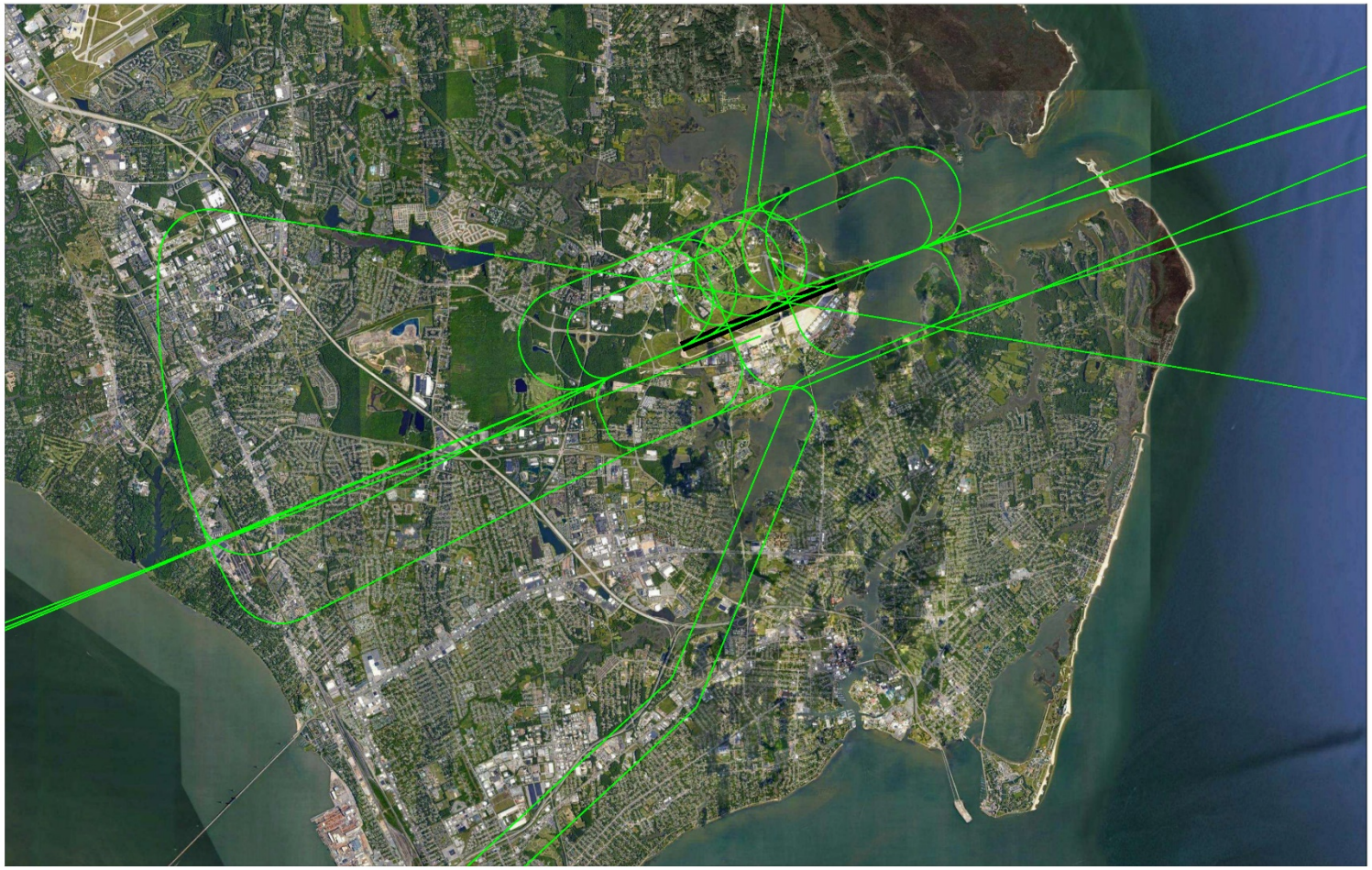


Figure B-14. Arrival Flight Tracks at Joint Base Langley-Eustis, Langley Air Force Base.

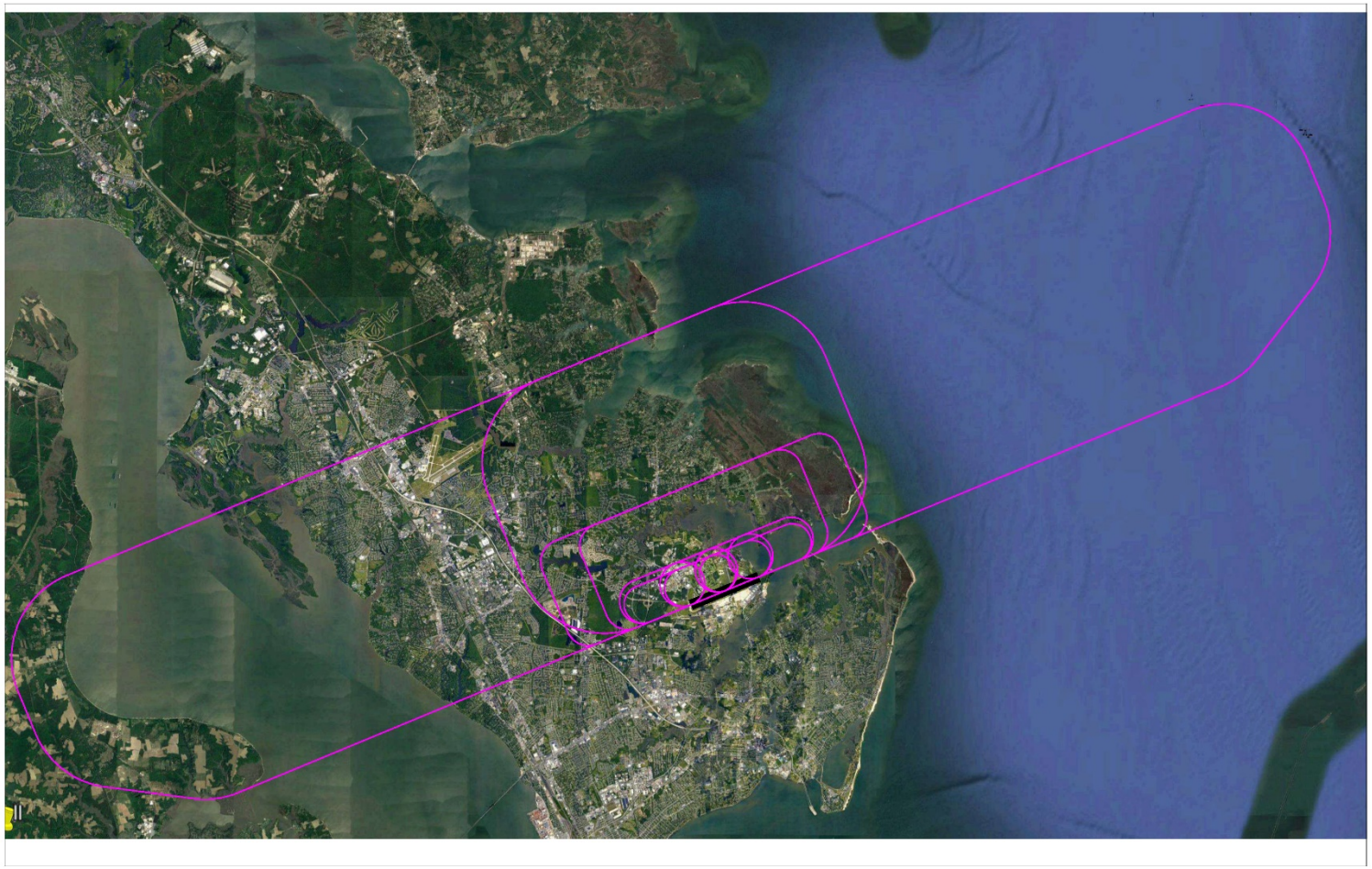


Figure B-15. Closed Pattern Flight Tracks at Joint Base Langley-Eustis, Langley Air Force Base.

B.1.3 Flight Profiles and Aircraft

This section details the representative profiles for the aircraft at JBLE-Langley that would be operating most frequently with ADAIR aircraft. This includes the F-22 and T-38C based aircraft. The ADAIR program is proposing to base contractor aircraft with the appropriate capabilities to respond to the needs of the fighters at the bases. There are three categories of aircraft with differing capabilities (A, B, and C). To fulfill the requirements of a category the contractor may provide a variety of aircraft with the appropriate specifications. Representative noise surrogates have been selected for the lowest through highest potential noise emission scenarios for the aircraft that contractors may select to provide for each of the categories. The surrogates selected for the different categories and scenarios are presented in **Table B-8**. To model a given noise scenario for a certain category, all ADAIR flight operations will be assigned to the surrogates. All three scenarios will be modeled separately in the final analysis.

Table B-8
Aircraft Scenarios

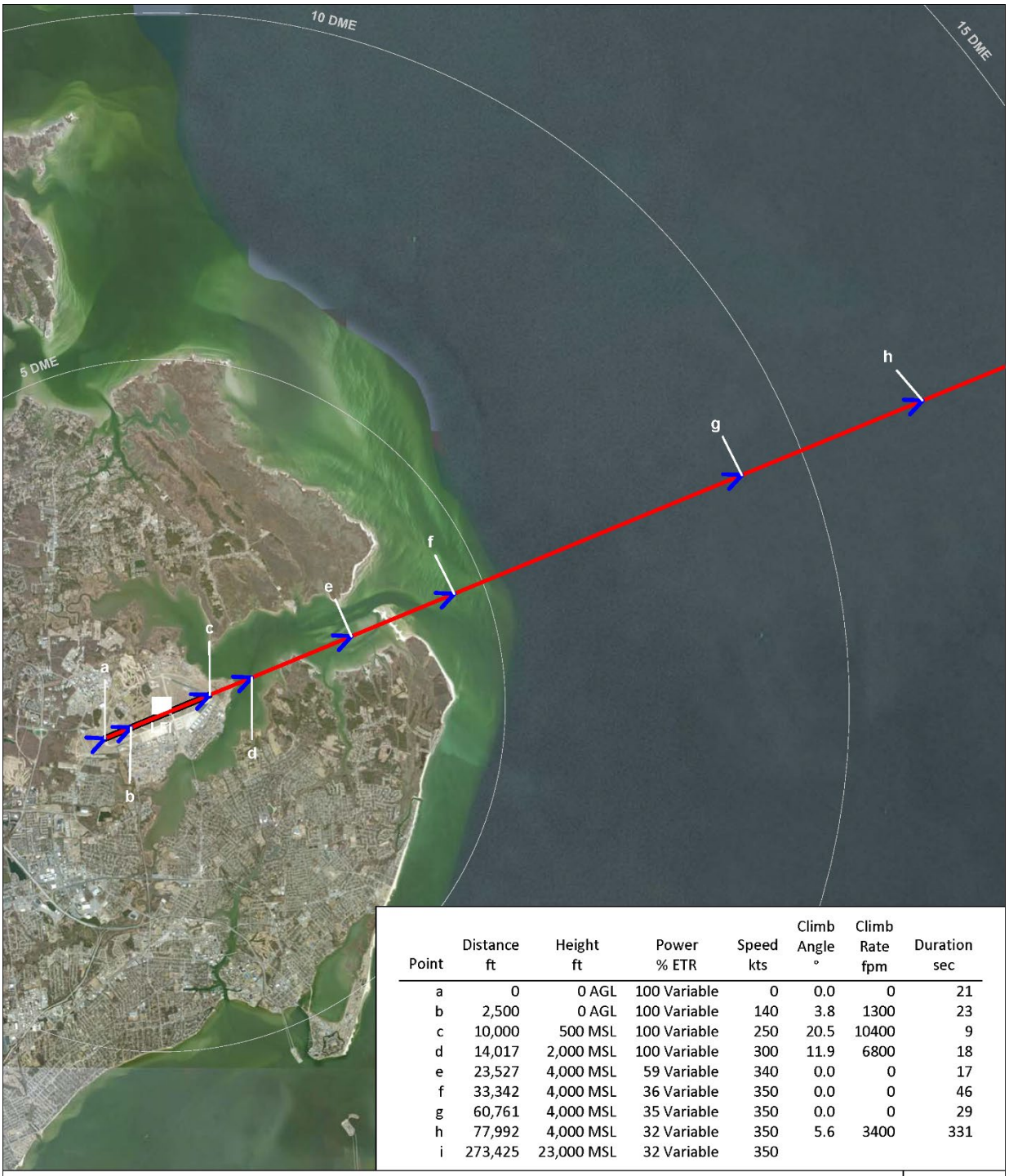
Category	High Noise Scenario	Medium Noise Scenario	Low Noise Scenario
A	A-4N (A-4C surrogate)	MiG-21 (F-104D&G surrogate)	L-59 (T-45 surrogate)
B	F-5 (F-5E surrogate)	A-4K (A-4C surrogate)	T-59 Hawk (T-45 surrogate)
C	Eurofighter Typhoon (F-18E/F surrogate)	Dassault Mirage (F-16C surrogate)	JAS 39 Gripen (F-16A surrogate)

The Category C aircraft were modeled as the F-16A for the low-noise scenario, the F-16C for the medium-noise scenario, and the F-18E/F for the high-noise scenario. Because it is unknown which aircraft type or combination thereof that the contractor would bring to JBLE-Langley, each scenario will be modeled separately as if it were the only aircraft in the ADAIR inventory.

Representative profiles provide the speed and power setting of each type of aircraft as a function of distance along the flight track for the representative maneuvers. For modeling purposes, the appropriate profile was used for all flight tracks that conform to that maneuver type. For example, all overhead break arrival tracks utilized the representative profile for modeling that maneuver. Any variation of a profile for a particular maneuver based on pilot interviews was made to the individual profile.

B.1.3.1 Based Aircraft Representative Flight Profiles

B.1.3.1.1 Flight Profiles for the F-22s

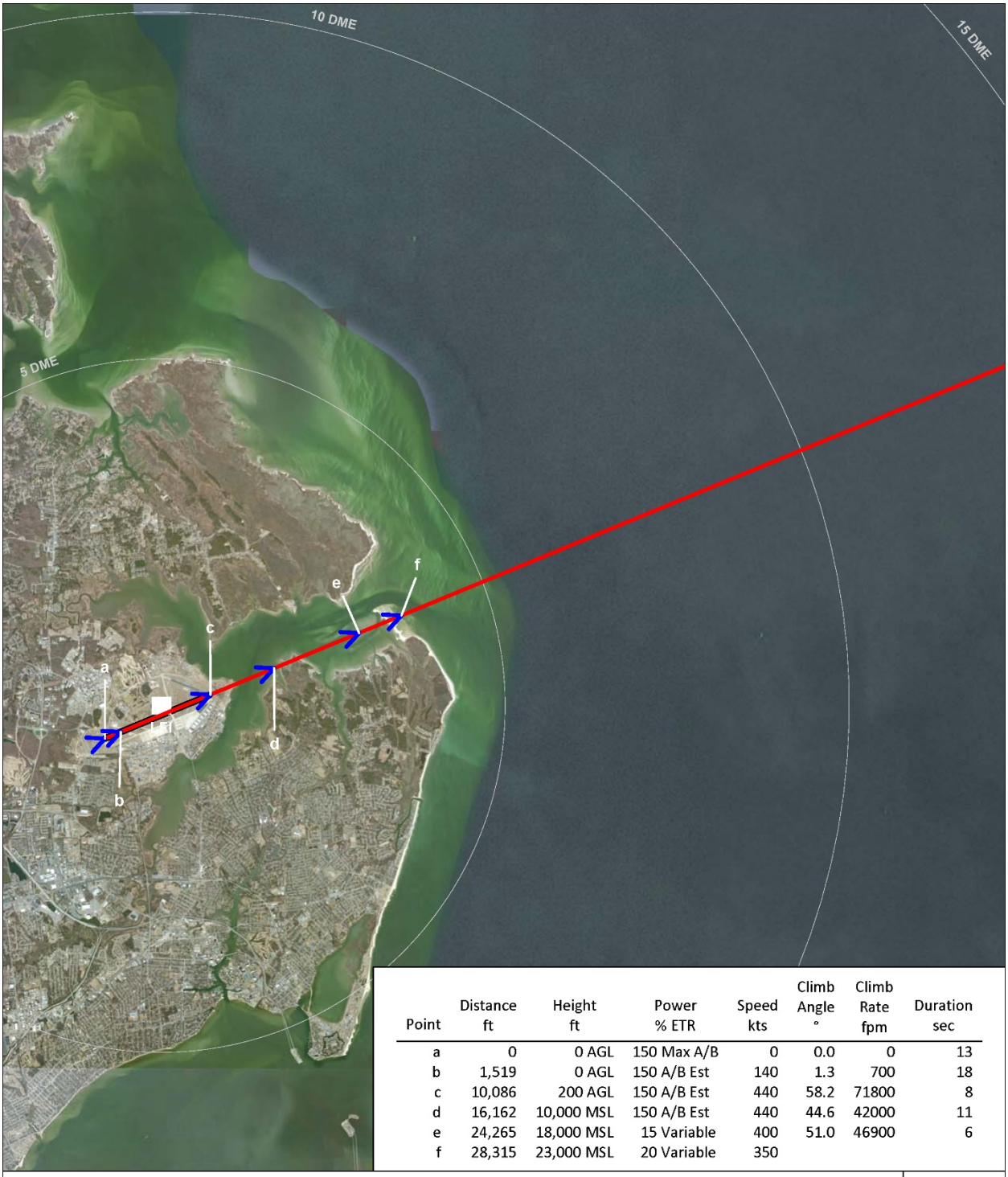


Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	100 Variable	0	0.0	0	21
b	2,500	0 AGL	100 Variable	140	3.8	1300	23
c	10,000	500 MSL	100 Variable	250	20.5	10400	9
d	14,017	2,000 MSL	100 Variable	300	11.9	6800	18
e	23,527	4,000 MSL	59 Variable	340	0.0	0	17
f	33,342	4,000 MSL	36 Variable	350	0.0	0	46
g	60,761	4,000 MSL	35 Variable	350	0.0	0	29
h	77,992	4,000 MSL	32 Variable	350	5.6	3400	331
i	273,425	23,000 MSL	32 Variable	350			

Flight Profile 001, MIL - W386
Based F-22
Flight Track: 08D01 - straight out IFR off runway 08

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:125,000 (1 inch = 10,400 feet)

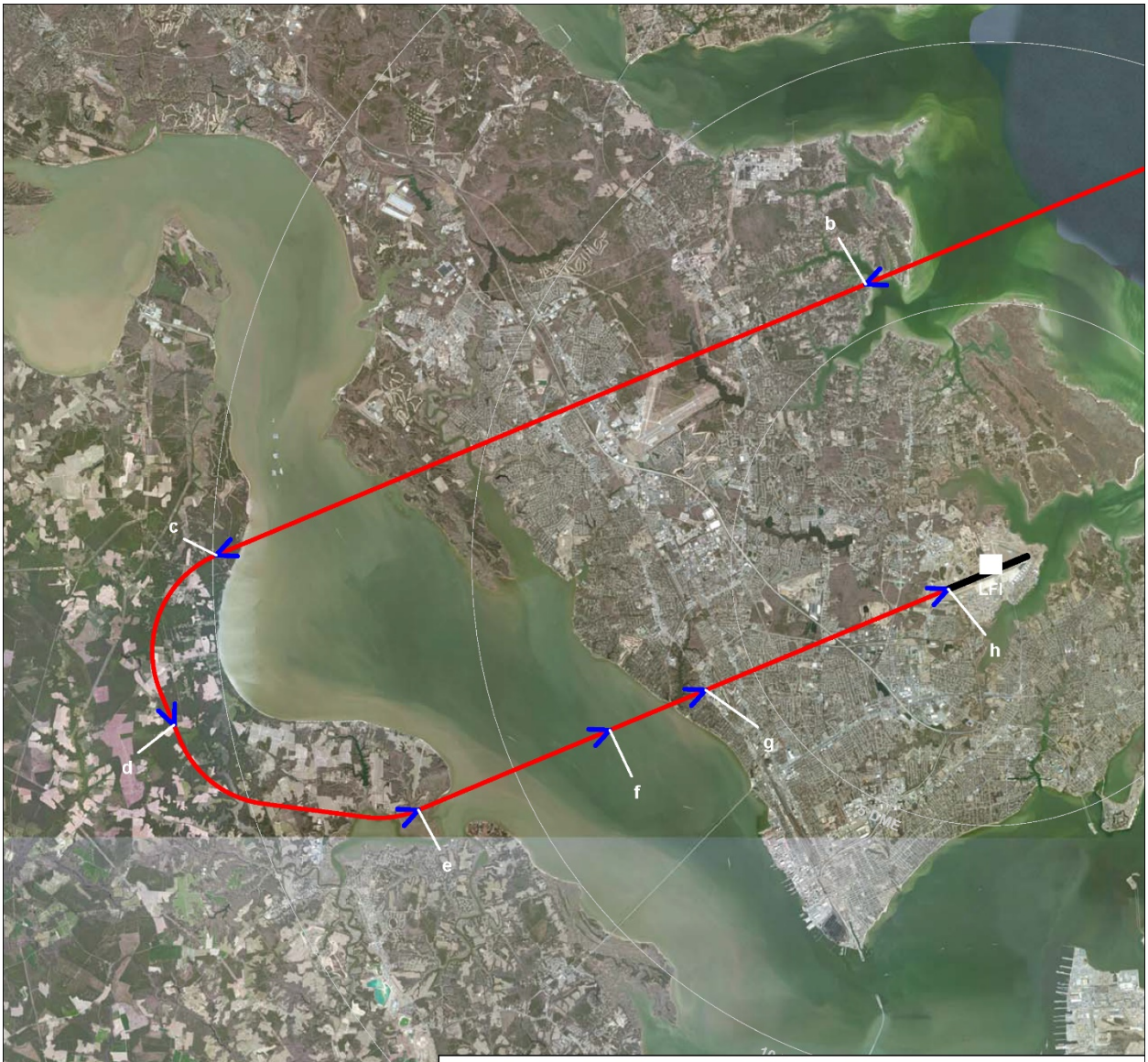


Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	150 Max A/B	0	0.0	0	13
b	1,519	0 AGL	150 A/B Est	140	1.3	700	18
c	10,086	200 AGL	150 A/B Est	440	58.2	71800	8
d	16,162	10,000 MSL	150 A/B Est	440	44.6	42000	11
e	24,265	18,000 MSL	15 Variable	400	51.0	46900	6
f	28,315	23,000 MSL	20 Variable	350			

Flight Profile 008, AB - W386
Based F-22
Flight Track: 08D01 - straight out IFR off runway 08

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:125,000 (1 inch = 10,400 feet)

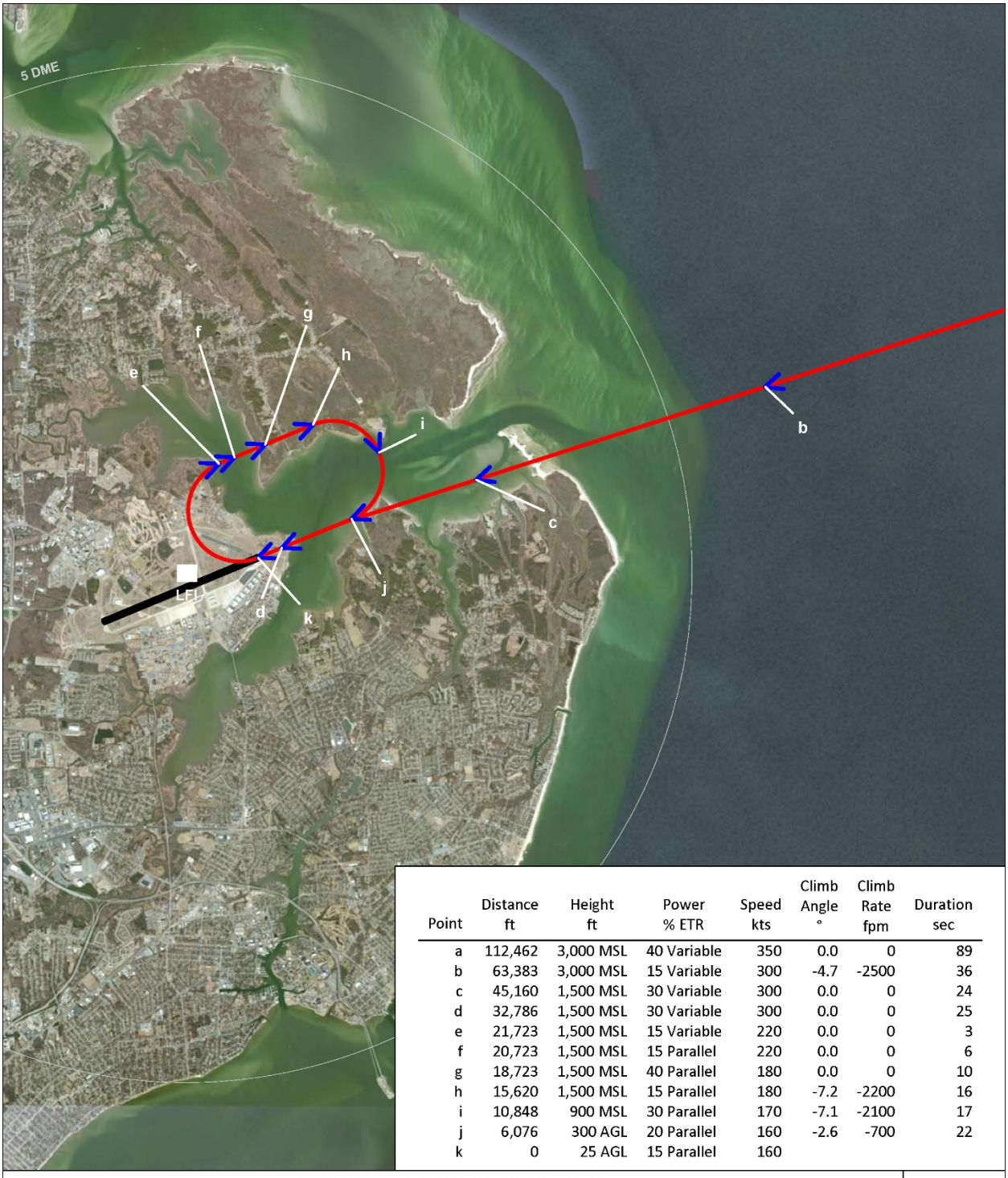


Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	335,800	6,000 MSL	40 Variable	250	-1.3	-600	308
b	205,932	3,000 MSL	40 Variable	250	0.0	0	195
c	123,616	3,000 MSL	25 Variable	250	-2.5	-1100	55
d	100,351	2,000 MSL	40 Variable	250	-0.3	-100	87
e	67,211	1,800 MSL	25 Variable	200	0.0	0	80
f	42,917	1,800 MSL	25 Variable	160	-0.9	-300	45
g	30,762	1,600 MSL	32 Approach	160	-2.9	-800	114
h	0	25 AGL	15 Approach	160			

Flight Profile 015, Radar downwind to the ILS
Based F-22
Flight Track: 08A03 - Radar vectors to ILS runway 08 from Warning Areas

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:189,000 (1 inch = 15,700 feet)

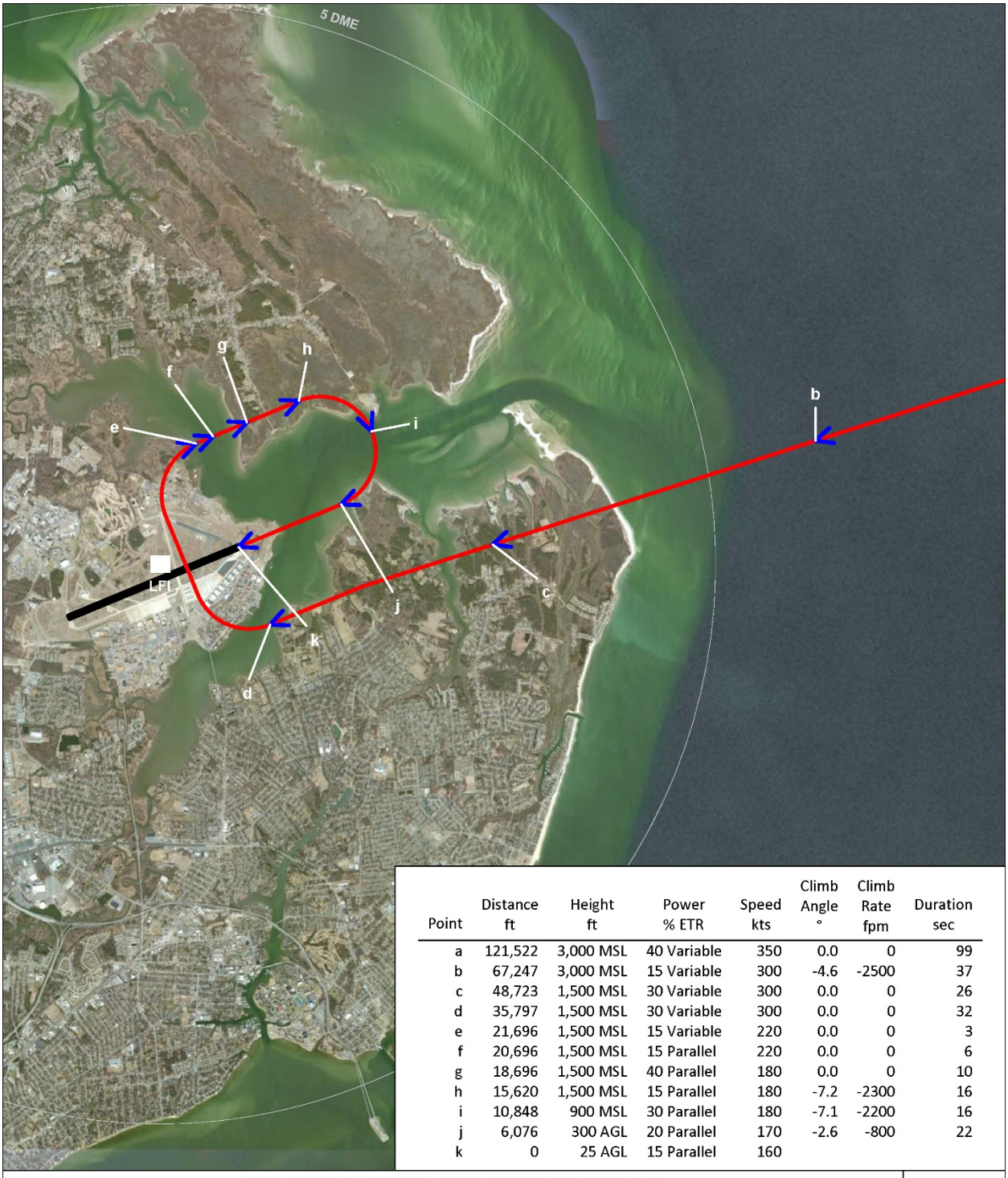


Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	112,462	3,000 MSL	40 Variable	350	0.0	0	89
b	63,383	3,000 MSL	15 Variable	300	-4.7	-2500	36
c	45,160	1,500 MSL	30 Variable	300	0.0	0	24
d	32,786	1,500 MSL	30 Variable	300	0.0	0	25
e	21,723	1,500 MSL	15 Variable	220	0.0	0	3
f	20,723	1,500 MSL	15 Parallel	220	0.0	0	6
g	18,723	1,500 MSL	40 Parallel	180	0.0	0	10
h	15,620	1,500 MSL	15 Parallel	180	-7.2	-2200	16
i	10,848	900 MSL	30 Parallel	170	-7.1	-2100	17
j	6,076	300 AGL	20 Parallel	160	-2.6	-700	22
k	0	25 AGL	15 Parallel	160			

Flight Profile 022, St-in to Pitch Arrival
Based F-22
Flight Track: 26A40 - Straight-in arrival to runway 26 (1st ship)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:84,900 (1 inch = 7,080 feet)

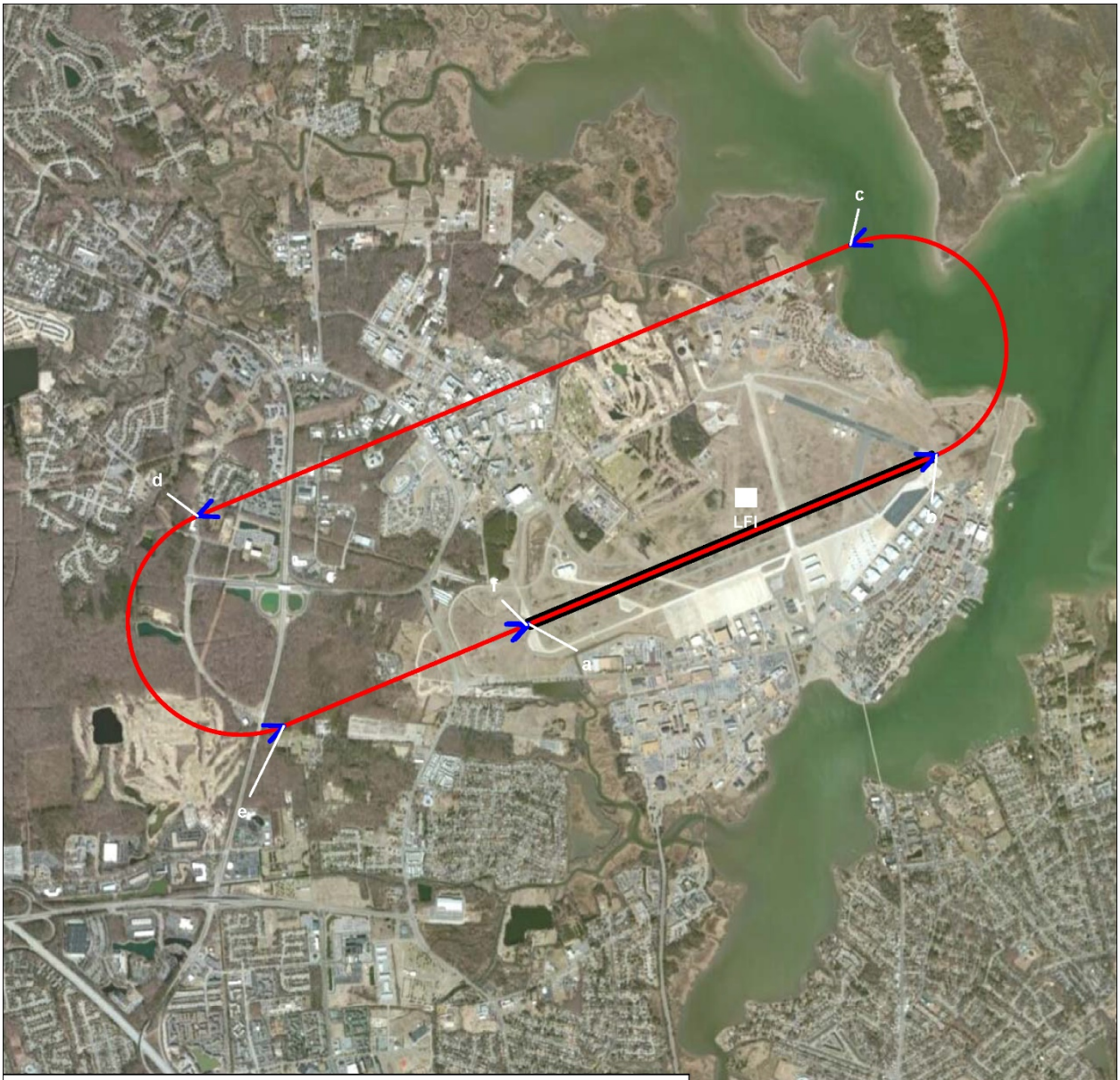


Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	121,522	3,000 MSL	40 Variable	350	0.0	0	99
b	67,247	3,000 MSL	15 Variable	300	-4.6	-2500	37
c	48,723	1,500 MSL	30 Variable	300	0.0	0	26
d	35,797	1,500 MSL	30 Variable	300	0.0	0	32
e	21,696	1,500 MSL	15 Variable	220	0.0	0	3
f	20,696	1,500 MSL	15 Parallel	220	0.0	0	6
g	18,696	1,500 MSL	40 Parallel	180	0.0	0	10
h	15,620	1,500 MSL	15 Parallel	180	-7.2	-2300	16
i	10,848	900 MSL	30 Parallel	180	-7.1	-2200	16
j	6,076	300 AGL	20 Parallel	170	-2.6	-800	22
k	0	25 AGL	15 Parallel	160			

Flight Profile 023, St-in to Pitch Arrival Offset Wingman
Based F-22
Flight Track: 26A40-2 - Straight-in arrival to runway 26 (2nd ship tactical)

0 4,000 8,000 12,000 16,000 20,000 24,000

Scale in Feet 1:77,300 (1 inch = 6,440 feet)

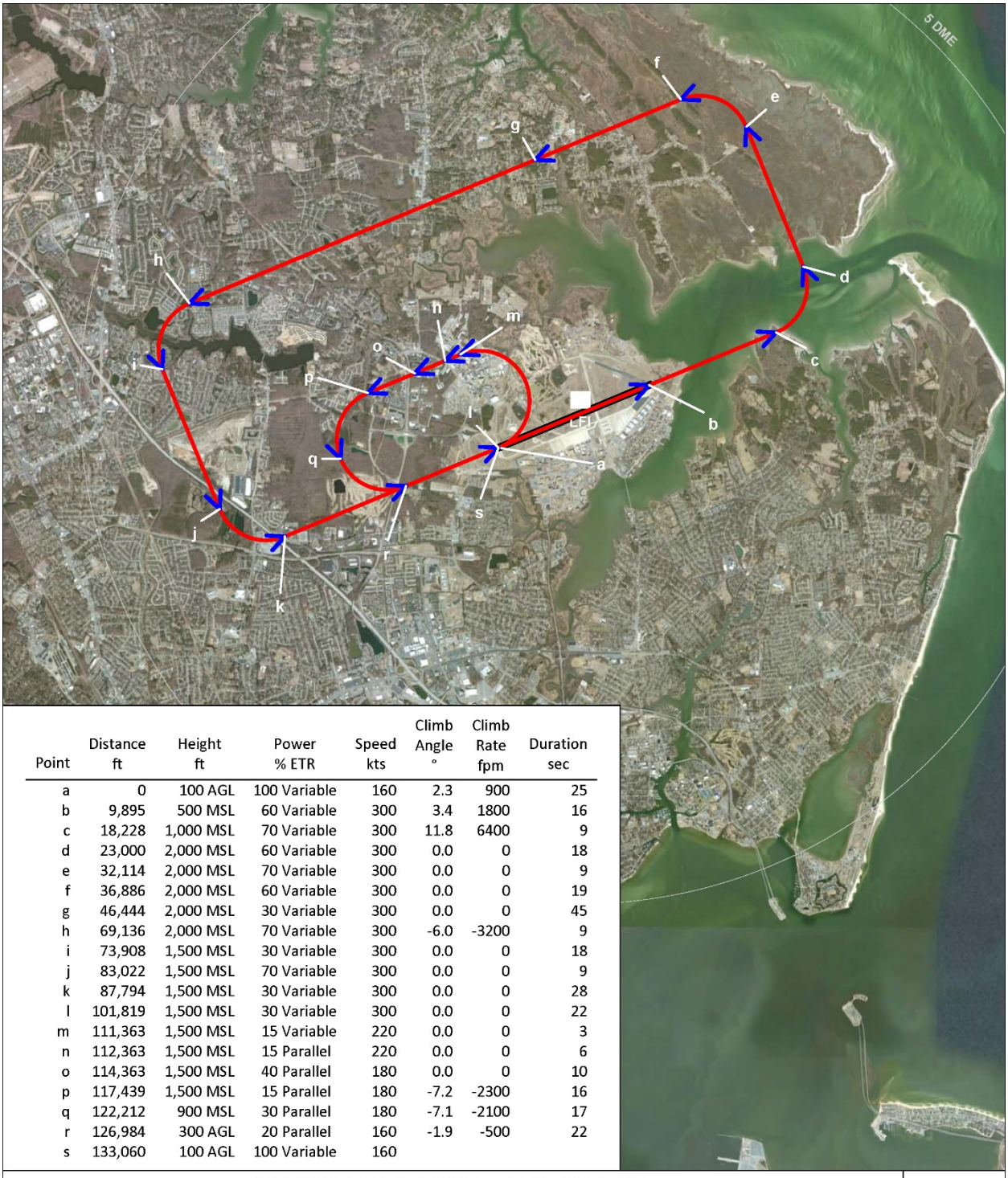


Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	25 AGL	100 Variable	160	1.5	700	23
b	10,086	300 MSL	100 Variable	350	8.4	4300	17
c	18,199	1,500 MSL	30 Parallel	220	0.0	0	44
d	34,362	1,500 MSL	15 Parallel	220	-8.4	-2800	25
e	42,474	300 AGL	15 Parallel	160	-2.6	-700	22
f	48,487	25 AGL	100 Variable	160			

Flight Profile 027, Standard inside closed
Based F-22
Flight Track: 08C01 - F-22 inside downwind to runway 08

0 2,000 4,000 6,000 8,000 10,000

Scale in Feet 1:35,900 (1 inch = 3,000 feet)



Point	Distance ft	Height ft	Power % ETR	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	100 AGL	100 Variable	160	2.3	900	25
b	9,895	500 MSL	60 Variable	300	3.4	1800	16
c	18,228	1,000 MSL	70 Variable	300	11.8	6400	9
d	23,000	2,000 MSL	60 Variable	300	0.0	0	18
e	32,114	2,000 MSL	70 Variable	300	0.0	0	9
f	36,886	2,000 MSL	60 Variable	300	0.0	0	19
g	46,444	2,000 MSL	30 Variable	300	0.0	0	45
h	69,136	2,000 MSL	70 Variable	300	-6.0	-3200	9
i	73,908	1,500 MSL	30 Variable	300	0.0	0	18
j	83,022	1,500 MSL	70 Variable	300	0.0	0	9
k	87,794	1,500 MSL	30 Variable	300	0.0	0	28
l	101,819	1,500 MSL	30 Variable	300	0.0	0	22
m	111,363	1,500 MSL	15 Variable	220	0.0	0	3
n	112,363	1,500 MSL	15 Parallel	220	0.0	0	6
o	114,363	1,500 MSL	40 Parallel	180	0.0	0	10
p	117,439	1,500 MSL	15 Parallel	180	-7.2	-2300	16
q	122,212	900 MSL	30 Parallel	180	-7.1	-2100	17
r	126,984	300 AGL	20 Parallel	160	-1.9	-500	22
s	133,060	100 AGL	100 Variable	160			

Flight Profile 033, Standard ouside closed w/ break
Based F-22
Flight Track: 08C06 - outside downwind to runway 08

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000

Scale in Feet 1:85,800 (1 inch = 7,150 feet)

B.1.3.1.2 Flight Profiles for the T-38Cs

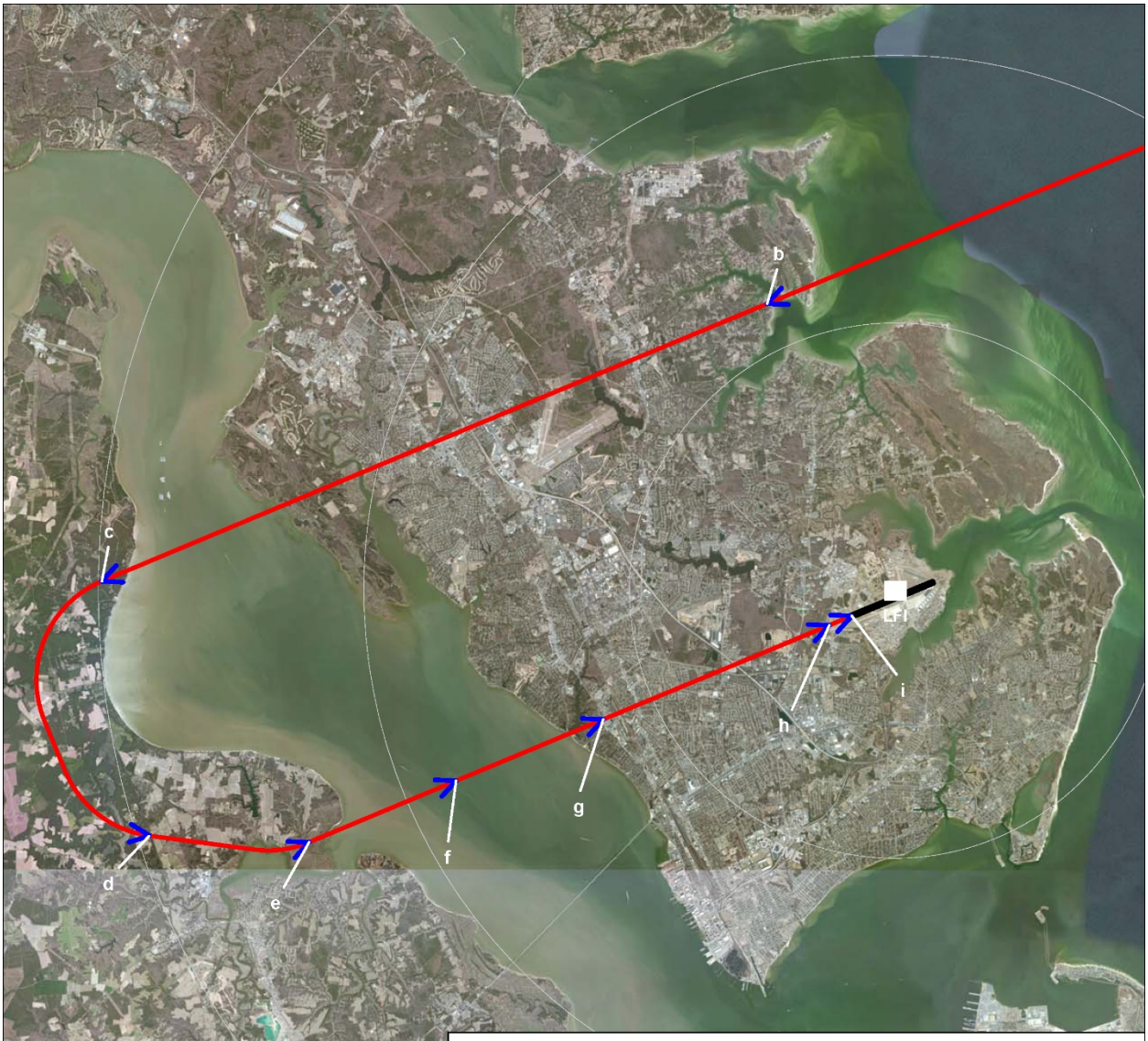


Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	100 Max A/B	0	0.0	0	26
b	3,500	0 AGL	100 Afterburner	160	2.5	900	13
c	8,000	200 AGL	100 Afterburner	250	5.7	2800	4
d	10,000	400 AGL	100 Variable	300	6.8	3600	26
e	23,296	2,000 MSL	100 Variable	300	6.8	3600	33
f	40,000	4,000 MSL	100 Variable	300	2.5	1300	316
g	200,000	11,000 MSL	100 Variable	300			

Flight Profile 101, AB - W386
Based T-38C
Flight Track: 08D01 - straight out IFR off runway 08

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:147,000 (1 inch = 12,200 feet)

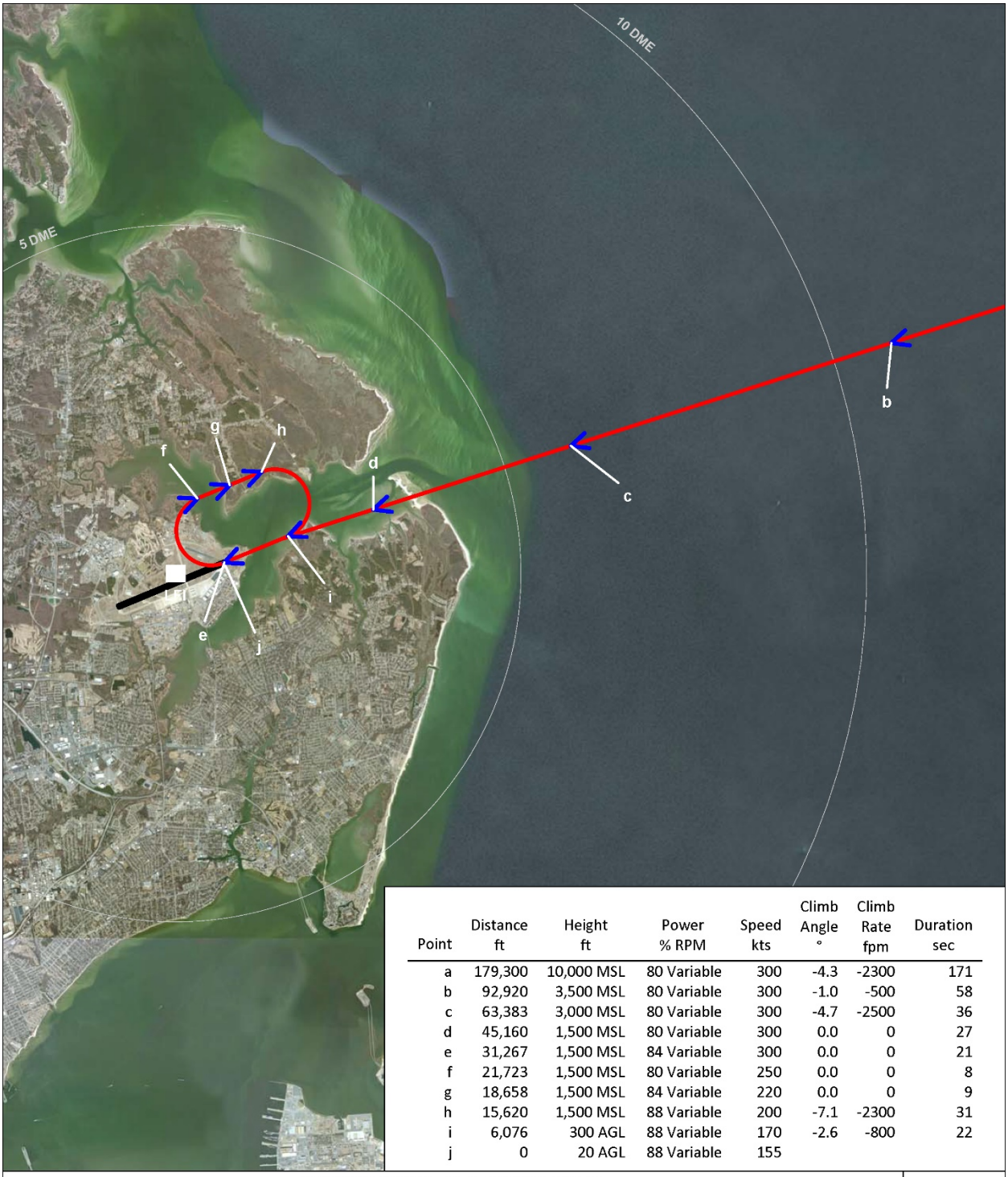


Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	335,800	6,000 MSL	80 Variable	250	-1.3	-600	308
b	205,932	3,000 MSL	80 Variable	250	0.0	0	195
c	123,616	3,000 MSL	80 Variable	250	-1.5	-700	92
d	85,726	2,000 MSL	80 Variable	240	0.0	0	48
e	67,211	2,000 MSL	80 Variable	220	-1.3	-500	51
f	48,994	1,600 MSL	85 Variable	200	0.0	0	57
g	30,762	1,600 MSL	85 Variable	180	-2.9	-900	99
h	2,792	180 MSL	85 Variable	155	-2.5	-700	11
i	0	50 AGL	85 Variable	155			

Flight Profile 107, Radar downwind to the ILS
Based T-38C
Flight Track: 08A03 - Radar vectors to ILS runway 08 from Warning Areas

0 10,000 20,000 30,000 40,000 50,000 60,000

Scale in Feet 1:184,000 (1 inch = 15,300 feet)



Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	179,300	10,000 MSL	80 Variable	300	-4.3	-2300	171
b	92,920	3,500 MSL	80 Variable	300	-1.0	-500	58
c	63,383	3,000 MSL	80 Variable	300	-4.7	-2500	36
d	45,160	1,500 MSL	80 Variable	300	0.0	0	27
e	31,267	1,500 MSL	84 Variable	300	0.0	0	21
f	21,723	1,500 MSL	80 Variable	250	0.0	0	8
g	18,658	1,500 MSL	84 Variable	220	0.0	0	9
h	15,620	1,500 MSL	88 Variable	200	-7.1	-2300	31
i	6,076	300 AGL	88 Variable	170	-2.6	-800	22
j	0	20 AGL	88 Variable	155			

Flight Profile 120, St-in to Pitch Arrival
Based T-38C
Flight Track: 26A40 - Straight-in arrival to runway 26 (1st ship)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:124,000 (1 inch = 10,400 feet)

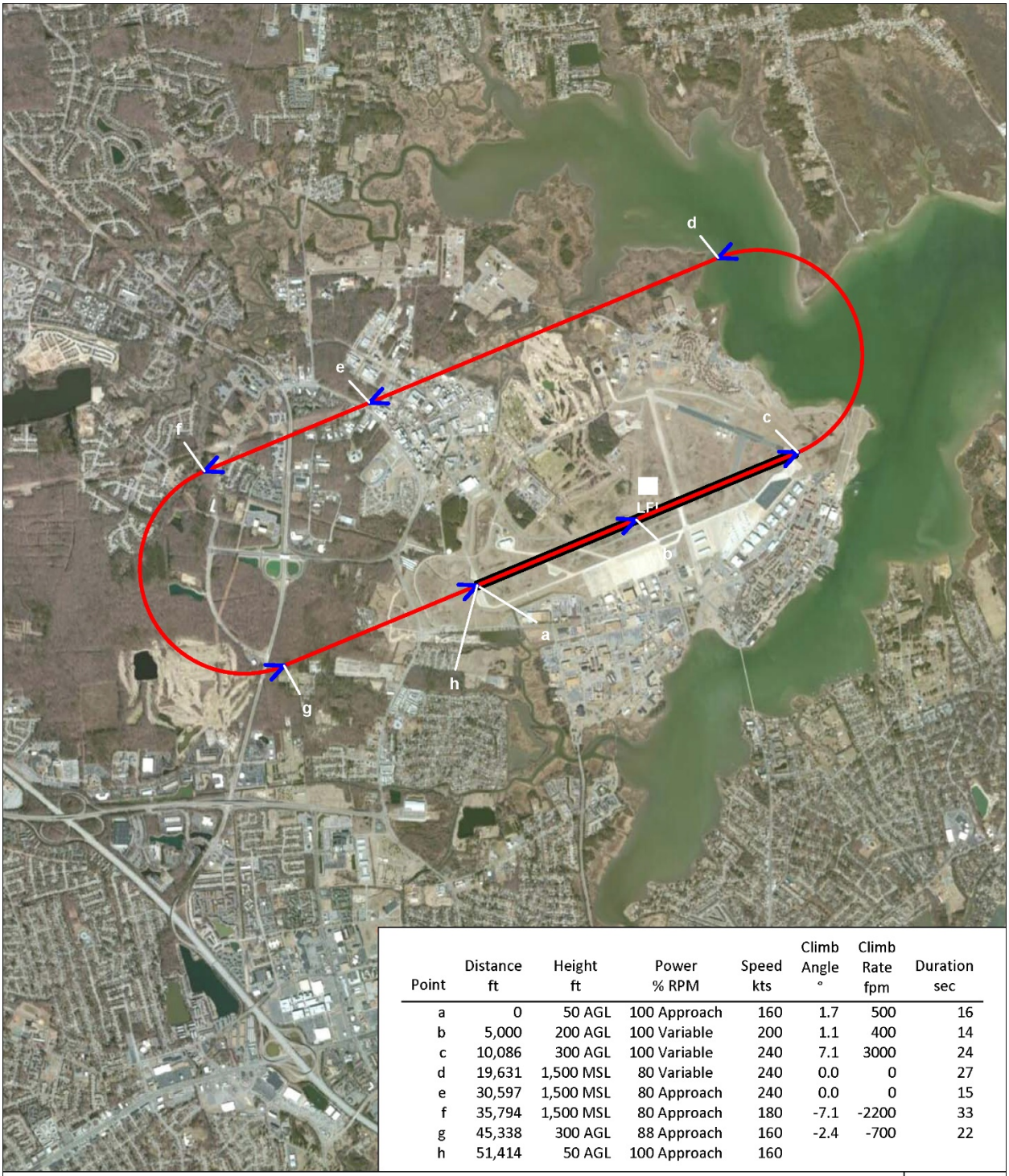


Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	183,803	10,000 MSL	80 Variable	300	-4.3	-2300	171
b	97,423	3,500 MSL	80 Variable	300	-0.9	-500	60
c	67,247	3,000 MSL	80 Variable	300	-4.6	-2500	37
d	48,723	1,500 MSL	80 Variable	300	0.0	0	26
e	35,797	1,500 MSL	84 Variable	300	0.0	0	30
f	21,696	1,500 MSL	80 Variable	250	0.0	0	8
g	18,658	1,500 MSL	84 Variable	220	0.0	0	9
h	15,620	1,500 MSL	88 Variable	200	-7.1	-2300	31
i	6,076	300 AGL	88 Variable	170	-2.6	-800	22
j	0	20 AGL	88 Variable	155			

Flight Profile 121, St-in to Pitch Arrival Offset Wingman
Based T-38C
Flight Track: 26A40-2 - Straight-in arrival to runway 26 (2nd ship tactical)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

Scale in Feet 1:124,000 (1 inch = 10,400 feet)



Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	50 AGL	100 Approach	160	1.7	500	16
b	5,000	200 AGL	100 Variable	200	1.1	400	14
c	10,086	300 AGL	100 Variable	240	7.1	3000	24
d	19,631	1,500 MSL	80 Variable	240	0.0	0	27
e	30,597	1,500 MSL	80 Approach	240	0.0	0	15
f	35,794	1,500 MSL	80 Approach	180	-7.1	-2200	33
g	45,338	300 AGL	88 Approach	160	-2.4	-700	22
h	51,414	50 AGL	100 Approach	160			

Flight Profile 141, Standard inside closed
Based T-38C
Flight Track: 08C03 - T-38 inside downwind to runway 08

0 2,000 4,000 6,000 8,000 10,000 12,000

Scale in Feet 1:41,200 (1 inch = 3,430 feet)



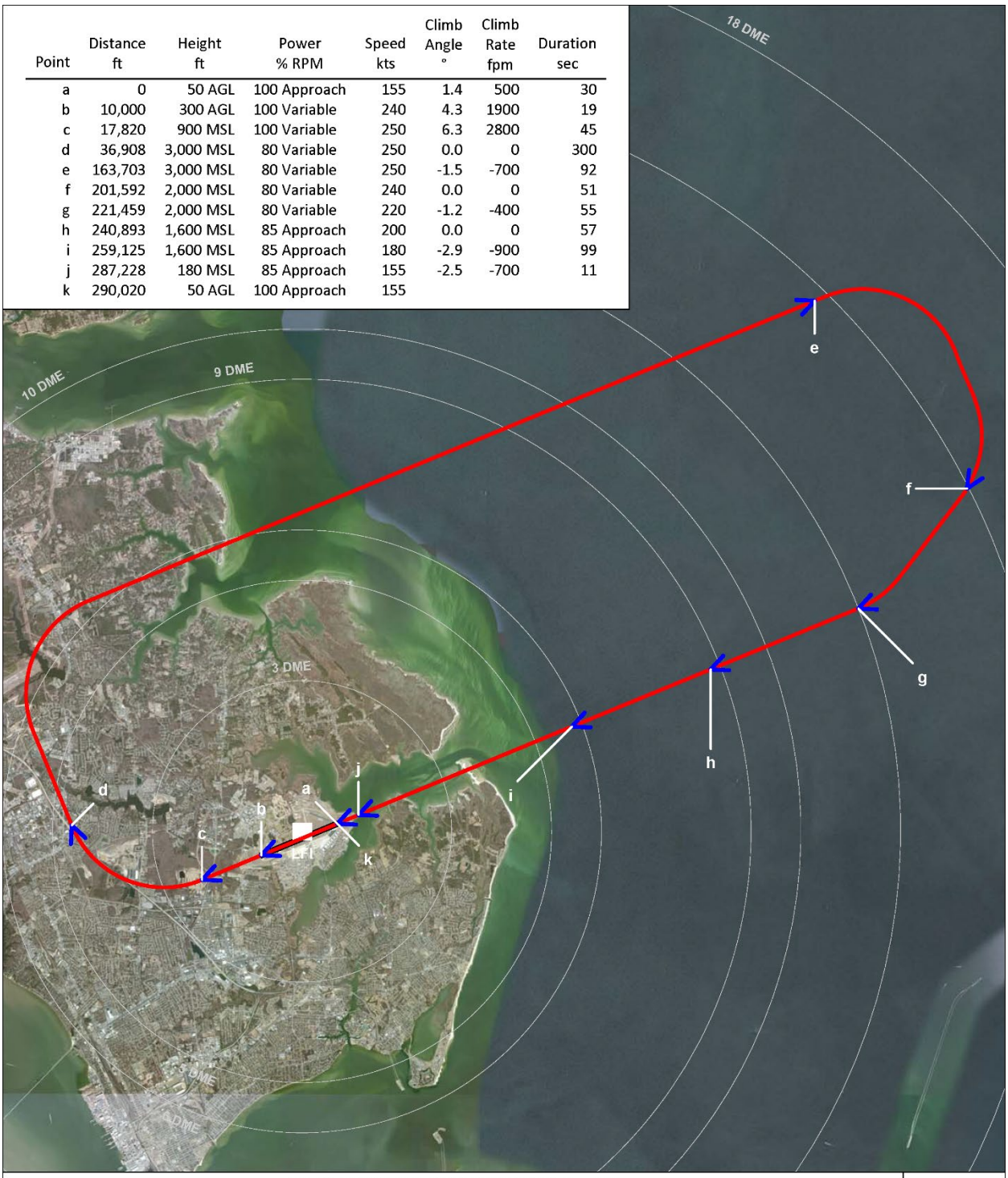
Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	50 AGL	100 Approach	155	1.4	500	30
b	10,000	300 AGL	100 Variable	240	4.1	2000	18
c	18,228	900 MSL	100 Variable	300	6.6	3500	19
d	27,773	2,000 MSL	85 Variable	300	0.0	0	82
e	69,136	2,000 MSL	85 Variable	300	-1.4	-800	40
f	89,287	1,500 MSL	80 Variable	300	0.0	0	25
g	101,819	1,500 MSL	84 Variable	300	0.0	0	21
h	111,363	1,500 MSL	80 Variable	250	0.0	0	8
i	114,401	1,500 MSL	84 Variable	220	0.0	0	9
j	117,439	1,500 MSL	88 Approach	200	-7.1	-2300	31
k	126,984	300 AGL	88 Approach	170	-2.4	-700	22
l	133,060	50 AGL	100 Approach	155			

Flight Profile 147, Standard outside closed w/break
Based T-38C
Flight Track: 08C06 - outside downwind to runway 08

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000

Scale in Feet 1:103,000 (1 inch = 8,620 feet)

Point	Distance ft	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	50 AGL	100 Approach	155	1.4	500	30
b	10,000	300 AGL	100 Variable	240	4.3	1900	19
c	17,820	900 MSL	100 Variable	250	6.3	2800	45
d	36,908	3,000 MSL	80 Variable	250	0.0	0	300
e	163,703	3,000 MSL	80 Variable	250	-1.5	-700	92
f	201,592	2,000 MSL	80 Variable	240	0.0	0	51
g	221,459	2,000 MSL	80 Variable	220	-1.2	-400	55
h	240,893	1,600 MSL	85 Approach	200	0.0	0	57
i	259,125	1,600 MSL	85 Approach	180	-2.9	-900	99
j	287,228	180 MSL	85 Approach	155	-2.5	-700	11
k	290,020	50 AGL	100 Approach	155			



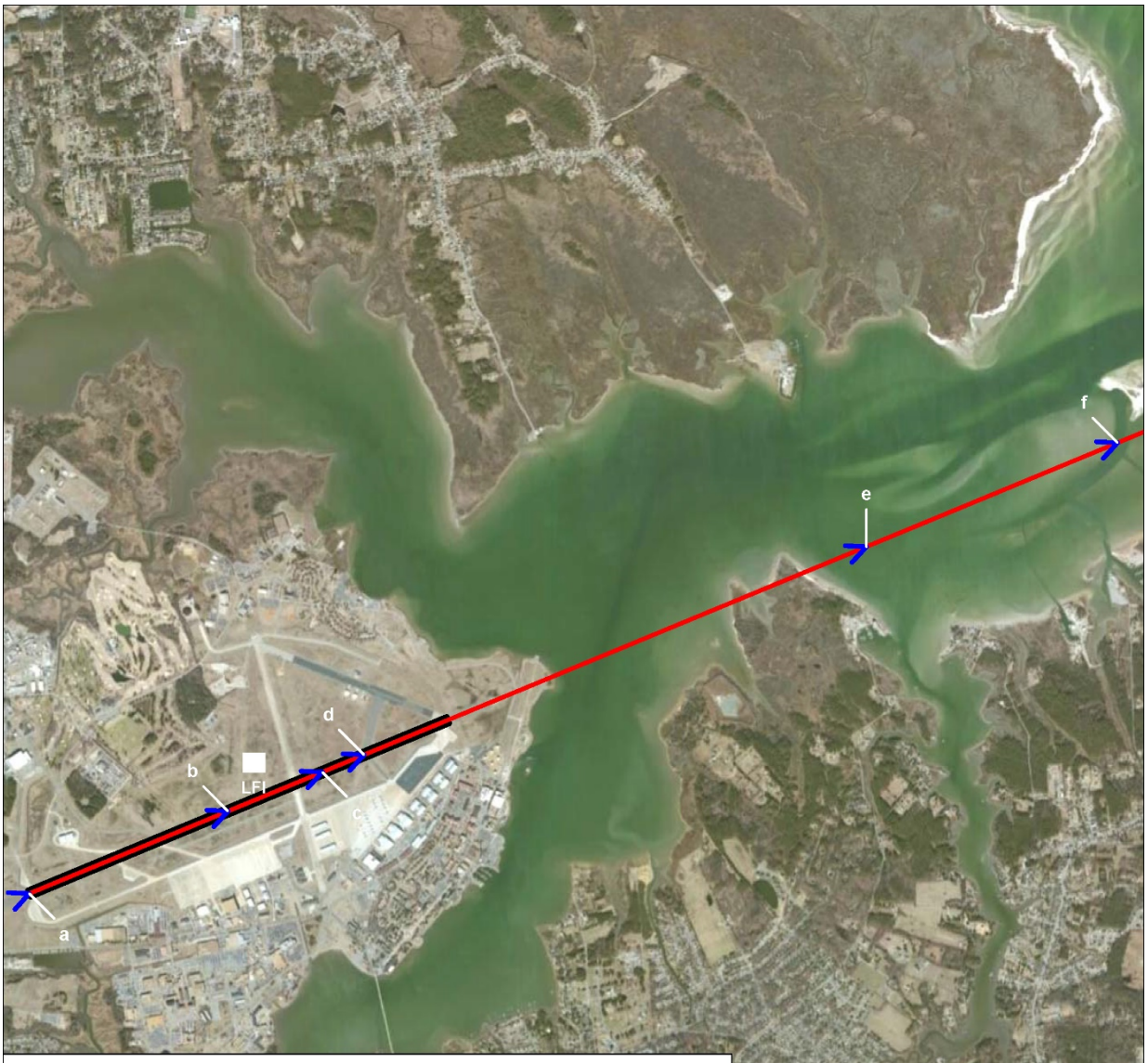
Flight Profile 150, IFR Closed Pattern - ILS
Based T-38C
Flight Track: 26C10 - ILS Closed Pattern

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:172,000 (1 inch = 14,300 feet)

B.1.3.2 Contract ADAIR Aircraft Representative Flight Profiles

B.1.3.2.1 Contract ADAIR High Noise Eurofighter Typhoon (F-18E/F Surrogate)



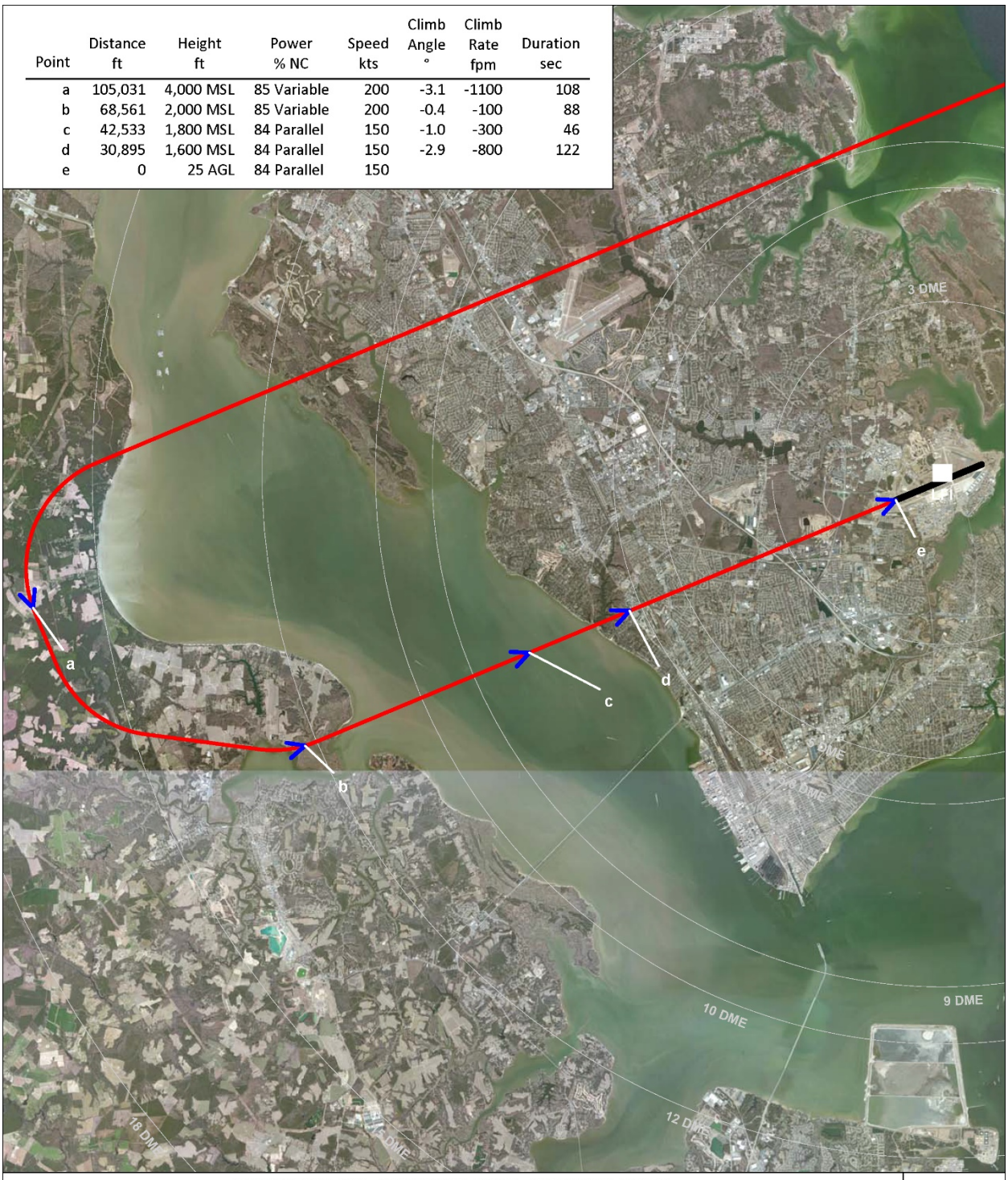
Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	88 Variable	0	0.0	0	38
b	4,750	0 AGL	97 Afterburner	150	10.5	3700	7
c	7,000	415 AGL	97 Afterburner	250	10.5	4700	2
d	8,000	600 AGL	97 Variable	250	10.4	5200	26
e	20,000	2,800 AGL	97 Variable	305	11.3	6600	11
f	26,000	4,000 AGL	97 Variable	350	11.3	7100	51
g	56,000	10,000 AGL	97 Variable	350	11.3	7100	59
h	91,000	17,000 AGL	82 Variable	350			

Flight Profile 401, ADAIR High Noise Departure
ADAIR Type C High
Flight Track: 08D01 - straight out IFR off runway 08

0 2,000 4,000 6,000 8,000 10,000

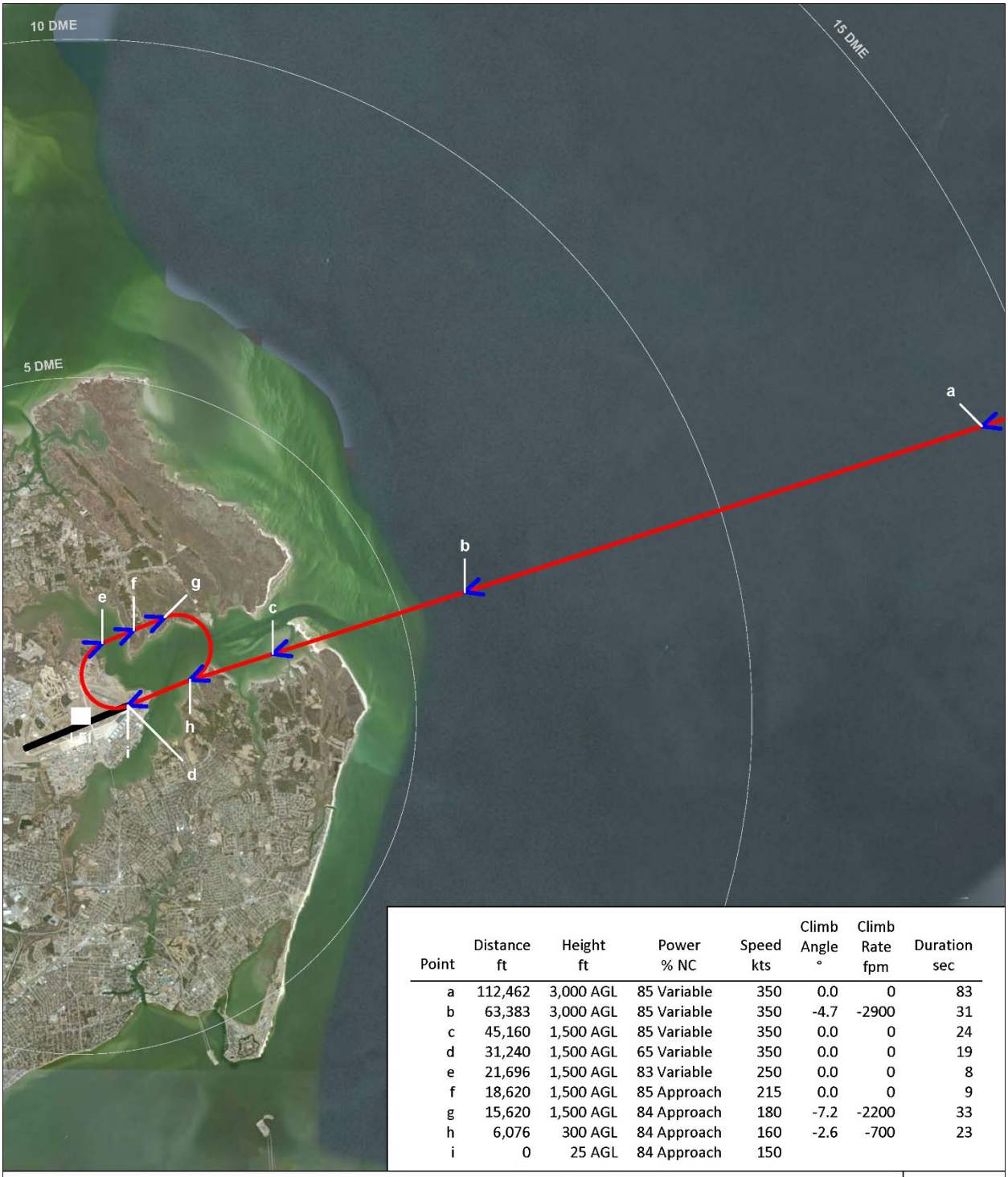
Scale in Feet 1:35,500 (1 inch = 2,960 feet)

Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	105,031	4,000 MSL	85 Variable	200	-3.1	-1100	108
b	68,561	2,000 MSL	85 Variable	200	-0.4	-100	88
c	42,533	1,800 MSL	84 Parallel	150	-1.0	-300	46
d	30,895	1,600 MSL	84 Parallel	150	-2.9	-800	122
e	0	25 AGL	84 Parallel	150			



Flight Profile 408, ADAIR High Noise - Straight In Arrival
ADAIR Type C High
Flight Track: 08A03 - Radar vectors to ILS runway 08 from Warning Areas

Scale in Feet 1:152,000 (1 inch = 12,600 feet)

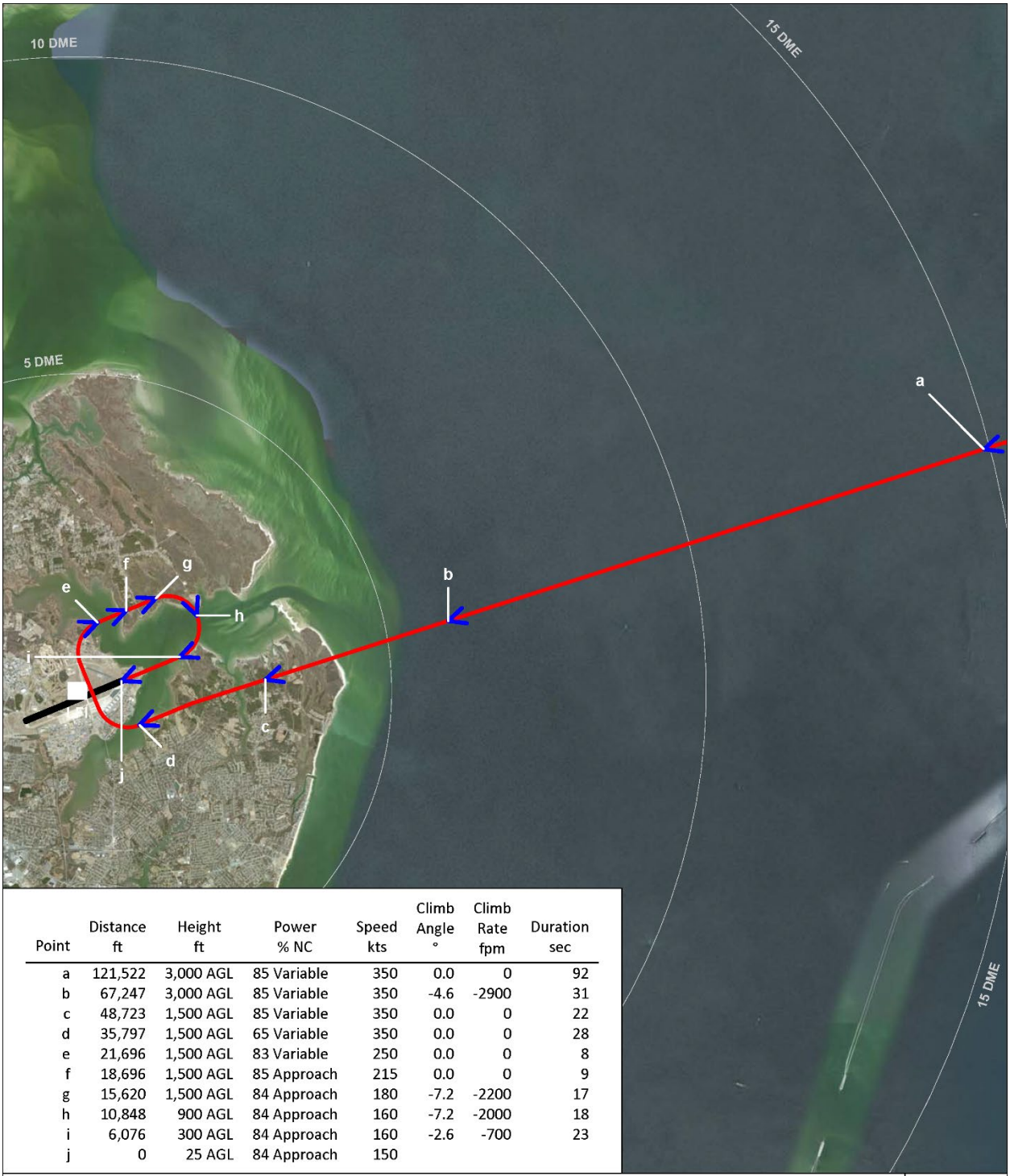


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	112,462	3,000 AGL	85 Variable	350	0.0	0	83
b	63,383	3,000 AGL	85 Variable	350	-4.7	-2900	31
c	45,160	1,500 AGL	85 Variable	350	0.0	0	24
d	31,240	1,500 AGL	65 Variable	350	0.0	0	19
e	21,696	1,500 AGL	83 Variable	250	0.0	0	8
f	18,620	1,500 AGL	85 Approach	215	0.0	0	9
g	15,620	1,500 AGL	84 Approach	180	-7.2	-2200	33
h	6,076	300 AGL	84 Approach	160	-2.6	-700	23
i	0	25 AGL	84 Approach	150			

Flight Profile 415, ADAIR High Noise - OH Break - Arrival
ADAIR Type C High
Flight Track: 26A40 - Straight-in arrival to runway 26 (1st ship)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,700 feet)

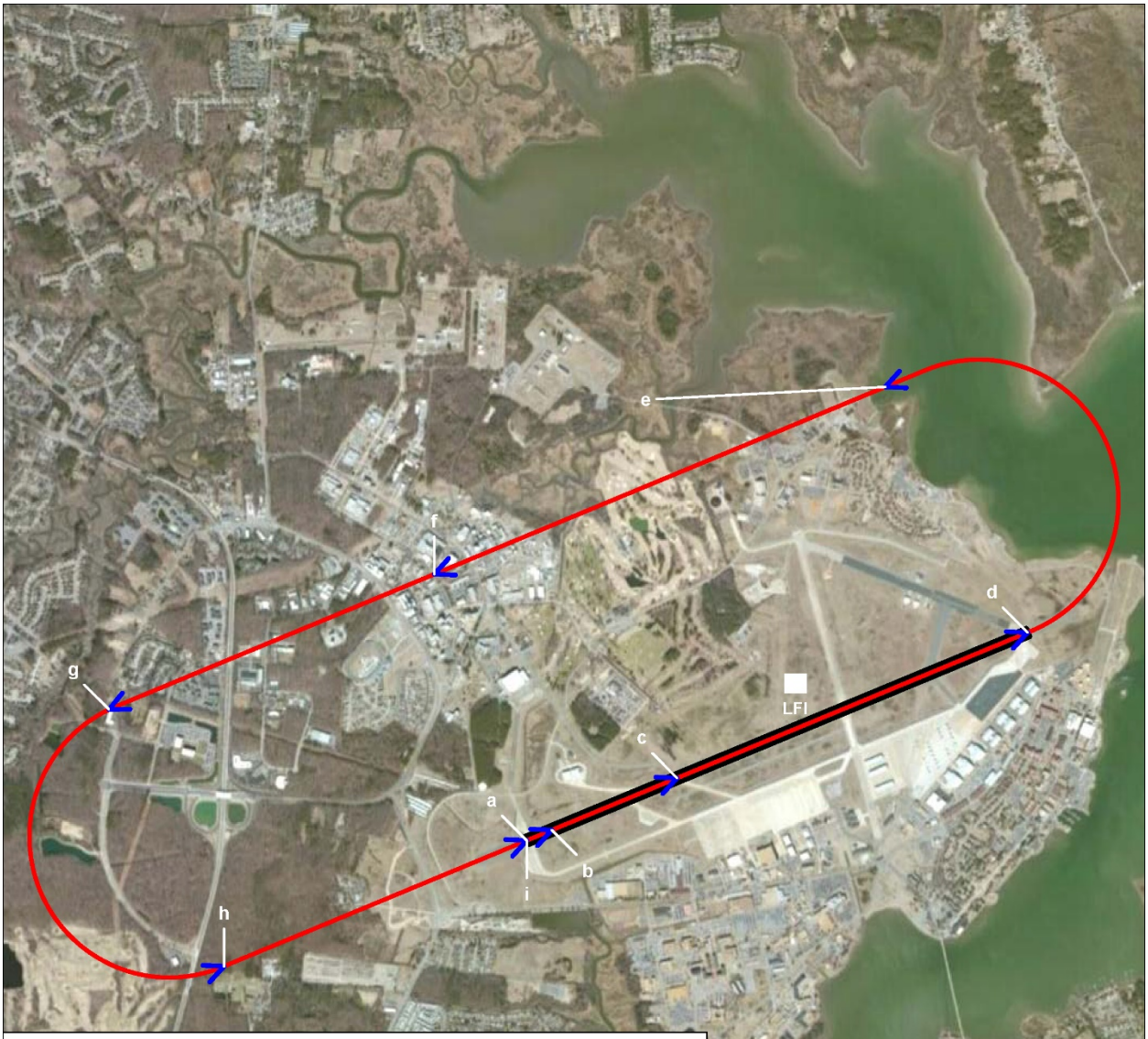


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	121,522	3,000 AGL	85 Variable	350	0.0	0	92
b	67,247	3,000 AGL	85 Variable	350	-4.6	-2900	31
c	48,723	1,500 AGL	85 Variable	350	0.0	0	22
d	35,797	1,500 AGL	65 Variable	350	0.0	0	28
e	21,696	1,500 AGL	83 Variable	250	0.0	0	8
f	18,696	1,500 AGL	85 Approach	215	0.0	0	9
g	15,620	1,500 AGL	84 Approach	180	-7.2	-2200	17
h	10,848	900 AGL	84 Approach	160	-7.2	-2000	18
i	6,076	300 AGL	84 Approach	160	-2.6	-700	23
j	0	25 AGL	84 Approach	150			

Flight Profile 416, ADAIR High Noise - OH Break - Arrival - Offset Wingman
ADAIR Type C High
Flight Track: 26A40-2 - Straight-in arrival to runway 26 (2nd ship tactical)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:137,000 (1 inch = 11,400 feet)

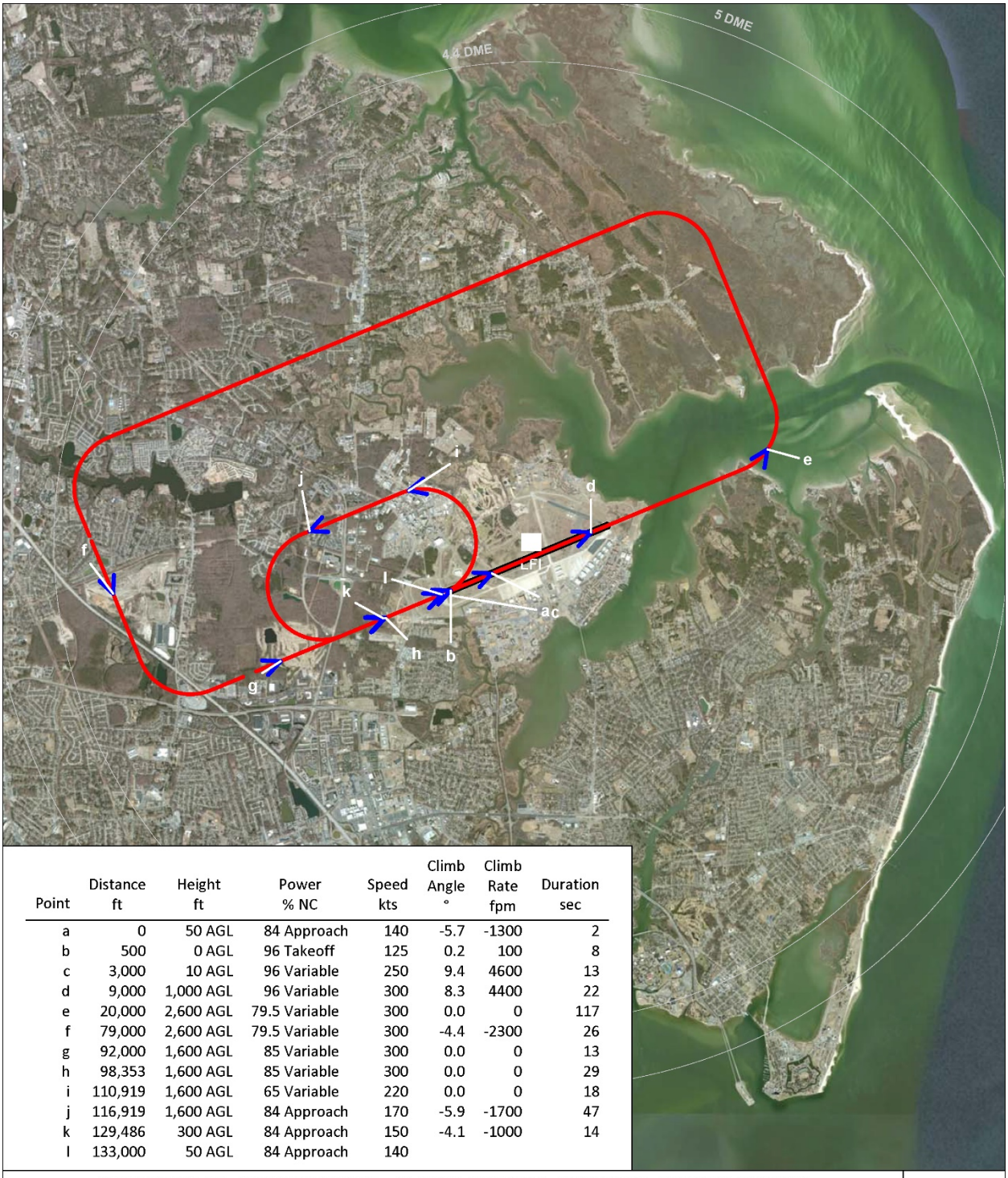


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	25 AGL	84 Approach	150	-2.9	-700	2
b	500	0 AGL	96 Takeoff	125	0.2	100	8
c	3,000	10 AGL	96 Takeoff	250	8.0	3900	15
d	10,000	1,000 AGL	91 Variable	300	3.2	1500	21
e	19,000	1,500 AGL	83 Variable	220	0.0	0	24
f	28,000	1,500 AGL	84 Approach	220	0.0	0	19
g	34,500	1,500 AGL	84 Approach	180	-8.5	-2600	28
h	42,500	300 AGL	84 Approach	160	-2.6	-700	23
i	48,547	25 AGL	84 Approach	150			

Flight Profile 430, ADAIR High Noise - CLOSED PATTERN
ADAIR Type C High
Flight Track: 08C01 - F-22 inside downwind to runway 08

0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000

Scale in Feet 1:29,700 (1 inch = 2,480 feet)



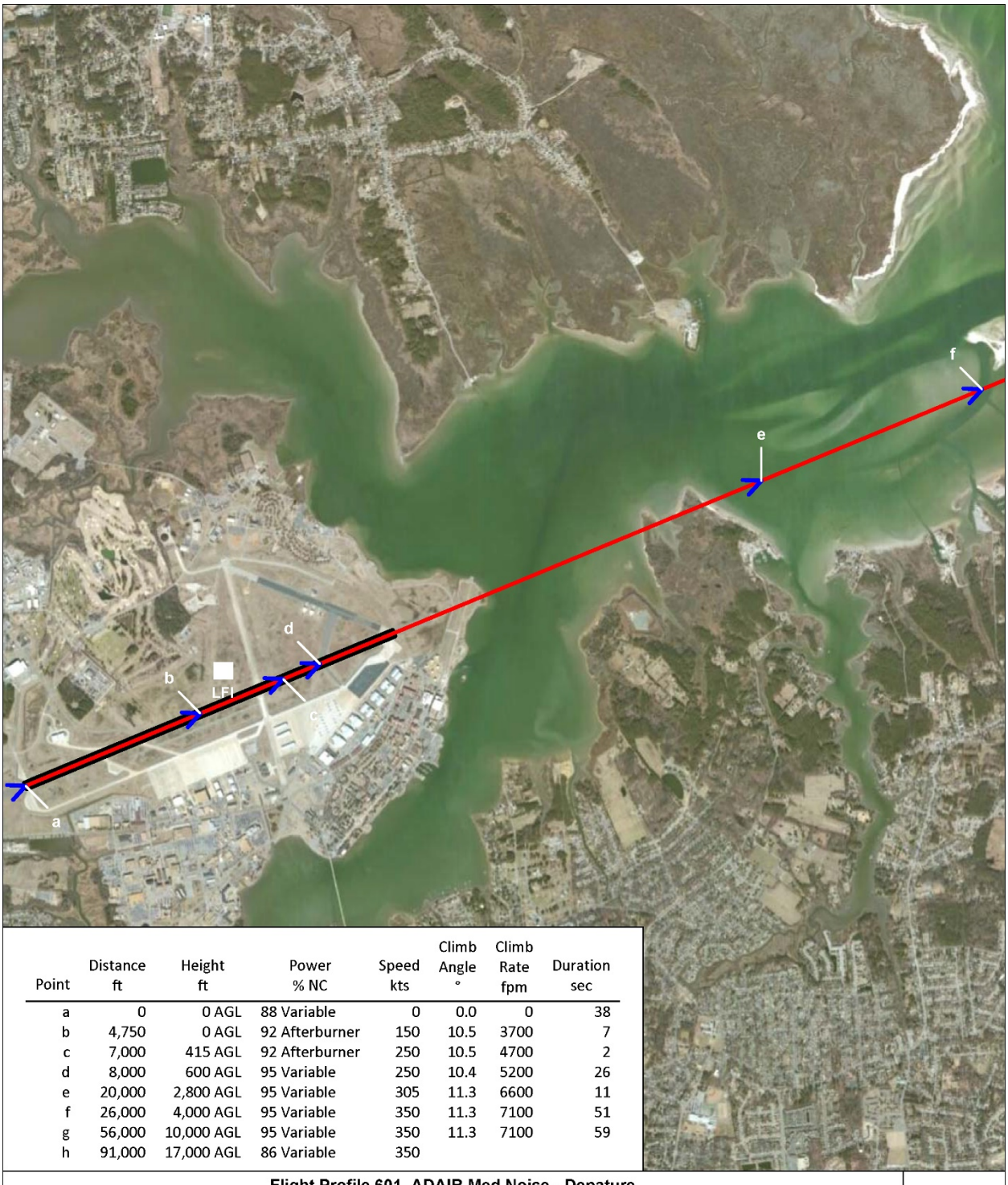
Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	50 AGL	84 Approach	140	-5.7	-1300	2
b	500	0 AGL	96 Takeoff	125	0.2	100	8
c	3,000	10 AGL	96 Variable	250	9.4	4600	13
d	9,000	1,000 AGL	96 Variable	300	8.3	4400	22
e	20,000	2,600 AGL	79.5 Variable	300	0.0	0	117
f	79,000	2,600 AGL	79.5 Variable	300	-4.4	-2300	26
g	92,000	1,600 AGL	85 Variable	300	0.0	0	13
h	98,353	1,600 AGL	85 Variable	300	0.0	0	29
i	110,919	1,600 AGL	65 Variable	220	0.0	0	18
j	116,919	1,600 AGL	84 Approach	170	-5.9	-1700	47
k	129,486	300 AGL	84 Approach	150	-4.1	-1000	14
l	133,000	50 AGL	84 Approach	140			

Flight Profile 434, ADAIR High Noise - CLOSED PATTERN - With Break - REPRESENTATIVE
ADAIR Type C High
Flight Track: 08C06 - outside downwind to runway 08

0 4,000 8,000 12,000 16,000 20,000 24,000

Scale in Feet 1:79,200 (1 inch = 6,600 feet)

B.1.3.2.2 Contract ADAIR Medium Noise Dassault Mirage (F-16C F100 PW220 Surrogate)



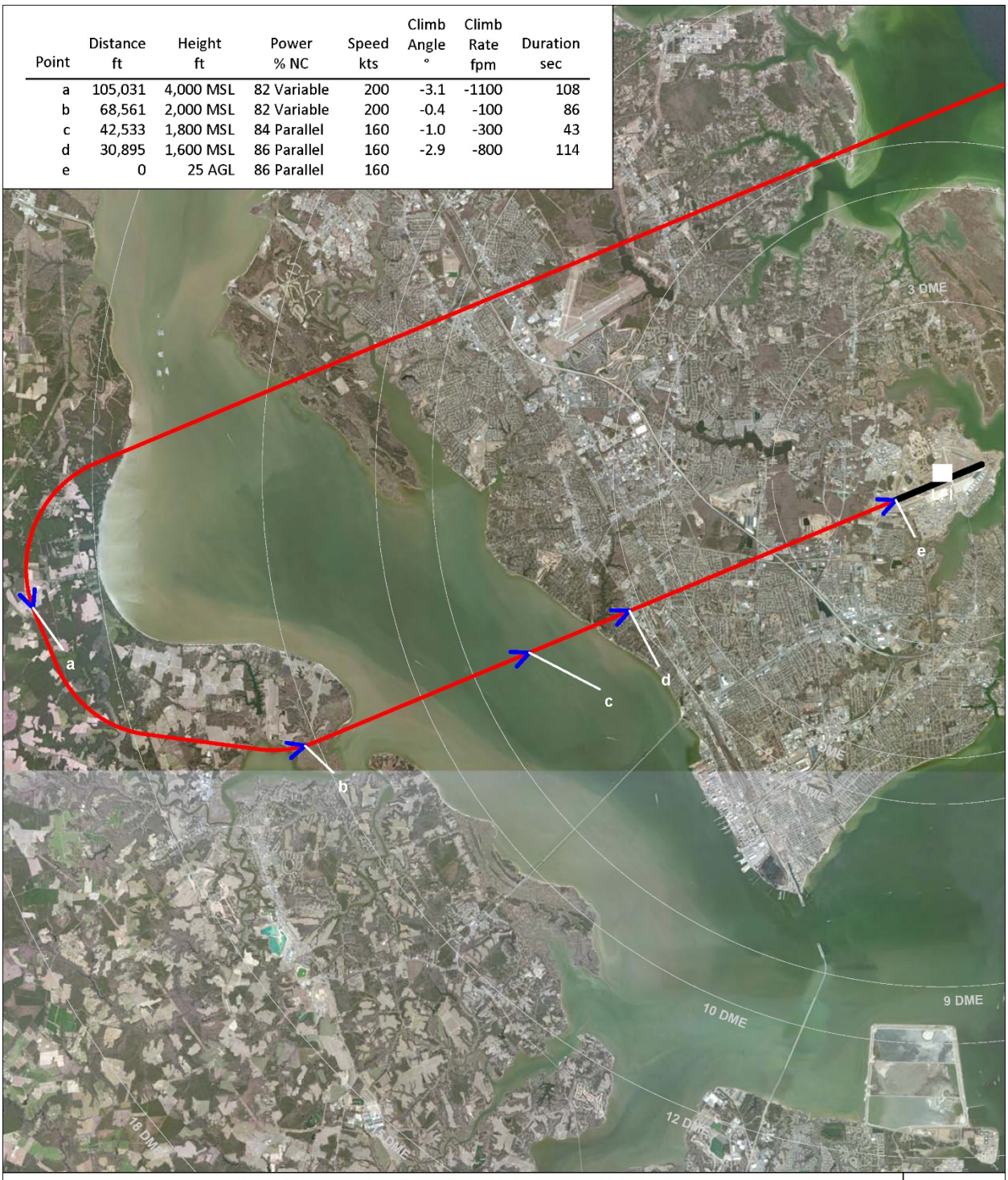
Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	88 Variable	0	0.0	0	38
b	4,750	0 AGL	92 Afterburner	150	10.5	3700	7
c	7,000	415 AGL	92 Afterburner	250	10.5	4700	2
d	8,000	600 AGL	95 Variable	250	10.4	5200	26
e	20,000	2,800 AGL	95 Variable	305	11.3	6600	11
f	26,000	4,000 AGL	95 Variable	350	11.3	7100	51
g	56,000	10,000 AGL	95 Variable	350	11.3	7100	59
h	91,000	17,000 AGL	86 Variable	350			

Flight Profile 601, ADAIR Med Noise - Depature
ADAIR Type C Medium
Flight Track: 08D01 - straight out IFR off runway 08

0 2,000 4,000 6,000 8,000 10,000

Scale in Feet 1:35,500 (1 inch = 2,960 feet)

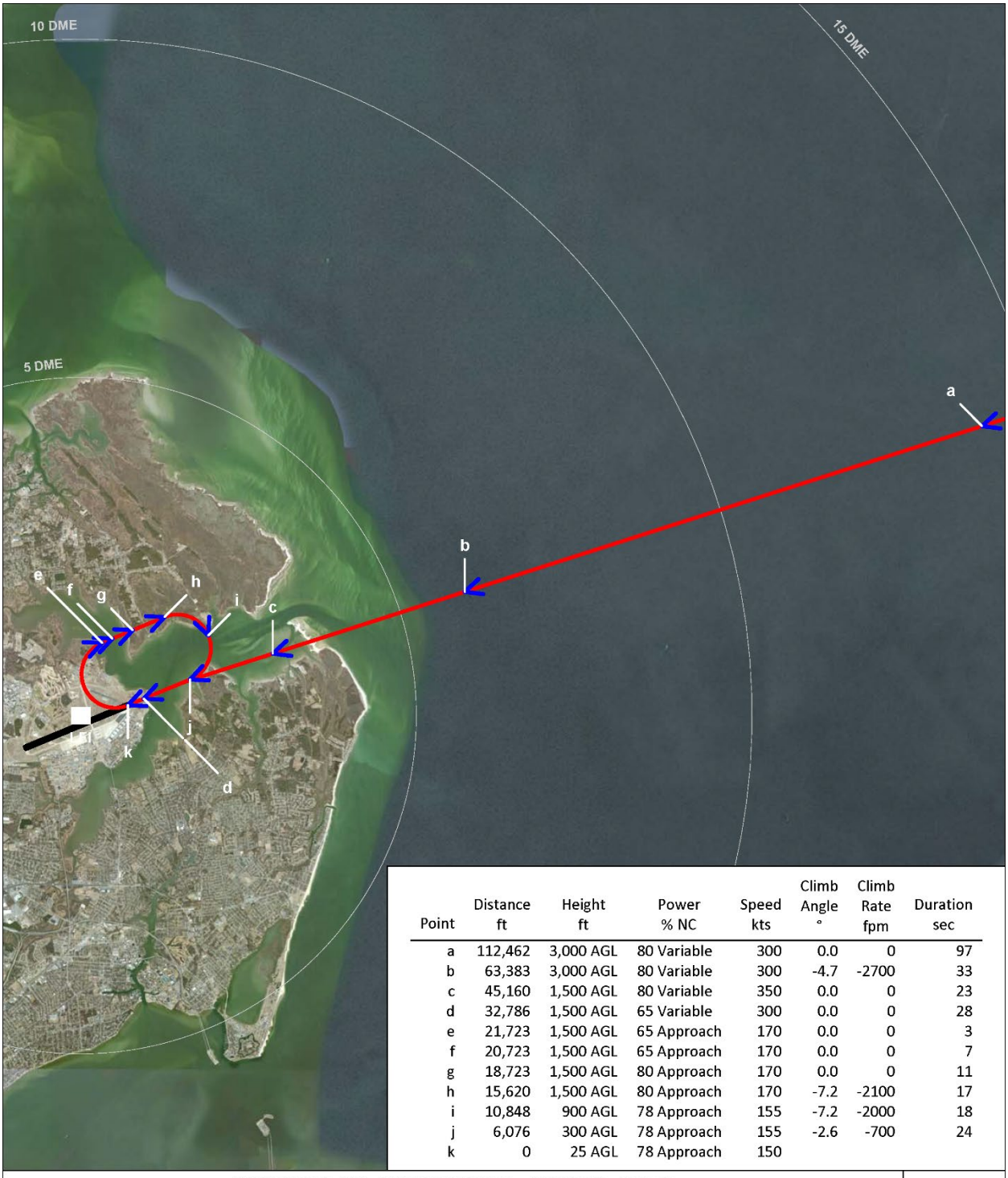
Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	105,031	4,000 MSL	82 Variable	200	-3.1	-1100	108
b	68,561	2,000 MSL	82 Variable	200	-0.4	-100	86
c	42,533	1,800 MSL	84 Parallel	160	-1.0	-300	43
d	30,895	1,600 MSL	86 Parallel	160	-2.9	-800	114
e	0	25 AGL	86 Parallel	160			



Flight Profile 608, ADAIR Med Noise - Straight In Arrival
ADAIR Type C Medium
Flight Track: 08A03 - Radar vectors to ILS runway 08 from Warning Areas

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:152,000 (1 inch = 12,600 feet)

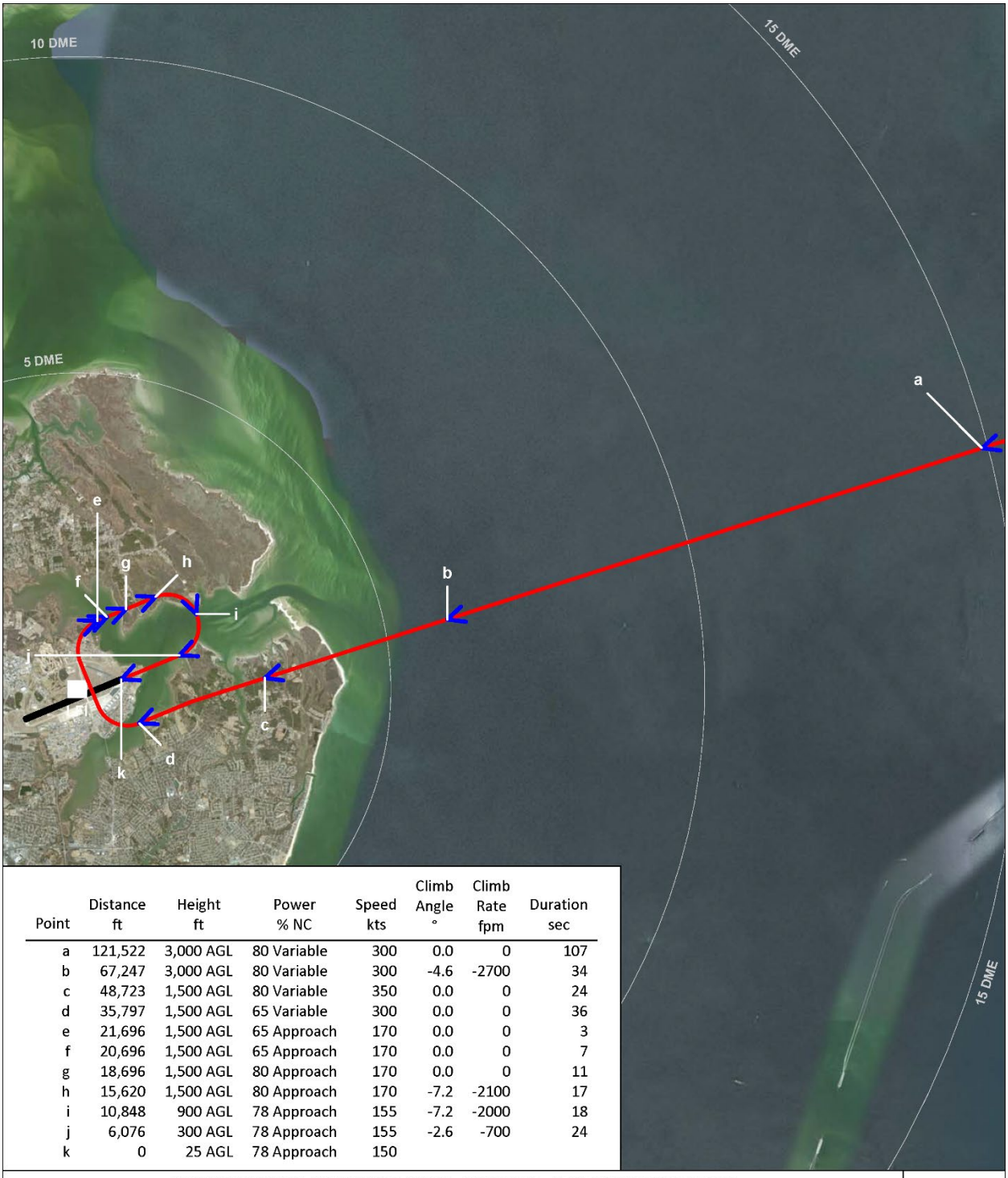


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	112,462	3,000 AGL	80 Variable	300	0.0	0	97
b	63,383	3,000 AGL	80 Variable	300	-4.7	-2700	33
c	45,160	1,500 AGL	80 Variable	350	0.0	0	23
d	32,786	1,500 AGL	65 Variable	300	0.0	0	28
e	21,723	1,500 AGL	65 Approach	170	0.0	0	3
f	20,723	1,500 AGL	65 Approach	170	0.0	0	7
g	18,723	1,500 AGL	80 Approach	170	0.0	0	11
h	15,620	1,500 AGL	80 Approach	170	-7.2	-2100	17
i	10,848	900 AGL	78 Approach	155	-7.2	-2000	18
j	6,076	300 AGL	78 Approach	155	-2.6	-700	24
k	0	25 AGL	78 Approach	150			

Flight Profile 615, ADAIR Med Noise - OH Break - Arrival
ADAIR Type C Medium
Flight Track: 26A40 - Straight-in arrival to runway 26 (1st ship)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,700 feet)

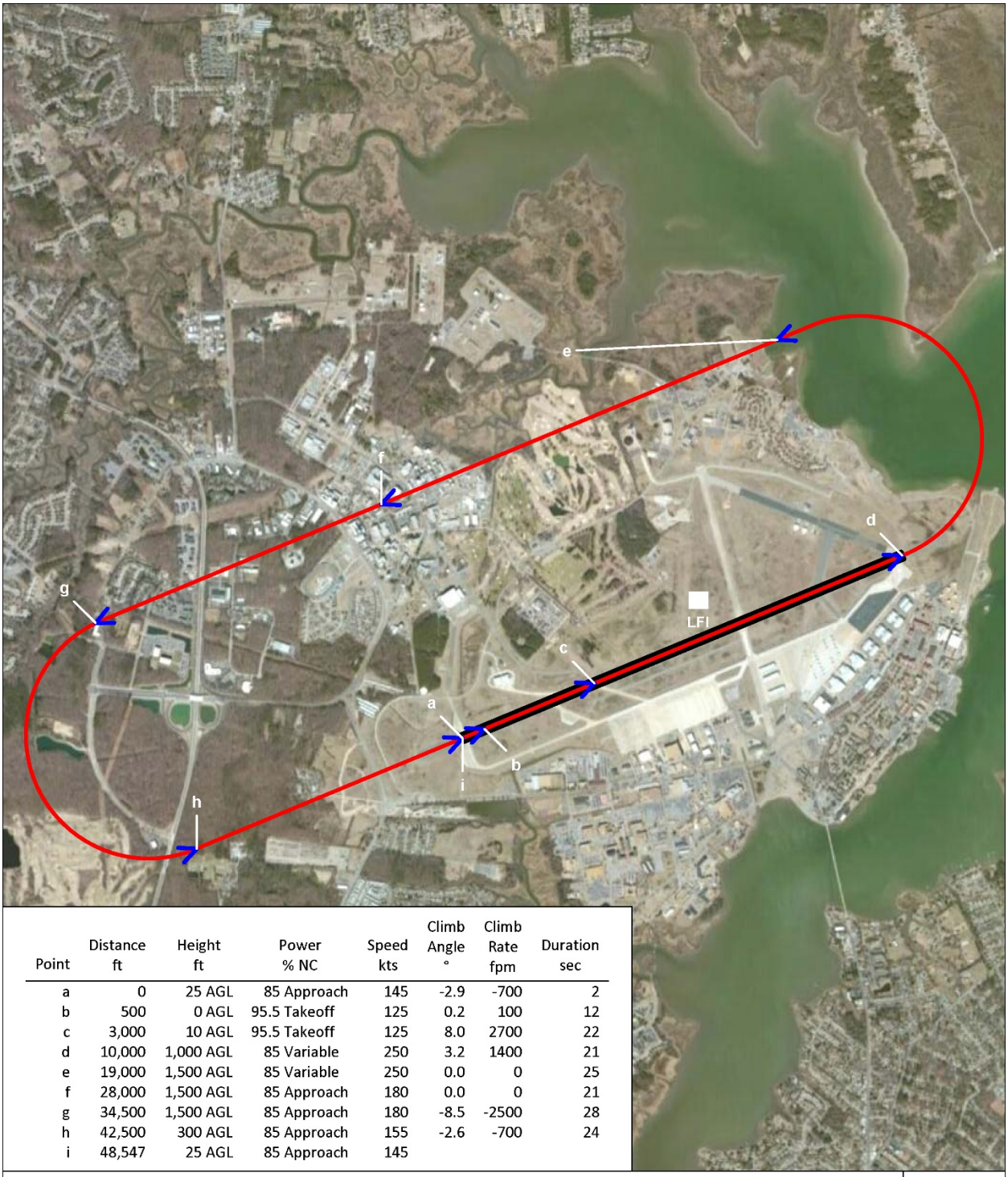


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	121,522	3,000 AGL	80 Variable	300	0.0	0	107
b	67,247	3,000 AGL	80 Variable	300	-4.6	-2700	34
c	48,723	1,500 AGL	80 Variable	350	0.0	0	24
d	35,797	1,500 AGL	65 Variable	300	0.0	0	36
e	21,696	1,500 AGL	65 Approach	170	0.0	0	3
f	20,696	1,500 AGL	65 Approach	170	0.0	0	7
g	18,696	1,500 AGL	80 Approach	170	0.0	0	11
h	15,620	1,500 AGL	80 Approach	170	-7.2	-2100	17
i	10,848	900 AGL	78 Approach	155	-7.2	-2000	18
j	6,076	300 AGL	78 Approach	155	-2.6	-700	24
k	0	25 AGL	78 Approach	150			

Flight Profile 616, ADAIR Med Noise - OH Break - Arrival Offset Wingman
ADAIR Type C Medium
Flight Track: 26A40-2 - Straight-in arrival to runway 26 (2nd ship tactical)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:137,000 (1 inch = 11,400 feet)

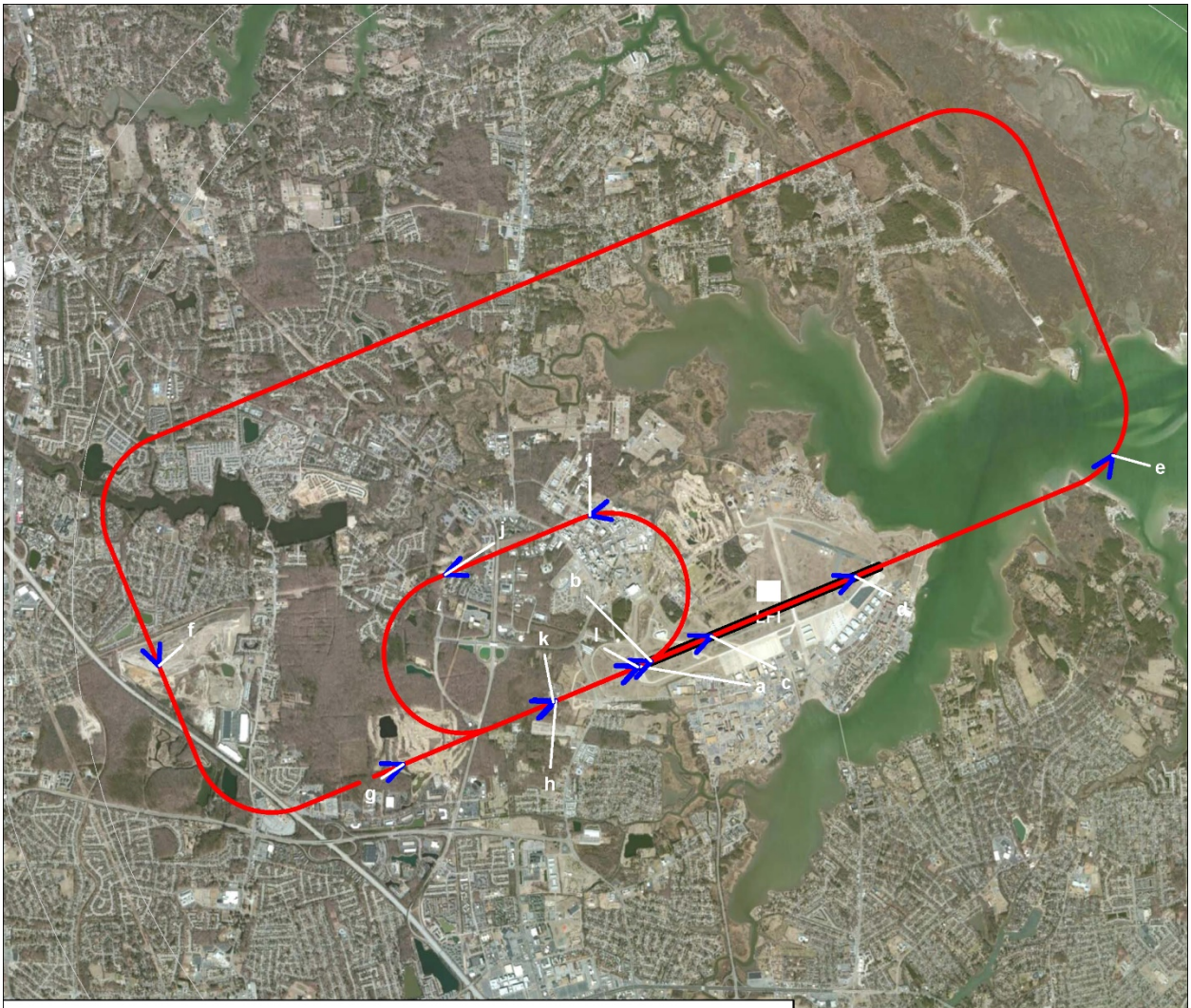


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	25 AGL	85 Approach	145	-2.9	-700	2
b	500	0 AGL	95.5 Takeoff	125	0.2	100	12
c	3,000	10 AGL	95.5 Takeoff	125	8.0	2700	22
d	10,000	1,000 AGL	85 Variable	250	3.2	1400	21
e	19,000	1,500 AGL	85 Variable	250	0.0	0	25
f	28,000	1,500 AGL	85 Approach	180	0.0	0	21
g	34,500	1,500 AGL	85 Approach	180	-8.5	-2500	28
h	42,500	300 AGL	85 Approach	155	-2.6	-700	24
i	48,547	25 AGL	85 Approach	145			

Flight Profile 630, ADAIR Med Noise - CLOSED PATTERN
ADAIR Type C Medium
Flight Track: 08C01 - F-22 inside downwind to runway 08

0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000

Scale in Feet 1:29,700 (1 inch = 2,480 feet)



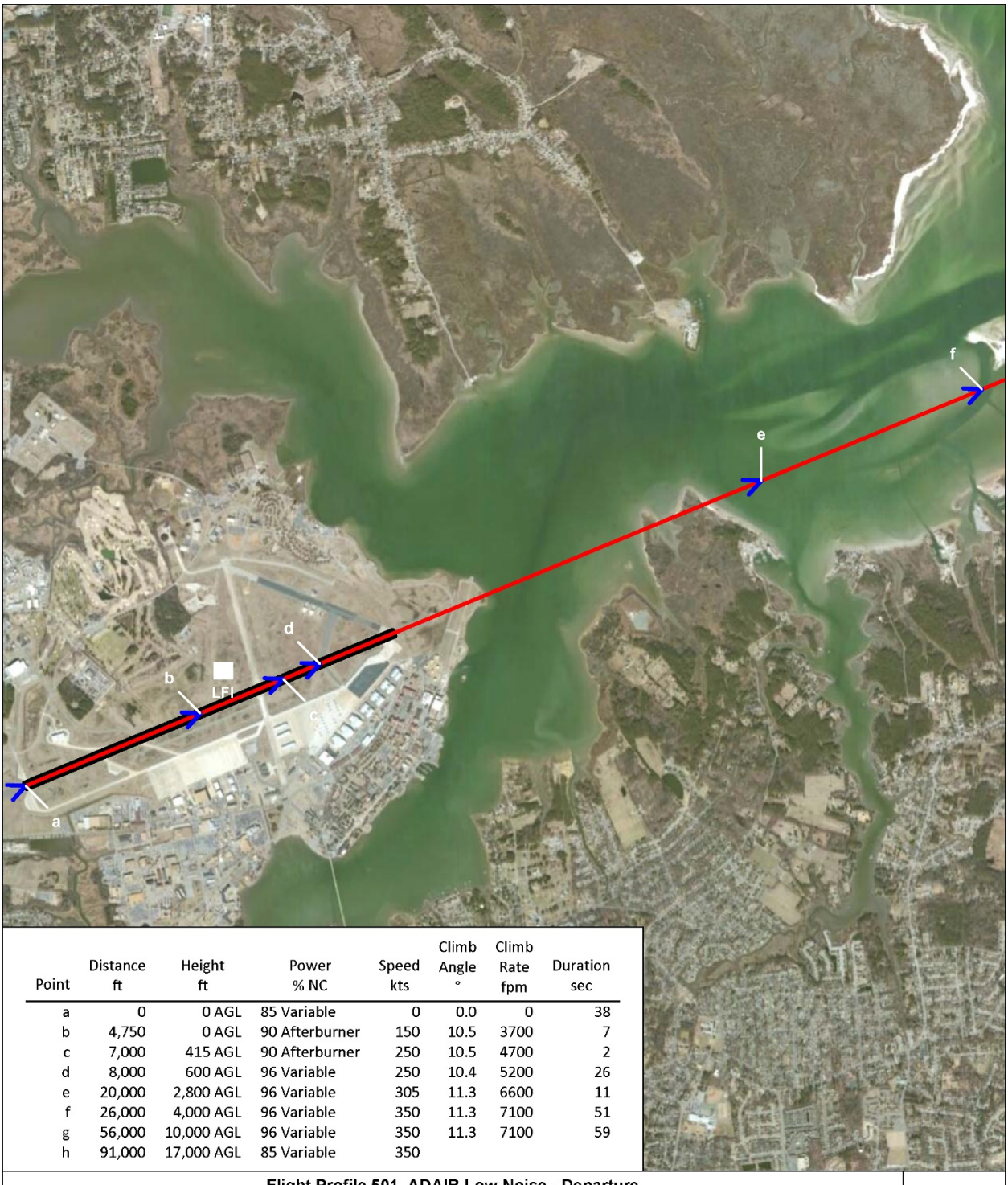
Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	50 AGL	85 Approach	145	-5.7	-1400	2
b	500	0 AGL	95.5 Takeoff	125	0.2	100	8
c	3,000	10 AGL	95.5 Takeoff	250	9.4	4200	14
d	9,000	1,000 AGL	95.5 Takeoff	250	8.3	4100	24
e	20,000	2,600 AGL	85 Max Endurance	300	0.0	0	117
f	79,000	2,600 AGL	85 Max Endurance	300	-4.4	-2300	26
g	92,000	1,600 AGL	85 Variable	300	0.0	0	13
h	98,353	1,600 AGL	85 Variable	300	0.0	0	28
i	110,919	1,600 AGL	85 Variable	240	0.0	0	17
j	116,919	1,600 AGL	85 Approach	180	-5.9	-1800	44
k	129,486	300 AGL	85 Approach	155	-4.1	-1100	14
l	133,000	50 AGL	85 Approach	145			

Flight Profile 634, ADAIR Medium Noise - CLOSED PATTERN - With Break - REPRESENTATIVE
ADAIR Type C Medium
Flight Track: 08C06 - outside downwind to runway 08

0 4,000 8,000 12,000 16,000 20,000

Scale in Feet 1:64,200 (1 inch = 5,350 feet)

B.1.3.2.3 Contract ADAIR Low Noise FAS 39 Gripen (F-16A Surrogate)

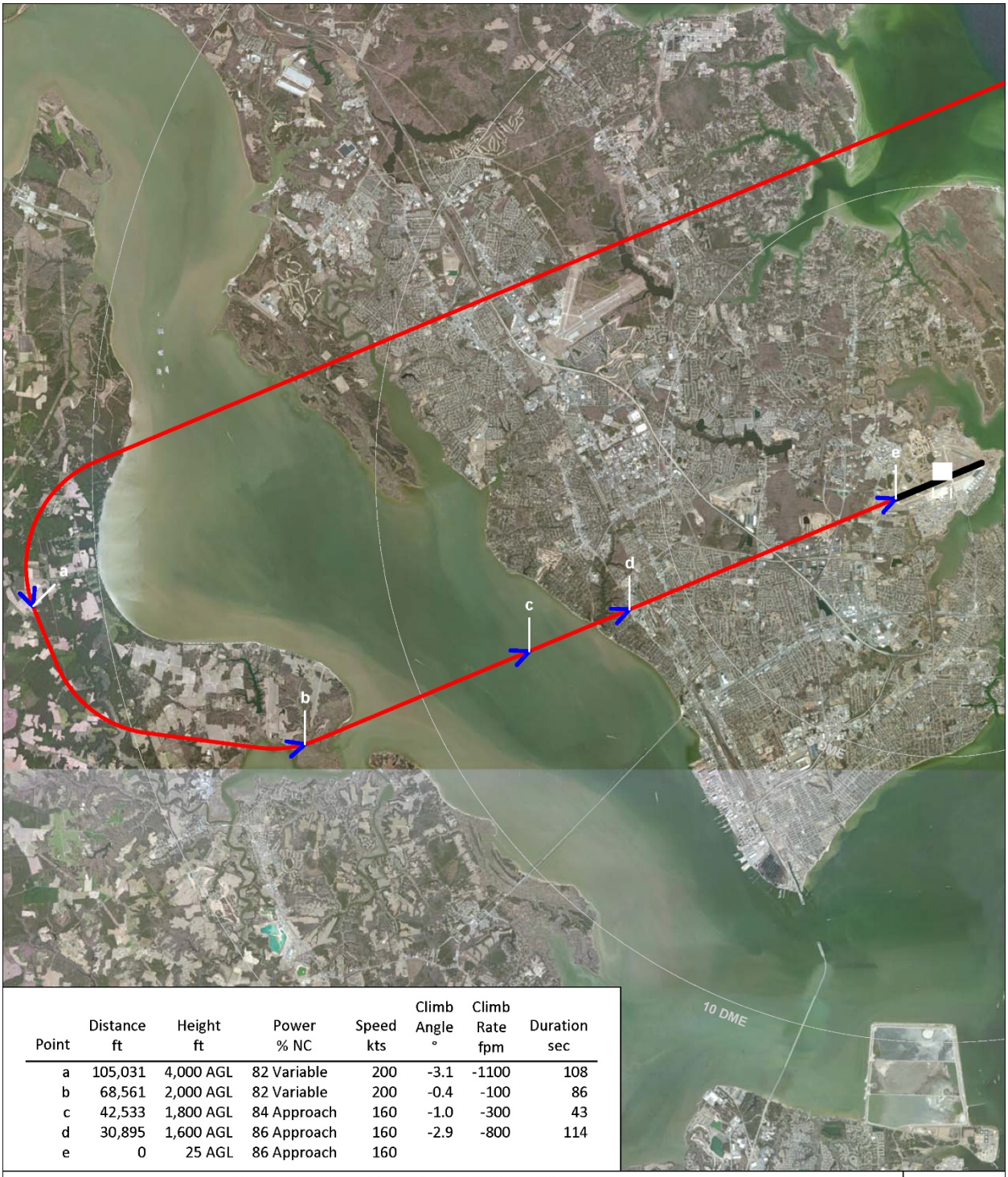


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	0 AGL	85 Variable	0	0.0	0	38
b	4,750	0 AGL	90 Afterburner	150	10.5	3700	7
c	7,000	415 AGL	90 Afterburner	250	10.5	4700	2
d	8,000	600 AGL	96 Variable	250	10.4	5200	26
e	20,000	2,800 AGL	96 Variable	305	11.3	6600	11
f	26,000	4,000 AGL	96 Variable	350	11.3	7100	51
g	56,000	10,000 AGL	96 Variable	350	11.3	7100	59
h	91,000	17,000 AGL	85 Variable	350			

Flight Profile 501, ADAIR Low Noise - Departure
ADAIR Type C Low
Flight Track: 08D01 - straight out IFR off runway 08

0 2,000 4,000 6,000 8,000 10,000

Scale in Feet 1:35,500 (1 inch = 2,960 feet)

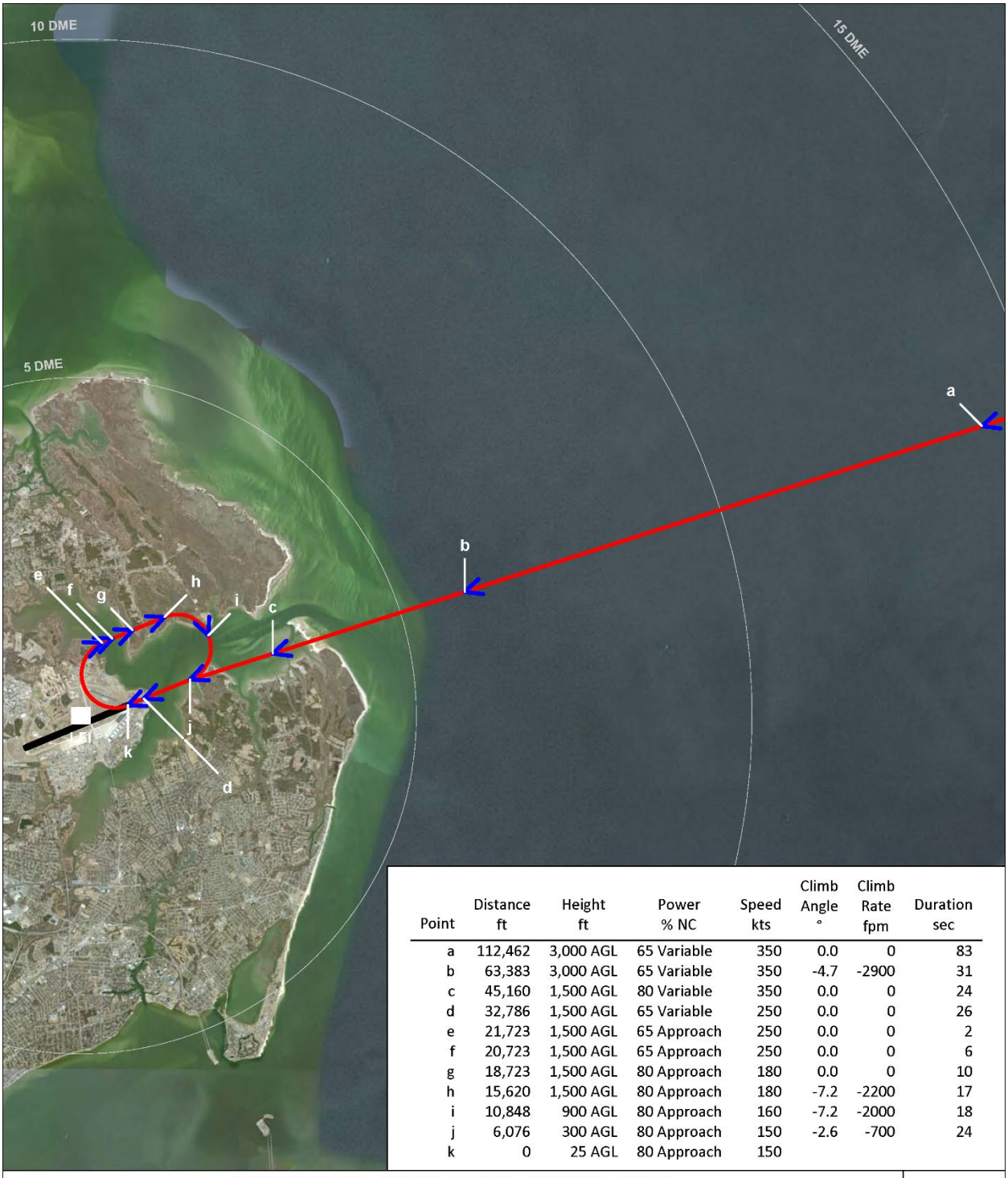


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	105,031	4,000 AGL	82 Variable	200	-3.1	-1100	108
b	68,561	2,000 AGL	82 Variable	200	-0.4	-100	86
c	42,533	1,800 AGL	84 Approach	160	-1.0	-300	43
d	30,895	1,600 AGL	86 Approach	160	-2.9	-800	114
e	0	25 AGL	86 Approach	160			

Flight Profile 508, ADAIR Low Noise - Straight In Arrival
ADAIR Type C Low
Flight Track: 08A03 - Radar vectors to ILS runway 08 from Warning Areas

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:152,000 (1 inch = 12,600 feet)

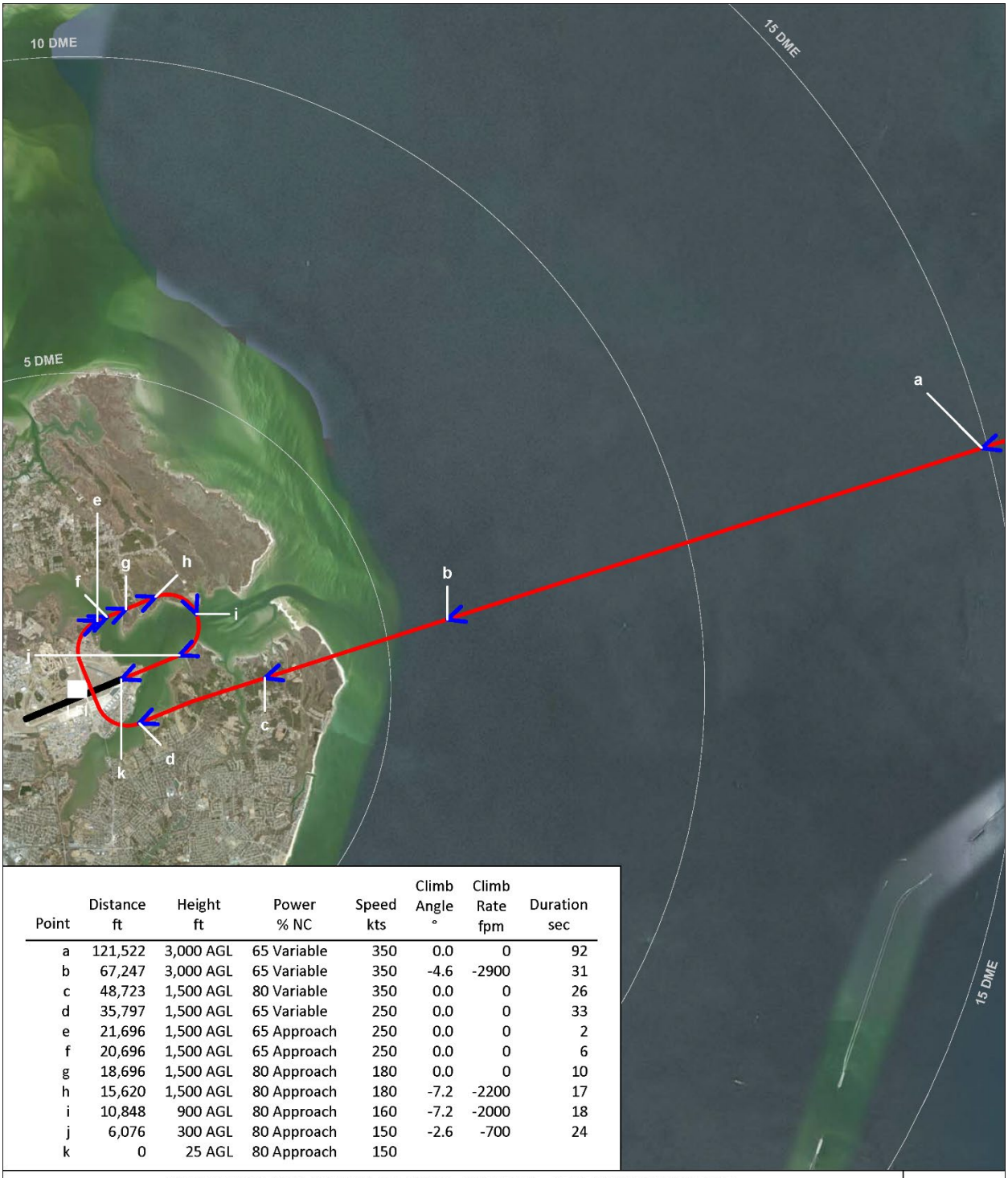


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	112,462	3,000 AGL	65 Variable	350	0.0	0	83
b	63,383	3,000 AGL	65 Variable	350	-4.7	-2900	31
c	45,160	1,500 AGL	80 Variable	350	0.0	0	24
d	32,786	1,500 AGL	65 Variable	250	0.0	0	26
e	21,723	1,500 AGL	65 Approach	250	0.0	0	2
f	20,723	1,500 AGL	65 Approach	250	0.0	0	6
g	18,723	1,500 AGL	80 Approach	180	0.0	0	10
h	15,620	1,500 AGL	80 Approach	180	-7.2	-2200	17
i	10,848	900 AGL	80 Approach	160	-7.2	-2000	18
j	6,076	300 AGL	80 Approach	150	-2.6	-700	24
k	0	25 AGL	80 Approach	150			

Flight Profile 515, ADAIR Low Noise - OH Break - Arrival
ADAIR Type C Low
Flight Track: 26A40 - Straight-in arrival to runway 26 (1st ship)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000

Scale in Feet 1:128,000 (1 inch = 10,700 feet)

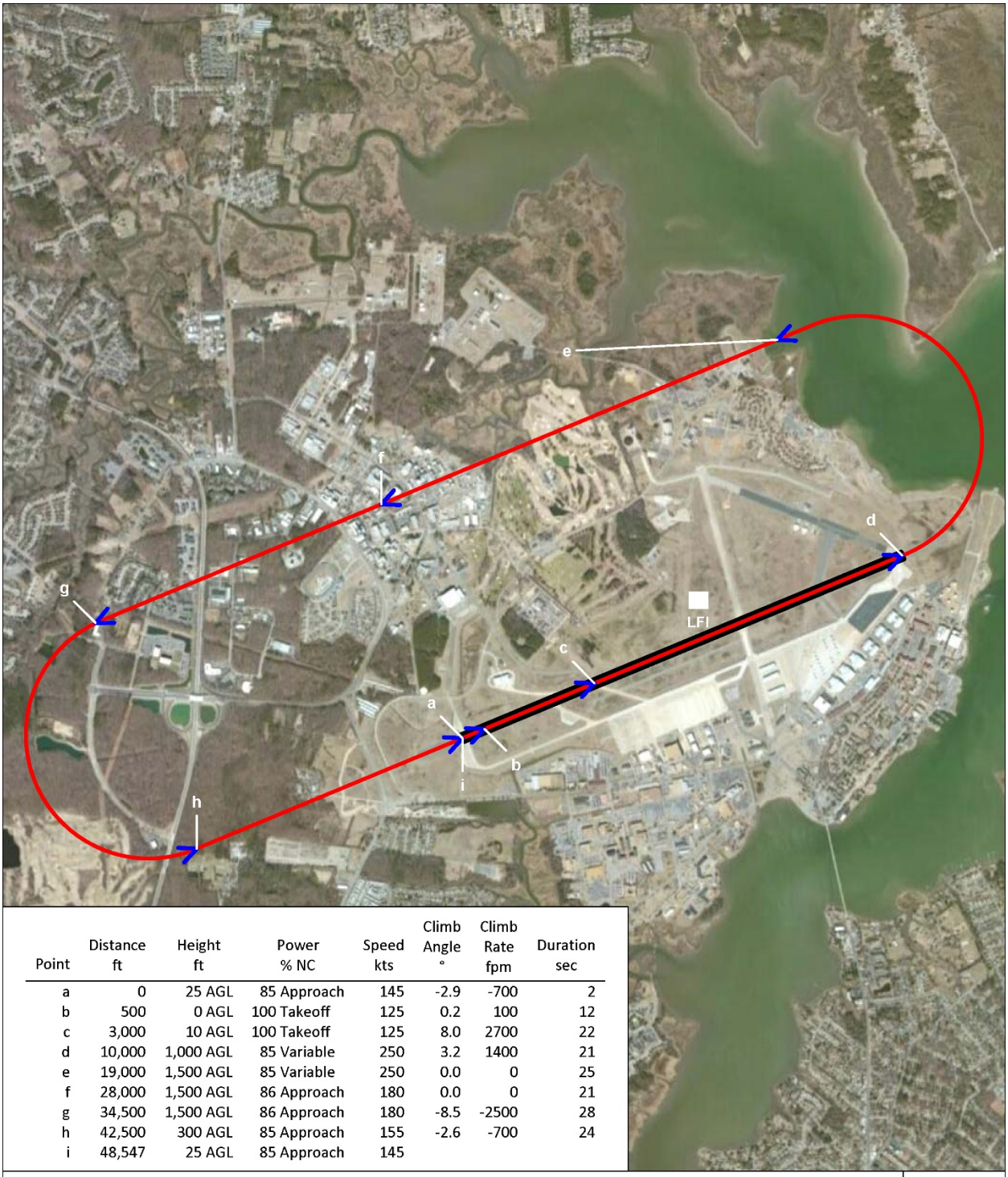


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	121,522	3,000 AGL	65 Variable	350	0.0	0	92
b	67,247	3,000 AGL	65 Variable	350	-4.6	-2900	31
c	48,723	1,500 AGL	80 Variable	350	0.0	0	26
d	35,797	1,500 AGL	65 Variable	250	0.0	0	33
e	21,696	1,500 AGL	65 Approach	250	0.0	0	2
f	20,696	1,500 AGL	65 Approach	250	0.0	0	6
g	18,696	1,500 AGL	80 Approach	180	0.0	0	10
h	15,620	1,500 AGL	80 Approach	180	-7.2	-2200	17
i	10,848	900 AGL	80 Approach	160	-7.2	-2000	18
j	6,076	300 AGL	80 Approach	150	-2.6	-700	24
k	0	25 AGL	80 Approach	150			

Flight Profile 516, ADAIR Low Noise - OH Break - Arrival Offset Wingman
ADAIR Type C Low
Flight Track: 26A40-2 - Straight-in arrival to runway 26 (2nd ship tactical)

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000

Scale in Feet 1:137,000 (1 inch = 11,400 feet)

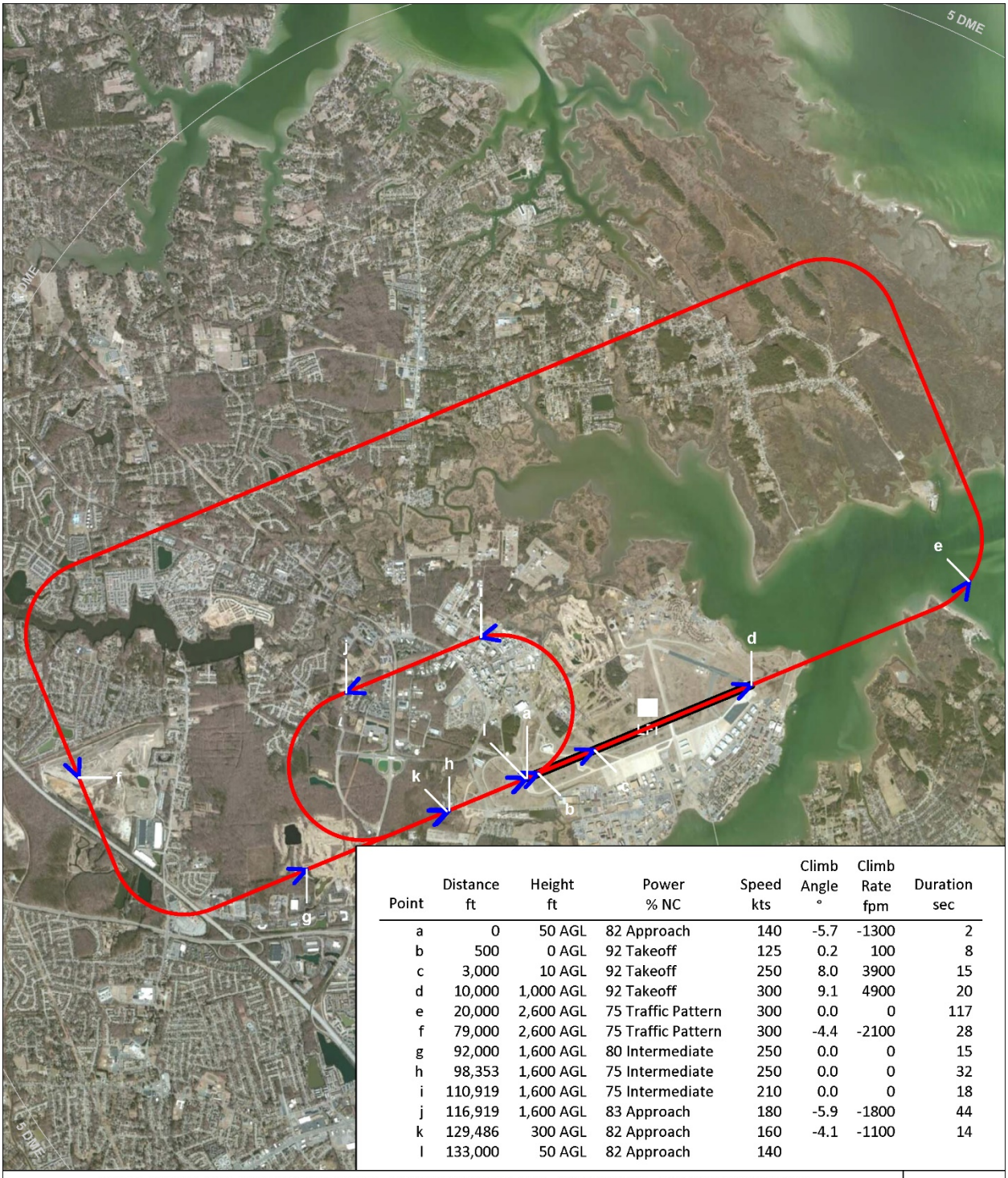


Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	25 AGL	85 Approach	145	-2.9	-700	2
b	500	0 AGL	100 Takeoff	125	0.2	100	12
c	3,000	10 AGL	100 Takeoff	125	8.0	2700	22
d	10,000	1,000 AGL	85 Variable	250	3.2	1400	21
e	19,000	1,500 AGL	85 Variable	250	0.0	0	25
f	28,000	1,500 AGL	86 Approach	180	0.0	0	21
g	34,500	1,500 AGL	86 Approach	180	-8.5	-2500	28
h	42,500	300 AGL	85 Approach	155	-2.6	-700	24
i	48,547	25 AGL	85 Approach	145			

Flight Profile 530, ADAIR Med Noise - CLOSED PATTERN
ADAIR Type C Low
Flight Track: 08C01 - F-22 inside downwind to runway 08

0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000

Scale in Feet 1:29,700 (1 inch = 2,480 feet)



Point	Distance ft	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0	50 AGL	82 Approach	140	-5.7	-1300	2
b	500	0 AGL	92 Takeoff	125	0.2	100	8
c	3,000	10 AGL	92 Takeoff	250	8.0	3900	15
d	10,000	1,000 AGL	92 Takeoff	300	9.1	4900	20
e	20,000	2,600 AGL	75 Traffic Pattern	300	0.0	0	117
f	79,000	2,600 AGL	75 Traffic Pattern	300	-4.4	-2100	28
g	92,000	1,600 AGL	80 Intermediate	250	0.0	0	15
h	98,353	1,600 AGL	75 Intermediate	250	0.0	0	32
i	110,919	1,600 AGL	75 Intermediate	210	0.0	0	18
j	116,919	1,600 AGL	83 Approach	180	-5.9	-1800	44
k	129,486	300 AGL	82 Approach	160	-4.1	-1100	14
l	133,000	50 AGL	82 Approach	140			

Flight Profile 534, ADAIR Low Noise - CLOSED PATTERN - With Break - REPRESENTATIVE
ADAIR Type C Low
Flight Track: 08C06 - outside downwind to runway 08

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000

Scale in Feet 1:58,200 (1 inch = 4,850 feet)

B.1.4 Ground/Maintenance Run-ups

This section details the number, type, and duration of the ground and maintenance engine run-up operations at the airfield. Because the ADAIR aircraft maintenance would be doing major maintenance off site, the only ground operations that are expected to increase with the addition of contract ADAIR aircraft would be the preflight run-up checks, postflight idling, and trim tests. **Figure B-16** shows the location of all the static run-up locations at JBLE-Langley. The proposed location for contract ADAIR aircraft parking is also noted on the figure. The locations near the ends of the runway are for the arming and dearming of the aircraft. The trim pad is where trim test operations for contract ADAIR aircraft would be performed. **Table B-9** details the number, type, and duration of the on-field maintenance operations.

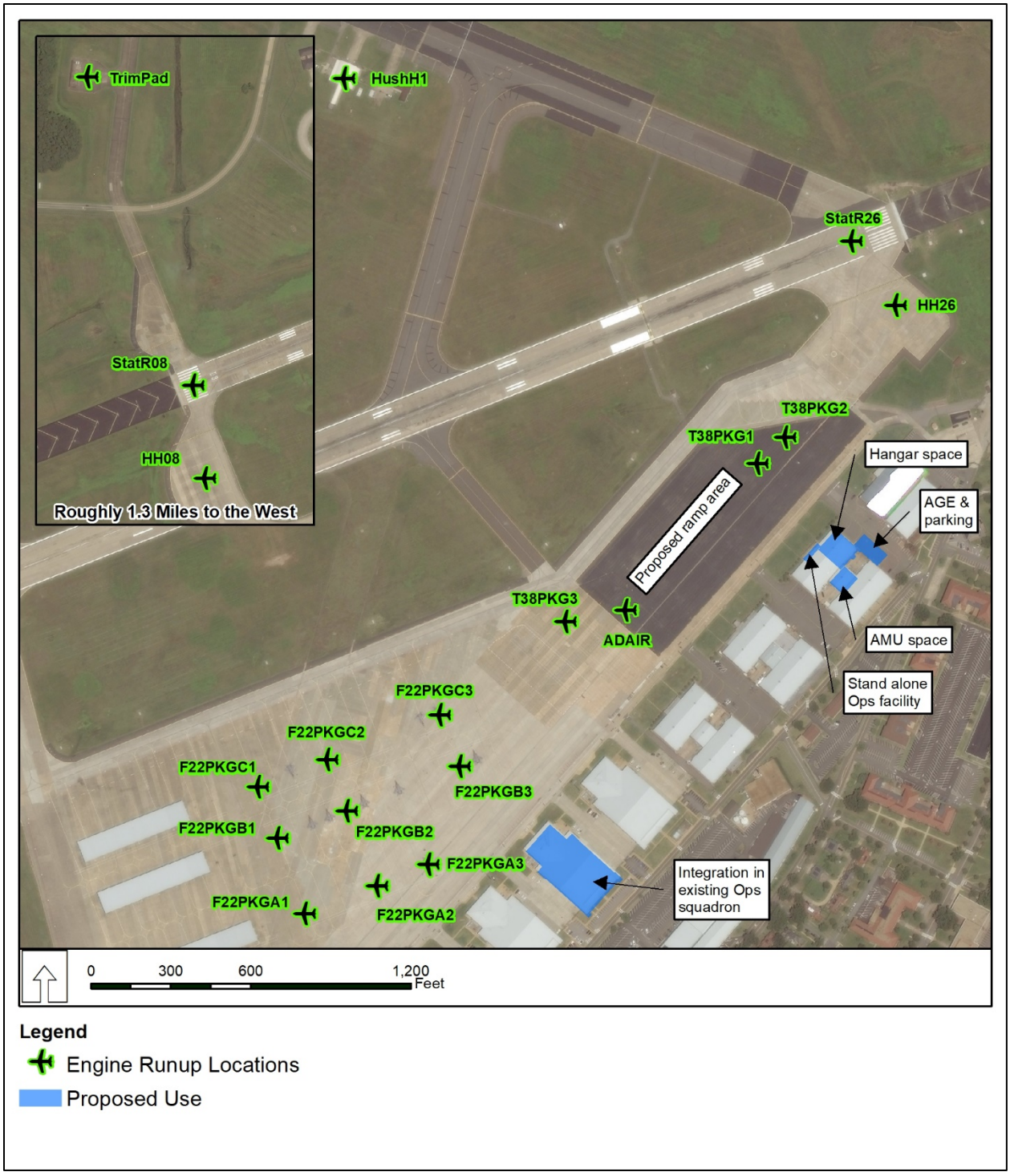


Figure B-16. Static Operations Locations at Joint Base Langley-Eustis, Langley Air Force Base.

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Table B-9
Location, Type, and Duration of Ground/Maintenance Run-Up Operations at Joint Base Langley-Eustis, Langley Air Force Base

Aircraft Type	Test Name	Run-up Pad ID	Percent Pad Used	Magnetic Heading (degrees)	Annual Events			Modeled Power Setting	Duration (Minutes) at Power Setting Per Event	Number of Engines Running Each Event
					Ops	Percent Day (0700-2200)	Percent Night (2200-0700)			
F-22	Diagnostics	F22_PKGA1, A2, A3 F22_PKGB1, B2, B3 F22_PKGC1, C2, C3	11.1% each	168 348 168	311	95%	5%	10% ETR	30	2
								80% ETR	10	1
	Ops Check: Regular	F22_PKGA1, A2, A3 F22_PKGB1, B2, B3 F22_PKGC1, C2, C3	11.1% each	168 348 168	846	67%	33%	10% ETR	15	2
	Ops Check: 80%	F22_PKGA1, A2, A3 F22_PKGB1, B2, B3 F22_PKGC1, C2, C3	11.1% each	168 348 168	92	95%	5%	10% ETR	20	2
								80% ETR	15	2
	Parking	F22_PKGA1, A2, A3 F22_PKGB1, B2, B3 F22_PKGC1, C2, C3	11.1% each	168 348 168	2,427	99%	1%	10% ETR	60	2
	Hush House: Installed Run	Hush H1	100%	30	28	100%	0%	63% RPM	15	1
								80% RPM	30	1
								94% RPM	9	1
								AB	45 sec	1
								63% RPM	15	1
	Hush House: Uninstalled Run	Hush H1	100%	30	89	50%	50%	63% RPM	5	1
								80% RPM	10	1
								63% RPM	7	1
								94% RPM	6	1
								AB	45 sec	1
								63% RPM	7	1
	Hush House: AB Check	Hush H1	100%	30	265	67%	33%	10% RPM	10	1
								80% RPM	8	1
								AB	45 sec	1
								80% RPM	40	2
								10% RPM	10	2
T-38C	Engine Wash	T38_PKG3	100%	240	541	100%	0%	48% RPM Idle	10	2
	Trims and Functional Runs	T38_PKG3	100%	240	116	100%	0%	48% RPM Idle	30	2
								92% RPM	15 sec	2
	Leak Checks, Engine Starts, etc.	T38_PKG3	100%	240	271	100%	0%	75% RPM	10	2
	Misc maint. Procedures (leak checks, ops checks, troubleshooting etc)	T38_PKG1	50%	10	118	97%	3%	48% RPM Idle	10	2
								70% RPM	2	2
		T38_PKG2	50%	290		97%	3%	48% RPM Idle	10	2
								70% RPM	2	2
ADAIR Category C	Pre/Postflight check/cooldown	ADAIR Parking	100%	0	4,100	99%	1%	Idle	20	1 or 2
	Trim[1]	Trim Pad	100%	315	288	100%	0%	Idle	12	1
								Approach	27	
								Intermediate	9	
								Military	9	
								Afterburner	3	

Notes:
[1] ACAM defaults assumed for ADAIR aircraft. Expecting 14 ADAIR aircraft.

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APPENDIX C

AIR QUALITY

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Appendix C-1

Air Conformity Applicability Analysis

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C.1 AIR QUALITY

This appendix presents an overview of the Clean Air Act (CAA) and the relevant state of Virginia air quality regulations/standards. It also presents calculations, including the assumptions used for the air quality analyses. The Air Conformity Applicability Model analysis included in the Draft Joint Base Langley-Eustis (JBLE)-Langley Combat Air Forces Adversary Air Draft Environmental Assessment (EA), July 2019, was conducted using default settings resulting in artificially high nitrogen oxides for the High Scenario. Revised modeling was performed for the Final EA to include proposed site-specific details. Results of the modeling are presented in the Air Quality Sections of the Final EA.

C.1.1 Air Quality Program Overview

To protect public health and welfare, the US Environmental Protection Agency (USEPA) has developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for six "criteria" pollutants (based on health-related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (40 Code of Federal Regulations [CFR] Part 50).

The 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. The Virginia Department of Environmental Quality (VDEQ) oversees the state's air pollution control program under the authority of the federal CAA and amendments, federal regulations, and state laws. Virginia has adopted the federal NAAQS (9VAC5 Chapter 30). These standards are shown in **Table C-1**.

VDEQ operates and maintains an ambient air monitoring network that uses the methods and procedures approved by the USEPA. Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than (attainment) the NAAQS, worse than (nonattainment) the NAAQS, and unclassifiable. The areas that cannot be classified (on the basis of available information) as meeting or not meeting the NAAQS for a particular pollutant are "unclassifiable" and are treated as attainment until proven otherwise. Attainment areas can be further classified as "maintenance" areas, which are areas previously classified as nonattainment but where air pollutant concentrations have been successfully reduced to below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS.

Section 176(c) (1) of the CAA contains legislation that ensures federal activities conform to relevant State Implementation Plans (SIPs) and thus do not hamper local efforts to control air pollution. Conformity to a SIP is defined as conformity to a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. As such, a general conformity analysis is required for areas of nonattainment or maintenance where a federal action is proposed.

The action can be shown to conform by demonstrating that the total direct and indirect emissions are below the *de minimis* levels (**Table C-2**), and/or showing that the Proposed Action emissions are within the State- or Tribe-approved budget of the facility as part of the SIP or Tribal Implementation Plan (USEPA, 2010). A conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of that pollutant equal or exceed its *de minimis* rates (9VAC5-160-30).

Direct emissions are those that occur as a direct result of the action. For example, emissions from new equipment that are a permanent component of the completed action (e.g., boilers, heaters, generators, paint booths) are considered direct emissions. Indirect emissions are those that occur at a later time or at

a distance from the Proposed Action. For example, increased vehicular/commuter traffic because of the action is considered an indirect emission. Construction emissions must also be considered. For example, the emissions from vehicles and equipment used to clear and grade building sites, build new buildings, and construct new roads must be evaluated. These types of emissions are considered direct.

Table C-1
National Ambient Air Quality Standards

Pollutant	Standard Value[7]		Standard Type
Carbon Monoxide (CO)			
8-hour average	9 ppm	(10 mg/m^3)	Primary
1-hour average	35 ppm	(40 mg/m^3)	Primary
Nitrogen Dioxide (NO_2)			
Annual arithmetic mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
1-hour average[1]	0.100 ppm	(188 µg/m^3)	Primary
2015 Ozone (O_3)			
8-hour average[2]	0.070 ppm	(137 µg/m^3)	Primary and Secondary
2008 Ozone (O_3)			
8-hour average[3]	0.075 ppm	-	Primary and Secondary
1997 Ozone (O_3)			
8-hour average[3]	0.08 ppm	-	Primary and Secondary
Lead (Pb)			
3-month average[4]		0.15 µg/m^3	Primary and Secondary
Particulate ≤10 Micrometers (PM_{10})			
24-hour average[5]		150 µg/m^3	Primary and Secondary
Particulate ≤2.5 Micrometers ($PM_{2.5}$)			
Annual arithmetic mean[5]		12 µg/m^3	Primary
Annual arithmetic mean[5]		15 µg/m^3	Secondary
24-hour average[5]		35 µg/m^3	Primary and Secondary
Sulfur Dioxide (SO_2)			
1-hour average[6]	0.075 ppm	(196 µg/m^3)	Primary
3-hour average[6]	0.5 ppm	(1,300 µg/m^3)	Secondary

Source: USEPA, 2016, 2018

Notes:
1 In February 2010, the USEPA established a new 1-hour standard for NO_2 at a level of 0.100 ppm, based on the 3-year average of the 98th percentile of the yearly distribution concentration, to supplement the then-existing annual standard.
2 In October 2015, the USEPA revised the level of the 8-hour standard to 0.070 ppm, based on the annual 4th highest daily maximum concentration, averaged over 3 years; the regulation became effective on 28 December 2015. The previous (2008) standard of 0.075 ppm remains in effect for some areas. A 1-hour standard no longer exists.
3 In November 2008, USEPA revised the primary lead standard to 0.15 µg/m^3. USEPA revised the averaging time to a rolling 3-month average.
4 Annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years.
5 In October 2006, USEPA revised the level of the 24-hour $PM_{2.5}$ standard to 35 µg/m^3 and retained the level of the annual $PM_{2.5}$ standard at 15 µg/m^3. In 2012, USEPA split standards for primary and secondary annual $PM_{2.5}$. All are averaged over 3 years, with the 24-hour average determined at the 98th percentile for the 24-hour standard. USEPA retained the 24-hour primary standard and revoked the annual primary standard for PM_{10}.
6 In 2012, the USEPA retained a secondary 3-hour standard, which is not to be exceeded more than once per year. In June 2010, USEPA established a new 1-hour SO_2 standard at a level of 75 ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.
7 Parenthetical value is an approximately equivalent concentration for NO_2, O_3, and SO_2.

µg/m^3 = microgram(s) per cubic meter; mg/m^3 = milligram(s) per cubic meter; ppb = part(s) per billion; ppm = part(s) per million; USEPA = United States Environmental Protection Agency

Table C-2
General Conformity Rule *De minimis* Emission Thresholds

Pollutant	Attainment Classification	Tons per year
Ozone (VOC and NO_x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region (applicable to Joint Base Langley-Eustis, Langley Air Force Base)	100
Ozone (NO_x)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon Monoxide, SO_2 and NO_2	All nonattainment and maintenance	100
PM_{10}	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
$PM_{2.5}$ Direct emissions, SO_2, NO_x , VOC, and ammonia	All nonattainment and maintenance	100
Lead	All nonattainment and maintenance	25

Source: USEPA, 2017

NO_2 = nitrogen dioxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates equal to or less than 2.5 microns in diameter; PM_{10} = particulates equal to or less than 10 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compound

Each state is required to develop a SIP that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds; that is, 100 or 250 tons/year based on the source's industrial category. These thresholds are applicable to stationary sources. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. **Table C-3** provides a tabular listing of the PSD significant emissions rate (SER) thresholds for selected criteria pollutants (USEPA, 1990). Air quality modeling analysis for a PSD proposed facility is required to demonstrate that its emissions of specific pollutants will not cause or significantly contribute to a violation of any ambient air quality standard.

Table C-3
Criteria Pollutant Significant Emissions Rate Increases Under Prevention of Significant Deterioration Regulations

Pollutant	Significant Emission Rate (ton/year)
PM_{10}	15
$PM_{2.5}$	10
Total Suspended Particulate	25
SO_2	40
NO_x	40
Ozone (Volatile Organic Compounds)	40
CO	100

Source: Title 40 CFR Part 52 Subpart A, § 52.21

CO = carbon monoxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulates equal to or less than 2.5 microns in diameter; PM_{10} = particulates equal to or less than 10 microns in diameter; SO_2 = sulfur dioxide

The goals of the PSD program are to (1) ensure economic growth while preserving existing air quality; (2) protect public health and welfare from adverse effects that might occur even at pollutant levels better than the NAAQS; and (3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using Best Available Control Technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in **Table C-4**. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. There are no Class I areas near the Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley). In addition, there are negligible project-related emissions from new or modified stationary sources; therefore, PSD does not apply.

Table C-4
Federal Allowable Pollutant Concentration Increases Under Prevention of Significant Deterioration Regulations

Pollutant	Averaging Time	Maximum Allowable Concentration ($\mu g/m^3$)		
		Class I	Class II	Class III
$PM_{2.5}$	Annual	1	4	8
	24-hour	2	9	18
PM_{10}	Annual	4	17	34
	24-hour	8	30	60
SO_2	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO_2	Annual	2.5	25	50

Source: Title 40 CFR Part 52 Subpart A, § 52.21

$\mu g/m^3$ = microgram(s) per cubic meter; NO_2 = nitrogen dioxide; $PM_{2.5}$ = particulates equal to or less than 2.5 microns in diameter; PM_{10} = particulates equal to or less than 10 microns in diameter; SO_2 = sulfur dioxide

The Air Quality Monitoring Program monitors ambient air throughout the state. The purpose is to monitor, assess and provide information on statewide ambient air quality conditions and trends as specified by the state and federal CAA. The Air Quality Monitoring Program works in conjunction with local air pollution agencies and some industries, measuring air quality throughout the states.

The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards. Also included are areas where the ambient standards are being met, but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The USEPA has specific requirements for a minimum number of monitoring sites, known as National Air Monitoring Sites. Virginia has augmented these with additional sites, called State and Local Air Monitoring Sites, to provide additional air quality data for VDEQ needs. Locations of these monitoring sites are determined by factors such as emissions sources, population density, permitting needs, modeling results, and site accessibility.

The result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

C.1.2 Assumptions

The following are assumptions were used in the air quality analysis for the proposed and alternative actions:

1. No construction activities would be associated with Alternative 1 or 2 at JBLE-Langley. This includes no demolition, earth moving, hauling, or paving. Some minor interior building fabrication possible but affected square footage is too small to result in outdoor air quality impacts.
2. No installation of new boilers or generators.
3. No new storage tanks would be installed - additional Jet A fuel needed by contractor aircraft will be calculated based on engine type, number of sorties, and engine fuel consumption rate. Volatile organic compound (VOC) emissions are based upon the additional fuel handled using the emission estimation procedures in AP-42, Section 7.1.3. Because Jet-A has a very low volatility, the additional fueling operations will result in a minor increase in VOC emissions.
4. Air Force personnel would deliver fuel to the contractor at the airfield using tank trucks. Gas and diesel/Jet A fuel for the Contractor’s Aerospace Ground Equipment (AGE) and flight line special purpose vehicles will be obtained by contract adversary air (ADAIR) personnel from the base/Air Force.
5. Chaff and flares to be used by contractor would be stored using current facilities (additional/new ammunition storage facilities not needed).
6. No new Hush House/Engine Test Cell facilities would be installed and existing Hush House/Engine Test Cell facilities would not be used for ADAIR contractor aircraft.
7. No new paint booth facilities would be installed, and existing paint booths would not be used for ADAIR contractor aircraft.
8. Contractor may bring their own parts cleaner (or share already installed unit unknown at this time) - for either case it is assumed contractor use will be minimal - (no more than 0.5 gallon/month solvent used/lost).
9. Maintenance for contractor aircraft would be limited to minor repairs and minor routine maintenance/inspections (significant repairs, trim tests, schedule/phased maintenance and inspections to be conducted off-site).
10. For the purposes of modeling, ADAIR targeted performance is assumed to start in July 2019 with 10-year contract.
11. Contractor aircraft landing and takeoff (LTO) cycles - use/assume Air Conformity Applicability Model (ACAM) default "times in mode" to be conservative.

12. Assume once an aircraft is out of the LTO cycle, flight time to/from the warning areas (5 to 10 minutes) would be at an altitude greater than 3,000 feet (ft) above ground level causing negligible impacts to ground-level air quality.
13. Assume mixing height is 3,000 ft (this matches USEPA and Air Force Guidance).
14. Air Force training sorties would not increase or decrease as result of this action. Roles may change (i.e., the Air Force no longer need to play the adversary, but this will not change in any substantial way the number of Air Force sorties flown); thus, the change (increase) in emissions for air operations would be strictly due to the addition of the contract ADAIR aircraft and associated ground and maintenance activities.
15. Air Force use of engine test cells/hush house would not change as a result of the Proposed Action. No changes to Air Force trim tests was also assumed.
16. For the high air emission scenario, the surrogate for the MIG-29 is the F-15 with engine model F100-PW-100.
17. For the medium air emission scenario, the surrogate for the Mirage is the F-16 with engine model F110-GE-100. The use of the F-16C with engine model F100-PW-220 is the surrogate for Medium Noise scenario only.
18. For the low emission scenario represented by the F-5 aircraft there are two potential engine types. We have assumed J85-GE-13 for the engine model.
19. For contactor AGE and Auxiliary Power Units (APUs) - until the contractor is selected, what they would bring/use in terms of AGE and APUs is unknown; thus, ACAM defaults will be used based on the surrogate aircraft and engine type.
20. Assume contractor aircraft would engage in LTO cycles, and touch and go (TGO) or low approach activities only in the vicinity of the airfield.
21. Assume 5 percent of on-airfield daytime sorties would include multiple patterns for contractor proficiency.
22. It is unknown what contractor requirements would be for trim tests; thus, ACAM defaults will be assumed based on surrogate aircraft and engine type.
23. Assume all new ADAIR contractor personnel (pilots and maintenance staff) would live off-base and commute to the base 5 days per week. Will use ACAM defaults for commute distances.
24. All ADAIR training sorties would utilize chaff and flares. Only RR-188 chaff and M206 flares would be utilized (no other materials will be considered in the analysis).
25. Assume air quality impacts from chaff releases under actual flight conditions would be low and will have negligible impact on the PM_{10} and $PM_{2.5}$ NAAQS (1997 Report: *Environmental Effects of Self-protection Chaff and Flares*); thus, only the use of flares and impulse cartridges (if applicable) used at or below 3,000 ft will be considered in the air quality analysis. Flares used above 3,000 ft will disperse and not affect air quality in the lowest 3,000 ft above ground level (AGL)/above sea level (ASL).
26. All ADAIR related training at JBLE-Langley would occur in the Warning Areas (i.e., no Military Operations Areas [MOAs] would be used for ADAIR training).
27. Estimated amount of time each ADAIR contractor aircraft would spend within the Warning Area W-386 at or below 3,000 feet ASL is proportioned based on percent time spent between 500 to 4,000 ft. Assuming an average mission time of 40 minutes, the time spent at or below 3,000 ft ASL in W-386 would be 11.4 minutes (see **Table C-5**).
28. ACAM does not have separate inputs for time spent within a MOA or Warning Area. To represent the time spent at or below 3,000 ft, 11.4 minutes was assigned to climb out/intermediate power mode within the ACAM LTO input fields. No time was assigned to any other power modes, but default ACAM output also lists Trim Tests and TGOs; however, all inputs for these fields were set to zero (see **Table C-6**).
29. Assume the time spent below 3,000 ft would be the same for all sorties.
30. No changes to large force exercises baseline due to the addition of the proposed contract ADAIR.
31. No changes baseline Air Force aircraft operations (sorties) due to contract ADAIR.
32. No/little changes to transit and civilian AOPS due to contract ADAIR.
33. For consideration of potential air quality impacts, it is the volume of air extending up to the mixing height (3,000 feet AGL/ASL) and coinciding with the spatial distribution of the region of influence that is considered. Pollutants that are released above the mixing height typically would not disperse downward and thus would have little or no effect on ground level concentrations of pollutants. The

mixing height is the altitude at which the lower atmosphere undergoes mechanical or turbulent mixing, producing a nearly uniform air mass. The height of the mixing level determines the volume of air within which pollutants can disperse. Mixing heights at any one location or region can vary by the season and time of day, but for air quality applications an average mixing height of 3,000 ft AGL is an acceptable default value (40 CFR § 93.153[c][2]).

34. **Tables C-5** and **C-6** below show the data and assumptions used as input to ACAM for flight operations.

Table C-5
Airspace Assumptions and Air Conformity Applicability Model Data Inputs

Warning Area	Percent of Total Sorties	No. of Sorties in Airspace[1]	Minimum Mission Altitude	Total Mission Time (minutes) ≤3,000 ft AGL	Power Mode[3]
W-386	75	3,075	500 ft ASL	11.4[2]	Intermediate/Climb Out
	20	820	FL300	0	N/A
W-122 and W-72	5	205	500 ft ASL	11.4[2]	Intermediate/Climb Out

Notes:
[1] Based on 4,100 total sorties in Warning Areas (Source: CAF ADAIR EIS Calculator - NEPA 6)
[2] Based on 40 minutes per sortie and proportioned based on percent of time spent between 500 to 4,000 ft
Minutes @ 500 to 4,000 ft = 40 minutes * 40 percent (percent time in altitude range) = 16 minutes
Minutes @ 500 to 3,000 ft = 16 minutes - (16 minutes * 1,000 ft/3,500 ft) = 11.4 minutes
[3] ACAM does not have separate inputs for time spent within a Warning Area. To represent the time spent within a Warning Area, the expected flight time at or below 3,000 ft (11.4 minutes) was assigned to Intermediate/Climb out power mode within the ACAM LTO input fields. No time was assigned to any other power modes.

ACAM = Air Conformity Applicability Model; ADAIR = adversary air; AGL = above ground level; ASL = above sea level; CAF = Combat Air Forces; DOPAA = Description of Proposed Action and Alternatives; EIS = Environmental Impact Statement; FL = flight level (vertical altitude expressed in hundreds of feet); ft = feet; LTO = landing and takeoff; N/A = not applicable; NEPA = National Environmental Policy Act

Table C-6
Times in Mode[1] (minutes) for Aircraft Operations

Type of Operation	Number of Sorties	Taxi/Idle (out)	Takeoff		Climb Out	Approach	Taxi/Idle(in)
			Military	Afterburn			
LTO	4,100	18.5	0.2	0.2	0.8	3.5	11.3
TGO[2]	554	-	-		0.8	3.5	-

Notes:
[1] Given time in mode applicable to all emission scenarios (high, medium, and low)
[2] 5 percent of on-airfield daytime sorties (3,690) are expected to include multiple patterns for contractor proficiency. Each of those 5 percent sorties is assumed to include three TGO/low approaches.

LTO = landing and takeoff; TGO = touch and go

C.1.3 Regulatory Comparisons

The conformity requirement under CAA section 176(c), and the implementing regulations under 40 CFR Part 93, subpart B for general federal actions, requires federal agencies to demonstrate that their proposed activities would conform to the applicable SIP for attainment of the NAAQS. General conformity applies only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area equal or exceed annual *de minimis* thresholds identified in the rule, a formal conformity determination is required for that action. The thresholds are more restrictive as the severity of the nonattainment status of the region increases. The Council on Environmental Quality (CEQ) defines

significance in terms of context and intensity in 40 CFR § 1508.27. This requires that the significance of the action be analyzed with respect to the setting of the Proposed Action and based relative to the severity of the impact. The CEQ National Environmental Policy Act regulations (40 CFR § 1508.27[b]) provide 10 key factors to consider in determining an impact's intensity.

Emissions from the Proposed Action in the vicinity of the JBLE-Langley were assessed in Chapter 4 and compared to regional emissions and the applicable regulatory thresholds. An overview of ACAM inputs and the methodologies used to estimate emissions are summarized in **Appendix C-2** of this Air Quality summary report.

C.2 REFERENCES

USEPA. 1990. Office of Air Quality Planning and Standards. *Draft New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Permitting.* October.

USEPA. 2010. *40 CFR Parts 51 and 93, Revisions to the General Conformity Regulations*. 75 FR 14283, EPA-HQ-OAR-2006-0669; FRL-9131-7. 24 March.

USEPA. 2016. *NAAQS Table*. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. 20 December.

USEPA. 2017. *General Conformity: De minimis Tables*. <https://www.epa.gov/general-conformity/de-minimis-tables>. 04 August.

Appendix C-2

Detailed Air Conformity Applicablity Model Sample Report
(Airfield – High)

(For General Conformity Applicability Determination and National Environmental Policy Act Air Quality Assessment)

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1. General Information

- Action Location

Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Action Title: JBLE Combat Air Forces Adversary Air

- Project Number/s (if applicable):

- Projected Action Start Date: 7 / 2019

- Action Purpose and Need:

Combat Air Forces (CAF) pilots have to support adversary air (ADAIR) flying missions that have minimal training value to the CAF pilots themselves. ADAIR missions simulate an opposing force that provides a necessary and realistic combat environment during CAF training missions. Flying these ADAIR sorties requires the use of potential adversaries' tactics and procedures that may differ significantly from CAF tactics and procedures and therefore provides minimal CAF training while taking up valuable flying hours that could otherwise be spent on core training tasks. In many cases, minimal ADAIR missions, or none at all, have been available to support pilot training and have resulted in degraded readiness for CAF pilots who are expected to operate some of the most sophisticated weapons platforms in the world.

Contract ADAIR is proposed to fill ADAIR sorties and improve the quality of training and readiness of CAF pilots and allow the Air Force to recapitalize other valuable assets and training time. The contract ADAIR requirement is roughly 30,000 annual sorties across multiple Air Force installations.

The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality of training and readiness of pilots of the 1 FW, 192d Wing, and other units supported by JBLE-Langley. Dedicated ADAIR will also allow the formal triaing units (FTUs) to free up resources used to self-generate ADAIR and more effectively use those available flying hours.

- Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

- Point of Contact

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

- Activity List:

Activity Type		Activity Title
2.	Aircraft	Airfield Operations - High Scenario
3.	Personnel	Workday Commute
4.	Degreaser	Minor Parts Cleanining - ADAIR Contractor Aircraft
5.	Tanks	Jet A Storage
6.	Tanks	Jet A Storage
7.	Tanks	Jet A Storage
8.	Tanks	Jet A Storage
9.	Tanks	Jet A Storage
10.	Tanks	Jet A Storage

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Airfield Operations - High Scenario

- Activity Description:
Contractor ADAIR sorties and profciency training in vicinity of the airfield - High Emission Scenario - F-100-PW-100 Engine (Surrogate for MIG-29). ACAM default time in mode used.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	169.469823
SO_x	62.651840
NO_x	653.745315
CO	1379.981647
PM 10	117.990125

Pollutant	Total Emissions (TONs)
PM 2.5	107.700600
Pb	0.000000
NH_3	0.000000
CO_2e	135949.3

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	96.871097
SO_x	48.027457
NO_x	444.839811
CO	1252.593868
PM 10	96.454982

Pollutant	Total Emissions (TONs)
PM 2.5	86.809484
Pb	0.000000
NH_3	0.000000
CO_2e	124950.4

- Activity Emissions [Aerospace Ground Equipment (AGE) part]:

Pollutant	Total Emissions (TONs)
VOC	72.598726
SO_x	14.624383
NO_x	208.905504
CO	127.387779
PM 10	21.535143

Pollutant	Total Emissions (TONs)
PM 2.5	20.891116
Pb	0.000000
NH_3	0.000000
CO_2e	10999.0

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-15A
Engine Model: F100-PW-100
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? Yes
Original Aircraft Name: MiG-29
Original Engine Name: Klimov RD-33

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1127.00	3.79	1.06	4.64	49.58	3.13	2.82	3234
Approach	2765.00	1.06	1.06	12.52	3.99	1.57	1.41	3234
Intermediate	7685.00	0.14	1.06	27.09	0.72	0.72	0.65	3234
Military	10996.00	0.12	1.06	35.01	0.70	1.24	1.12	3234
After Burn	54007.00	0.13	1.06	6.62	9.57	0.87	0.78	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 14
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 4100
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 554
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	18.5
Takeoff [Military] (mins):	0.2
Takeoff [After Burn] (mins):	0.2
Climb Out [Intermediate] (mins):	0.8
Approach [Approach] (mins):	3.5
Taxi/Idle In [Idle] (mins):	11.3

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	12
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	9
AfterBurn (mins):	3

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
APU_{POL} = APU * OH * LTO * EF_{POL} / 2000

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

2.5 Aerospace Ground Equipment (AGE)

2.5.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 4100

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.33	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Bomb Lift	MJ-1B
1	0.33	No	Generator Set	A/M32A-86D
1	0.5	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-2/TTU-228 - 130hp
1	8	No	Light Cart	NF-2
1	0.33	No	Start Cart	A/M32A-60A

2.5.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
MJ-1B	0.0	3.040	0.219	4.780	3.040	0.800	0.776	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-228 - 130hp	7.4	0.195	0.053	3.396	0.794	0.089	0.086	168.8
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

2.5.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year
AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs

EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Workday Commute

- Activity Description:
ADAIR Contractor Personnel Comute from off-base (91 Maintenance Personnel & 18 Pilots).

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.518051
SO_x	0.016413
NO_x	2.367828
CO	28.384143
PM 10	0.059766

Pollutant	Total Emissions (TONs)
PM 2.5	0.053294
Pb	0.000000
NH_3	0.156958
CO_2e	2453.5

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 0
Civilian Personnel: 0
Support Contractor Personnel: 109
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.310	000.002	000.254	003.459	000.008	000.007		000.024	00332.729
LDGT	000.397	000.003	000.445	004.947	000.010	000.009		000.025	00429.544
HDGV	000.776	000.005	001.157	016.207	000.023	000.021		000.045	00772.688
LDDV	000.117	000.003	000.140	002.505	000.004	000.004		000.008	00323.560
LDDT	000.285	000.004	000.430	004.619	000.007	000.007		000.008	00465.004
HDDV	000.535	000.013	005.411	001.874	000.194	000.179		000.028	01509.090
MC	002.446	000.003	000.748	013.123	000.027	000.024		000.053	00397.514

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Degreaser

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Minor Parts Cleanining - ADAIR Contractor Aircraft

- Activity Description:
Small Parts Cleaning (assume 0.5 gal solvent /mo consumed). Major repairs & maintenance conducted off-site.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.195390
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Degreaser Assumptions

- Degreaser
Net solvent usage (total less recycle) (gallons/year): 6

- Default Settings Used: Yes

- Degreaser Consumption
Solvent used: Mineral Spirits CAS#64475-85-0 (default)
Specific gravity of solvent: 0.78 (default)
Solvent VOC content (%): 100 (default)
Efficiency of control device (%): 0 (default)

4.3 Degreaser Formula(s)

- Degreaser Emissions per Year
DE_{VOC}= (VOC / 100) * NS * SG * 8.35 * (1 - (CD / 100)) / 2000

DE_{VOC}: Degreaser VOC Emissions (TONs per Year)
VOC: Solvent VOC content (%)
(VOC / 100): Conversion Factor percent to decimal
NS: Net solvent usage (total less recycle) (gallons/year)
SG: Specific gravity of solvent
8.35: Conversion Factor the density of water
CD: Efficiency of control device (%)
(1 - (CD / 100)): Conversion Factor percent to decimal (Not effected by control device)
2000: Conversion Factor pounds to tons

5. Tanks

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Jet A Storage

- Activity Description:
366K AST. Accounts for additional fuel throughput due to Contractor ADAIR Sorties. Fuel use estimated based on number of sorties and time in mode. Includes fuel used in Warning Areas and in the vicinity of the airfield.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.689295
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

5.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Vertical Tank
Tank Height (ft): 65
Tank Diameter (ft): 31
Annual Net Throughput (gallon/year): 1133657

5.3 Tank Formula(s)

- Vapor Space Volume
VSV = (PI / 4) * D^2 * H / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * H / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
H: Tank Height (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * H)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

6. Tanks

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Jet A Storage

- Activity Description:
560 K AST. Accounts for additional fuel throughput due to Contractor ADAIR Sorties. Fuel use estimated based on number of sorties and time in mode. Includes fuel used in Warning Areas and in the vicinity of the airfield.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.565349
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

6.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Vertical Tank
Tank Height (ft): 74
Tank Diameter (ft): 36
Annual Net Throughput (gallon/year): 1712780

6.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * H / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * H / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
H: Tank Height (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * H)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

7. Tanks

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Jet A Storage

- Activity Description:
601 K AST. Accounts for additional fuel throughput due to Contractor ADAIR Sorties. Fuel use estimated based on number of sorties and time in mode. Includes fuel used in Warning Areas and in the vicinity of the airfield.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.532801
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

7.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Vertical Tank
Tank Height (ft): 75
Tank Diameter (ft): 37
Annual Net Throughput (gallon/year): 1602069

7.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * H / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * H / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
H: Tank Height (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * H)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

8. Tanks

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Jet A Storage

- Activity Description:
615K AST. Accounts for additional fuel throughput due to Contractor ADAIR Sorties. Fuel use estimated based on number of sorties and time in mode. Includes fuel used in Warning Areas and in the vicinity of the airfield.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.592121
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

8.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Vertical Tank
Tank Height (ft): 75
Tank Diameter (ft): 37.5
Annual Net Throughput (gallon/year): 1635311

8.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * H / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * H / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
H: Tank Height (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * H)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

9. Tanks

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Jet A Storage

- Activity Description:
613K AST. Accounts for additional fuel throughput due to Contractor ADAIR Sorties. Fuel use estimated based on number of sorties and time in mode. Includes fuel used in Warning Areas and in the vicinity of the airfield.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.594111
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

9.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 75
Tank Diameter (ft): 37.5
Annual Net Throughput (gallon/year): 1637472

9.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

10. Tanks

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

- Activity Title: Jet A Storage

- Activity Description:
619K AST. Accounts for additional fuel throughput due to Contractor ADAIR Sorties. Fuel use estimated based on number of sorties and time in mode. Includes fuel used in Warning Areas and in the vicinity of the airfield.

- Activity Start Date
Start Month: 7
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 6
End Year: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.600018
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

10.2 Tanks Assumptions

- Chemical
Chemical Name: Jet kerosene (JP-5, JP-8 or Jet-A)
Chemical Category: Petroleum Distillates
Chemical Density: 7
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000170775135930213
Vapor Pressure: 0.00725
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 75
Tank Diameter (ft): 37.5
Annual Net Throughput (gallon/year): 1643886

10.3 Tank Formula(s)

- Vapor Space Volume
$VSV = (PI / 4) * D^2 * L / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

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Appendix C-3

Summary Air Conformity Applicability Model Reports
Record of Air Analysis (ROAA)

(For General Conformity Applicability Determination and National Environmental Policy Act Air Quality Assessment)

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LANGLEY HIGH EMISSION SCENARIO SUMMARY

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:
Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	9.338	100	No
NOx	32.806	100	No
CO	70.418		
SOx	3.133		
PM 10	5.902		
PM 2.5	5.388		
Pb	0.000		
NH3	0.008		
CO2e	6920.1		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	18.676	100	No
NOx	65.611	100	No
CO	140.837		
SOx	6.267		
PM 10	11.805		
PM 2.5	10.775		
Pb	0.000		
NH3	0.016		
CO2e	13840.3		

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	9.338	100	No
NOx	32.806	100	No
CO	70.418		
SOx	3.133		
PM 10	5.902		
PM 2.5	5.388		
Pb	0.000		
NH3	0.008		
CO2e	6920.1		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Tim Sletten

Tim Sletten, Senior Environmental Scientist ___09/15/2019___ DATE

LANGLEY MEDIUM EMISSION SCENARIO SUMMARY

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:
Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	5.010	100	No
NOx	21.516	100	No
CO	32.540		
SOx	2.235		
PM 10	3.463		
PM 2.5	2.285		
Pb	0.000		
NH3	0.008		
CO2e	5203.1		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	10.021	100	No
NOx	43.033	100	No
CO	65.080		
SOx	4.470		
PM 10	6.926		
PM 2.5	4.570		
Pb	0.000		
NH3	0.016		
CO2e	10406.2		

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	5.010	100	No
NOx	21.516	100	No
CO	32.540		
SOx	2.235		
PM 10	3.463		
PM 2.5	2.285		
Pb	0.000		
NH3	0.008		
CO2e	5203.1		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Tim Sletten

Tim Sletten, Senior Environmental Scientist ___09/15/2019___ DATE

LANGLEY LOW EMISSION SCENARIO SUMMARY

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): Norfolk-Virginia Beach-Newport News (Hampton Roads), VA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:
Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	24.981	100	No
NOx	11.996	100	No
CO	123.686		
SOx	1.679		
PM 10	1.085		
PM 2.5	1.052		
Pb	0.000		
NH3	0.008		
CO2e	3405.7		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	49.962	100	No
NOx	23.991	100	No
CO	247.373		
SOx	3.357		
PM 10	2.169		
PM 2.5	2.104		
Pb	0.000		
NH3	0.016		
CO2e	6811.4		

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	24.981	100	No
NOx	11.996	100	No
CO	123.686		
SOx	1.679		
PM 10	1.085		
PM 2.5	1.052		
Pb	0.000		
NH3	0.008		
CO2e	3405.7		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Norfolk-Virginia Beach-Newport News (Hampton Roads), VA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Tim Sletten

Tim Sletten, Senior Environmental Scientist ___09/15/2019___ DATE

W-386 HIGH EMISSION SCENARIO

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impacts associated with the action in accordance with the Air Force Instruction 32-7040; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.319	100	No
NOx	60.817	100	No
CO	1.616	100	No
SOx	2.380	100	No
PM 10	1.616	100	No
PM 2.5	1.455	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	7260.3		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.638	100	No
NOx	121.633	100	Yes
CO	3.233	100	No
SOx	4.759	100	No
PM 10	3.233	100	No
PM 2.5	2.909	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	14520.5		

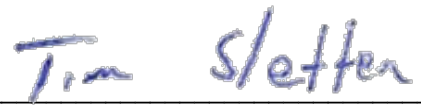
2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.319	100	No
NOx	60.817	100	No
CO	1.616	100	No
SOx	2.380	100	No
PM 10	1.616	100	No
PM 2.5	1.455	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	7260.3		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

Some estimated emissions associated with this action are above the GCR indicators, indicating a significant impact to air quality; therefore, further air assessment is needed.



Tim Sletten, Senior Environmental Scientist ___07/01/2019___
DATE

W-386 MEDIUM EMISSION SCENARIO

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impacts associated with the action in accordance with the Air Force Instruction 32-7040; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.050	100	No
NOx	18.120	100	No
CO	3.716	100	No
SOx	1.135	100	No
PM 10	0.617	100	No
PM 2.5	0.439	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3463.4		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.101	100	No
NOx	36.240	100	No
CO	7.432	100	No
SOx	2.270	100	No
PM 10	1.234	100	No
PM 2.5	0.878	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	6926.8		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.050	100	No
NOx	18.120	100	No
CO	3.716	100	No
SOx	1.135	100	No
PM 10	0.617	100	No
PM 2.5	0.439	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3463.4		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Tim Sletten

_____ ___07/01/2019___

Tim Sletten, Senior Environmental Scientist DATE

W-386 LOW EMISSION SCENARIO

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impacts associated with the action in accordance with the Air Force Instruction 32-7040; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.613	100	No
NOx	1.493	100	No
CO	27.911	100	No
SOx	0.688	100	No
PM 10	0.007	100	No
PM 2.5	0.006	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2099.2		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.225	100	No
NOx	2.986	100	No
CO	55.823	100	No
SOx	1.376	100	No
PM 10	0.014	100	No
PM 2.5	0.013	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	4198.4		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.613	100	No
NOx	1.493	100	No
CO	27.911	100	No
SOx	0.688	100	No
PM 10	0.007	100	No
PM 2.5	0.006	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2099.2		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Tim Sletten

_____ ___07/01/2019___

Tim Sletten, Senior Environmental Scientist DATE

W-122 & W-72 LOW EMISSION SCENARIO

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impacts associated with the action in accordance with the Air Force Instruction 32-7040; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.021	100	No
NOx	4.054	100	No
CO	0.108	100	No
SOx	0.159	100	No
PM 10	0.108	100	No
PM 2.5	0.097	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	484.0		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.043	100	No
NOx	8.109	100	No
CO	0.216	100	No
SOx	0.317	100	No
PM 10	0.216	100	No
PM 2.5	0.194	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	968.0		

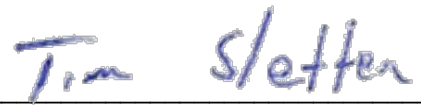
2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.021	100	No
NOx	4.054	100	No
CO	0.108	100	No
SOx	0.159	100	No
PM 10	0.108	100	No
PM 2.5	0.097	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	484.0		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.



Tim Sletten, Senior Environmental Scientist ___07/01/2019___ DATE

W-122 & W-72 MEDIUM EMISSION SCENARIO

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impacts associated with the action in accordance with the Air Force Instruction 32-7040; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.003	100	No
NOx	1.208	100	No
CO	0.248	100	No
SOx	0.076	100	No
PM 10	0.041	100	No
PM 2.5	0.029	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	230.9		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.007	100	No
NOx	2.416	100	No
CO	0.495	100	No
SOx	0.151	100	No
PM 10	0.082	100	No
PM 2.5	0.059	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	461.8		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.003	100	No
NOx	1.208	100	No
CO	0.248	100	No
SOx	0.076	100	No
PM 10	0.041	100	No
PM 2.5	0.029	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	230.9		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Tim Sletten

_____ ___07/01/2019___

Tim Sletten, Senior Environmental Scientist DATE

W-122 & W-72 LOW EMISSION SCENARIO

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impacts associated with the action in accordance with the Air Force Instruction 32-7040; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: LANGLEY AFB
State: Virginia
County(s): York
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: JBLE Combat Air Force Adversary Air

c. Project Number/s (if applicable):

d. Projected Action Start Date: 7 / 2019

e. Action Description:

Alternative 1 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72, operating out of a consolidated facility in Building 751.

Alternative 2 – Establish contract ADAIR capabilities (an estimated 14 aircraft) providing 4,100 annual training sorties at JBLE-Langley in W-386, W-122, and W-72 operating out of two facilities. Contract ADAIR would utilize AMU and hangar space in Building 751 but share operations space with existing T-38 operations in Building 790. Alternative 2 is identical to Alternative 1 in terms of air quality impacts thus ACAM was run for Alternative 1 only.

f. Point of Contact:

Name: Tim Sletten
Title: Senior Environmental Scientist
Organization: Versar
Email: tsletten@versar.com
Phone Number: 301-728-4185

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.174	100	No
NOx	0.100	100	No
CO	1.861	100	No
SOx	0.046	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	139.9		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.348	100	No
NOx	0.199	100	No
CO	3.722	100	No
SOx	0.092	100	No
PM 10	0.001	100	No
PM 2.5	0.001	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	279.9		

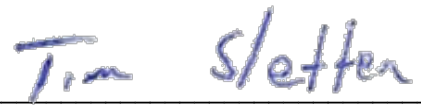
2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.174	100	No
NOx	0.100	100	No
CO	1.861	100	No
SOx	0.046	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	139.9		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.



Tim Sletten, Senior Environmental Scientist ___07/01/2019___
DATE

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APPENDIX D

LISTED SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

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THREATENED AND ENDANGERED SPECIES/CRITICAL HABITAT

A list of species that could potentially be found in the action area was obtained from the United States Fish and Wildlife Service Information for Planning and Consultation website, National Marine Fisheries Listed Species Lists and Section 7 Mapper, and Virginia Department of Game and Inland Fisheries (**Table D-1**).

Table D-1
Federal and State Listed Species with the Potential to Occur in or near Joint Base Langley-Eustis, Langley Air Force Base and the Warning Areas

Species	Federal Status[1]	Virginia State Status[2]	JBLE-Langley	Warning Areas
Birds				
Eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*)	Proposed Threatened	Endangered	X	
Red-cockaded woodpecker (*Picoides* [= *Dendrocopos*] *borealis*)	Endangered	Endangered	X	
Bermuda petrel (*Pterodroma cahow*)	Endangered	-		X
Piping plover *(Charadrius melodus)*	Threatened	Threatened	X	
Red knot (*Calidris canutus rufa*)	Threatened	Threatened		X
Roseate tern (*Sterna dougallii*)	Threatened	-		X
Loggerhead shrike (*Lanius ludovicianus*)	Sensitive	Threatened	X	
Peregrine falcon (*Falco peregrinus*)	-	Threatened	X	
Upland sandpiper (*Bartramia longicauda)*	-	Threatened	X	
Gull-billed tern (*Sterna nilotica*i)	-	Threatened	X	
Mammals				
Blue whale (*Balaenoptera musculus*)	Endangered	Endangered		X
Fin whale (*Balaenoptera physalus*)	Endangered	Endangered		X
North Atlantic right whale (*Eubalaena glacialis*)	Endangered	Endangered		X
Sei whale (*Balaenoptera boreali*)	Endangered	Endangered		X
Sperm whale (*Physeter microcephalus*)	Endangered	Endangered		X
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	-	X	
Reptiles				
Kemp's (= Atlantic) Ridley turtle (*Lepidochelys kempii*)	Endangered	Endangered	X	X
Hawksbill turtle (*Eretmochelys imbricata*)	Endangered	Endangered		X
Leatherback turtle (*Dermochelys coriacea*)	Endangered	Endangered	X	X

Table D-1
Federal and State Listed Species with the Potential to Occur in or near Joint Base Langley-Eustis, Langley Air Force Base and the Warning Areas

Species	Federal Status[1]	Virginia State Status[2]	JBLE-Langley	Warning Areas
Loggerhead turtle (*Caretta caretta*)	Threatened	Threatened	X	X
Green turtle (*Chelonia mydas*)	Threatened	Threatened	X	X
Canebrake rattlesnake (*Crotalus horridus*)	-	Endangered	X	
Amphibians				
Eastern tiger salamander (*Ambystoma tigrinum*)	-	Endangered	X	
Mabee's salamander (*Ambystoma mabeei*)	-	Threatened	X	
Barking treefrog (*Hyla gratiosa*)	-	Threatened	X	
Fish				
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	Endangered	Endangered	X	X
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	Endangered	X	
Plants				
Harper's fimbristylis (*Fimbristylis perpusilla*)	-	Endangered	X	
Insects				
Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*)	Threatened	Threatened	X	

Sources:
[1] United States Fish and Wildlife Service. 2018. *Environmental Conservation Online System*. <https://ecos.fws.gov/ecp/> Accessed May 2018.
[2] Virginia Department of Game and Inland Fisheries. 2018. *Threatened, Endangered, and Special Concern Species*. <https://www.dgif.virginia.gov/wildlife/> Accessed May 2018.

JBLE-Langley = Joint Base Langley-Eustis, Langley Air Force Base

APPENDIX E

MITIGATION PLAN

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E.1 INTRODUCTION

Agencies are required to identify and include all relevant and reasonable mitigation measures that could reduce potential significant impacts. The National Environmental Policy Act (NEPA) Council on Environmental Quality (CEQ) regulations (40 CFR § 1508.20) define mitigation as

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing the impact by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- compensating for the impact by replacing or providing substitute resources or environments.

The President's CEQ Memorandum, *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact* (2011), provides guidance for establishing, implementing, and monitoring mitigation commitments identified and analyzed in Environmental Assessments (EAs) and Environmental Impact Statements and adopted in final decision documents. Notably, the guidance states that a "mitigated Finding of No Significant Impact (FONSI)" can be issued to comply with NEPA based on the agency's commitment to ensure mitigation is performed that supports the FONSI.

The development of mitigation measures in support of Combat Air Forces Adversary Air (ADAIR) at Joint Base Langley-Eustis, Langley Air Force Base (JBLE-Langley) is necessary because the analysis in the EA determined that implementation of the Proposed Action could result in potentially significant impacts on the noise environment around JBLE-Langley. This Appendix provides an overview of mitigation measures considered to reduce potentially significant noise impacts associated with implementation of the Proposed Action.

In accordance with 32 CFR § 989.22, mitigation measures were developed to reduce potential impacts associated with noise. In the case of other resources, mitigation measures were not required and best management practices (BMPs) are described, when applicable, in the environmental consequences' discussion for each resource (refer to **Chapter 4**). JBLE-Langley follows applicable Air Force regulations and BMPs as well as federal, state, and local regulations and directives.

E.2 METHODOLOGY AND FINDINGS FOR ANALYSIS OF POTENTIAL IMPACTS

Because the type of aircraft that would be used by contract ADAIR is unknown at this time, three aircraft scenarios were evaluated (High, Medium, and Low) to represent the range of aircraft types and noise levels that could be selected. These scenarios are discussed in **Section 4.2** of the EA. Depending on the specific type of contract ADAIR aircraft, impacts on the noise environment are expected to range from minor to negligible for the Medium and Low Noise Scenarios and would be long-term; however, potentially significant impacts on the noise environment may occur under implementation of the High Noise Scenario. As described in **Section 4.2.3.1**, at the representative noise-sensitive locations modeled, the day-night average sound level (DNL) would increase at select points of interest (POIs) by an amount ranging from 0 to 4 A-weighted-decibels (dBA) under the High Noise Scenario. DNL increases of 3 or more dBA would be perceptible and may increase human annoyance. If unmitigated, impacts within this range would be major and could potentially be significant. Because the specific mix of aircraft to be used by contract ADAIR is unknown, the range of potential impacts was bounded by the scenarios chosen for analysis (High, Medium, and Low). The ultimate need for mitigation will be determined by the actual aircraft used for contract ADAIR. The methodology described below for mitigation strategies is prepared using the noise modeling results for the High Noise Scenario.

E.3 METHODOLOGY FOR MITIGATION STRATEGIES

By modeling different distributions of aircraft operations, the mitigation analysis indicated to what degree, if any, the increased DNL around the airfield might be reduced. As described in **Appendix B**,

representative profiles for aircraft operations provide the speed and power setting of each type of aircraft as a function of distance along the ground flight track for the representative maneuvers. For modeling purposes, the appropriate profile is for all flight tracks that conform to that maneuver type. For example, all overhead break arrival tracks would utilize the representative profile for modeling that maneuver. Different operations may utilize the same flight track but have a different profile. The flight tracks used for the proposed contract ADAIR aircraft are the same as those used by the appropriate aircraft of the local squadron.

To determine the noise impact around the airfield, noise-sensitive receptors were identified through air installation compatible use zone (AICUZ) planning efforts. These are locations around the airfield that have been input into the noise model as specific POIs in order to calculate the DNL at the location. Schools, places of worship, and residences are commonly identified as noise-sensitive receptors (**Table E-1**; **Figure E-1**). The DNL at these locations was used to determine the efficacy of the proposed mitigation.

As described in the Proposed Action (**Chapter 2**), the maximum number of annual ADAIR sorties proposed is 4,100. The noise mitigation analysis did not modify the proposed annual sorties but instead considers modification to the distribution of the operations that result from the proposed sorties.

E.4 PROPOSED MITIGATION

The mitigation scenarios outlined in **Table E-2** were considered and evaluated. Of the mitigation scenarios evaluated by the Air Force, seven were considered not operationally viable. Mitigation scenarios carried forward for detailed analysis are described in this **Section E.5** of this appendix.

E.5 ANALYSIS OF MITIGATION SCENARIOS

Noise analyses conducted for the Proposed Action (refer to **Section 4.2.2.1**) indicate that the noise exposure at JBLE-Langley may increase significantly with the proposed addition of ADAIR contractor flight training operations. This noise increase is due to the proposed High Noise Scenario for contractor aircraft and specifically for the straight-in arrival operations by these high noise aircraft.

Operational noise mitigation scenarios were evaluated for the potential to achieve noise reduction at the POIs in the vicinity of the airfield with the goal of eliminating all significant noise increases caused by the addition of ADAIR contractor aircraft operations. This section describes the noise mitigation scenarios evaluated for JBLE-Langley, including the scenarios that were successful in achieving the desired noise reduction.

After a review of potential mitigation measures for JBLE-Langley (**Table E-2**), the Air Force selected four that were considered viable based on safety requirements, training goals, and practicality of implementation. These noise mitigation measures are described in **Table E-3** including general and detailed descriptions of the operational change associated with each scenario. Because the noise increase associated with contract ADAIR High Noise aircraft is primarily due to the straight-in arrival operations, the noise mitigation options in **Table E-3** focus mainly on reducing these straight-in arrivals and increasing overhead break arrivals to redistribute noise around the airfield to achieve successful noise mitigation. Noise Mitigation Options 2, 3, and 4 include changes to arrival flight paths only. Option 1 includes changes to arrival flight paths during environmental night (10:00 p.m. to 7:00 a.m.). Noise Mitigation Options 1, 2, 3,

AN OVERHEAD BREAK ARRIVAL, ALSO CALLED A PITCH ARRIVAL, IS WHEN THE AIRCRAFT APPROACHES THE RUNWAY, ALONG THE EXTENDED RUNWAY CENTERLINE, AT A SET ALTITUDE. THE AIRCRAFT FLIES OVER THE LENGTH OF THE RUNWAY AT THE SET HEIGHT, THEN BANKS SHARPLY (180 DEGREES) DECREASING BOTH ALTITUDE AND AIRSPEED, FLIES PARALLEL TO THE RUNWAY IN THE OPPOSITE DIRECTION, THEN BANKS SHARPLY ONCE AGAIN (180 DEGREES) TO SHED THE REMAINDER OF ITS ALTITUDE AND SPEED. THE AIRCRAFT IS NOW AT THE RUNWAY THRESHOLD, NEAR GROUND LEVEL, AND PREFORMS ITS LANDING.

A STRAIGHT-IN ARRIVAL IS DESCRIBED AS THE AIRCRAFT'S FINAL APPROACH TO THE RUNWAY WHICH IS ACCOMPLISHED AT A NEAR CONSTANT SLOPE AND CONSTANT SPEED ALONG THE EXTENDED RUNWAY CENTERLINE.

and 4 can be exercised individually or in combination if additional noise reduction is required. Options 2 and 3 cannot occur concurrently nor can Options 3 and 4 occur concurrently. From the combination of these four mitigation options, five different mitigation scenarios, shown in **Table E-4**, were tested that involve either individual scenerios or a combination of scenerios. Operational leadership will implement these mitigation measures in a manner consistent with safety of flight and mission necessity.

Table E-1
Proposed High Noise Scenario Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

POIs		DNL (dBA)		
ID	Description	Existing	High Noise Scenario	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	71	2
H02	Langley Air Force Base Hospital	75	76	1
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	65	2
R01	Residential #1, Fox Hill	62	64	2
R02	Residential #2, Poquoson	67	70	3
R03	Residential #3, Michael's Woods	63	71	8
R04	Residential #4, Mobile Home Park West Gate	77	79	2
R05	Residential #5, Mobile Home Park Langley Speedway	74	75	1
R06	Residential #6, Langley Air Force Base Officer's Housing	76	78	2
R07	Residential #7, Enlisted Base Housing	77	79	2
S01	Hampton Christian Academy	60	62	2
S02	Machen Elementary School	70	72	2
S03	New Horizons Regional Education Center	67	73	6
S04	Paul Burbank Elementary School	60	62	2
S05	Peninsula Catholic School	53	57	4
S06	Thomas Nelson Community College	67	75	8
S07	Watkins Early Childhood Center	52	57	5
S08	William Mason Cooper Elementary School	59	61	2
W01	Emmanuel Lutheran Church	66	69	3
W02	Faith Baptist Church	65	69	4
W03	Langley Air Force Base Chapel	74	75	1
W04	Sharon Baptist Church	65	67	2

Notes:

Affected POIs based off NOISEMAP modeled noise contours and used to calculate the POIs within each noise contour.

dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

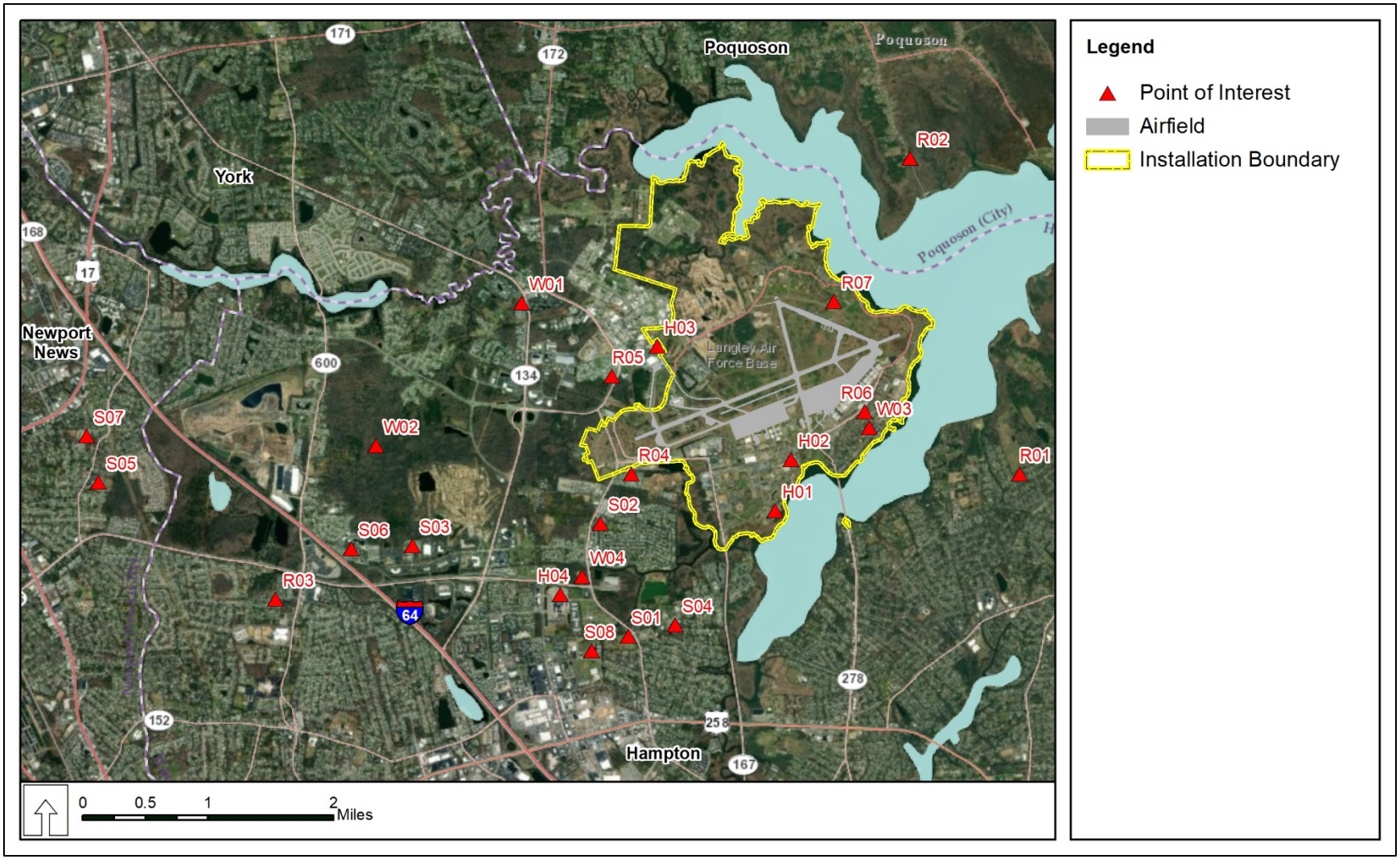


Figure E-1. Representative Points of Interest on and Near Joint Base Langley-Eustis, Langley Air Force Base.

Table E-2
Overview of Preliminary Mitigation Screening

Mitigation Considered	Viable for Flight Safety/ Operations? (Yes/No)	Viable for Adversary Air Training Goals? (Yes/No)	Consider as Mitigation Scenario? (Yes/No)
Substitute Medium Noise or Low Noise Aircraft for the F-18E/F (complete substitution or mix)	Yes	No	No - does not meet project schedule or budgetary requirements
Reduce day and/or night sorties	Yes	No	Yes - overall sorties must remain constant; arrival before environmental night carried forward for evaluation
Deploy gear and flaps later on arrival to reduce landing noise	No	Yes	No - eliminated for safety reasons
Measure Eurofighter Typhoon and Develop Noisemap Database	Yes	No	No - additional modeling and research would not meet the project schedule requirements
Increase F-18E/F straight-in arrivals on Runway 26/decrease straight-in arrivals on Runway 08	Yes	Yes	Yes - carried forward for evaluation
Reduce F-18E/F straight-in arrivals on Runway 08 and increase overhead break arrivals on Runway 08	Yes	Yes	Yes - carried forward for evaluation
Cut back power on F-18E/F arrival at higher altitude and intercept 4- to 6-degree glideslope instead of 3-degree glideslope	Yes	Yes	No - requires additional coordination with air traffic control; may not be possible due to airspace configuration.
Increase arrival speed to reduce landing noise	Yes	Yes	No - requires additional research and analysis
Sound insulate sensitive receptors located in areas where significant noise impact is predicted to occur	Yes	Yes	No - does not meet project schedule or budgetary requirements
Compensatory mitigation	Yes	Yes	No - does not meet project schedule or budgetary requirements

Table E-3
Preliminary Noise Mitigation Options Tested at Points of Interest at Joint Base Langley-Eustis, Langley Air Force Base

Option	Description	Detailed Change
1	Reduce percent of straight-in arrivals that occur during environmental night (10:00 p.m.-7:00 a.m.)	Currently, 3% of straight-in arrivals occur during 2200-0700. Change this to 2% during environmental night (10:00 p.m.-7:00 a.m.) and 98% during acoustic day (10:00 p.m.-7:00 a.m.).
2	Increase straight-in arrivals on Runway 08, reduce straight-in arrivals on Runway 26	Currently, straight-in arrivals are 60% on Runway 08 and 40% on Runway 26. Change this to zero on Runway 08 and 100% on Runway 26.
3	Launch on Runway 08 and land on Runway 26 exclusively (no flights to the north)	Change ADAIR departures to 100% on Runway 08 and change arrivals to 100% on Runway 26 (to all arrival types).
4	Reduce straight-in arrivals on Runways 08 and 26 and increase overhead break arrivals on Runways 08 and 26	Current arrival type utilization: 25% straight-in, 19% overhead break, 56% tacticals. Change utilization to 0% straight-in, 44% overhead break, and 56% tecticals.

Table E-4
Noise Mitigation Scenarios Tested as a Result of Combining the Four Preliminary Noise Mitigation Scenarios

Scenario	Combination of Mitigation Options	Description of Scenario
1	Option 1 Only	Reduce environmental night straight-in arrivals
2	Option 2 Only	Reduce straight-in arrivals on Runway 08 by increasing straight-in arrivals on Runway 26
3	Option 3 Only	Launch on Runway 08 and recover on Runway 26
4	Option 4 Only	Reduce straight-in arrivals on Runways 08 and 26 by increasing overhead breaks and tacticals on Runways 08 and 26
5	Options 1 and 2	Reduce acoustic night straight-in arrivals; reduce straight-in arrivals on Runway 08 by increasing straight-in arrivals on Runway 26

Notes: Options 2 and 3 and Options 3 and 4 cannot be performed concurrently.

As noted, reducing straight in arrivals and/or straight in arrivals that occur during environmental night comprise all of the scenarios tested. All scenarios were tested by making the noted change to the Proposed Action noise model and evaluating the resulting DNL at each POI. Of the five scenarios tested, two scenarios (2 and 5) were successful in achieving noise reduction around the airfield such that noise increases were limited to 3 dBA DNL or less at all representative POIs except at one POI. The S07 POI (Watkins Early Childhood Center) experiences a 4-dBA DNL increase under the Proposed Action and all mitigation scenarios; however, this POI is outside of the 60-dBA DNL contour under all scenarios.

Mitigation Scenario 2

The modeled action for Noise Mitigation Scenario 2 was to eliminate contract ADAIR straight-in arrivals on Runway 08 by increasing contract ADAR straight-in arrivals on Runway 26. **Table E-5** and **Figure E-2** show the Noise Mitigation Scenario 2 DNL results and the increase above the baseline DNL. Under Noise

Mitigation Scenario 2, the DNL increase at each POI would be limited to 3 dBA or less (excluding POI S07, which as a postmitigation DNL of 56 dBA, well below the threshold for incompatibility with a school or childcare facility).

Table E-5
Noise Mitigation Scenario 2 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

POI		DNL (dBA)		
ID	Description	Existing	Mitigation Scenario 2	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	71	2
H02	Langley Air Force Base Hospital	75	76	1
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	65	2
R01	Residential #1 - Fox Hill	62	64	2
R02	Residential #2 - Poquoson	67	69	2
R03	Residential #3 - Michael's Woods	63	64	1
R04	Residential #4 - Mobile Home Park West Gate	77	78	1
R05	Residential #5 - Mobile Home Park Langley Speedway	74	75	1
R06	Residential #6 - Langley Air Force Base Officer's Housing	76	78	2
R07	Residential #7 - Enlisted Base Housing	77	79	2
S01	Hampton Christian Academy	60	61	1
S02	Machen Elementary School	70	71	1
S03	New Horizons Regional Education Center	67	69	2
S04	Paul Burbank Elementary School	60	62	2
S05	Peninsula Catholic School	53	56	3
S06	Thomas Nelson Community College	67	68	1
S07	Watkins Early Childhood Center	52	56	4
S08	William Mason Cooper Elementary School	59	61	2
W01	Emmanuel Lutheran Church	66	69	3
W02	Faith Baptist Church	61	64	3
W03	Langley Air Force Base Chapel	74	75	1
W04	Sharon Baptist Church	65	66	1

Notes:
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

Mitigation Scenario 5

The modeled action for Noise Mitigation Scenario 5 was to reduce contract ADAIR environmental night operations from 3 to 2 percent and to reduce contract ADAIR straight-in arrivals to Runway 08 by 75 percent by increasing straight-in arrivals on Runway 26. **Table E-6** and **Figure E-3** show the Noise Mitigation Scenario 5 DNL results and the increase above the baseline DNL. Under Noise Mitigation Scenario 5, the DNL increase at each POI would be limited to 3 dBA or less (excluding POI S07, which as a postmitigation DNL of 56 dBA, well below the threshold for incompatibility with a school or childcare facility).

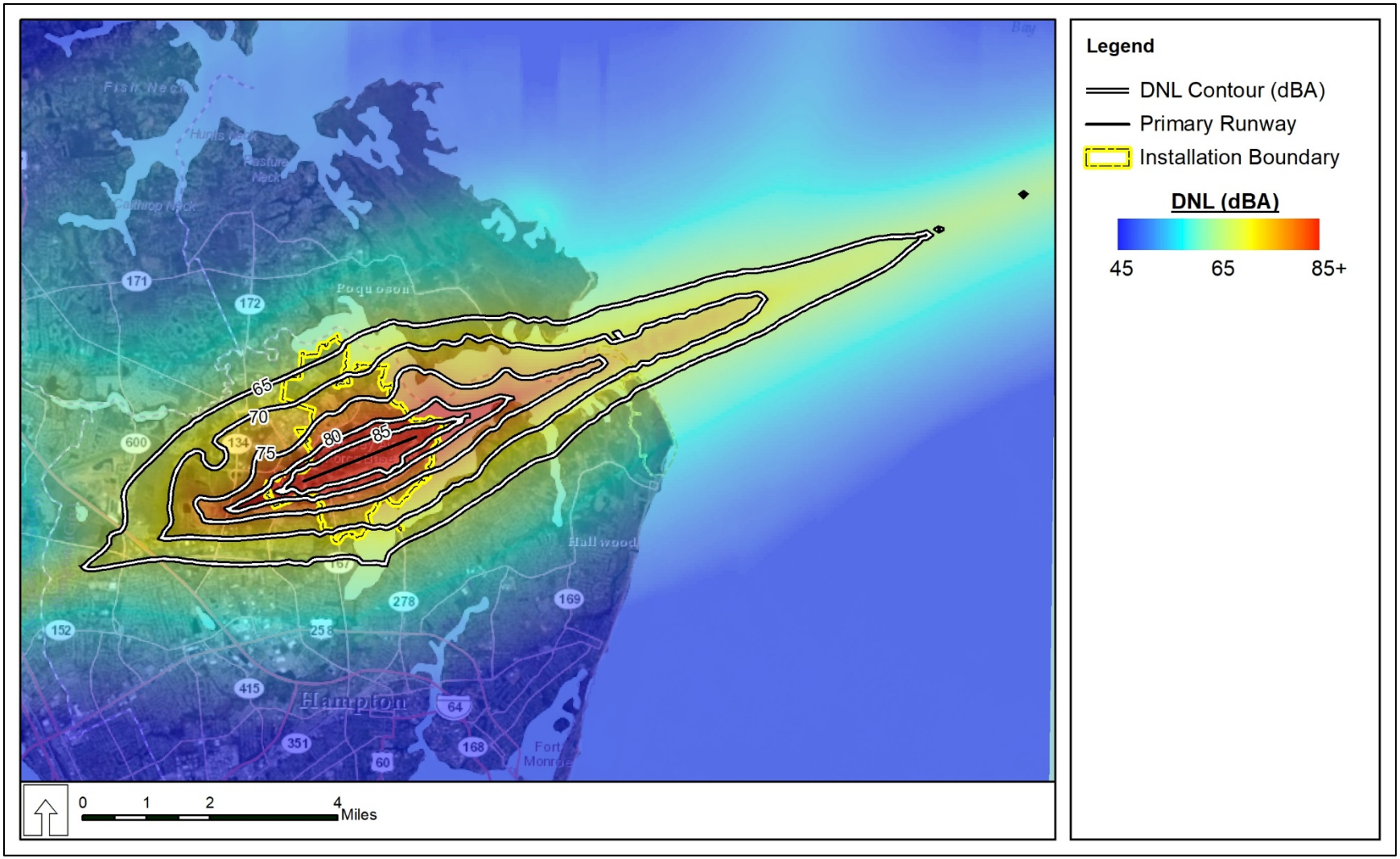


Figure E-2. Noise Mitigation Scenario 2 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base.

Table E-6
Noise Mitigation Scenario 5 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

POI		DNL (dBA)		
ID	Description	Existing	Mitigation Scenario 5	Increase in DNL
H01	Langley Air Force Base Child Development Center	69	70	1
H02	Langley Air Force Base Hospital	75	76	1
H03	National Aeronautics and Space Administration Langley Research Center Child Development Center	74	75	1
H04	Sentara Hospital	63	65	2
R01	Residential #1 - Fox Hill	62	64	2
R02	Residential #2 - Poquoson	67	69	2
R03	Residential #3 - Michael's Woods	63	66	3
R04	Residential #4 - Mobile Home Park West Gate	77	78	1
R05	Residential #5 - Mobile Home Park Langley Speedway	74	75	1
R06	Residential #6 - Langley Air Force Base Officer's Housing	76	78	2
R07	Residential #7 - Enlisted Base Housing	77	78	1
S01	Hampton Christian Academy	60	61	1
S02	Machen Elementary School	70	71	1
S03	New Horizons Regional Education Center	67	70	3
S04	Paul Burbank Elementary School	60	62	2
S05	Peninsula Catholic School	53	56	3
S06	Thomas Nelson Community College	67	70	3
S07	Watkins Early Childhood Center	52	56	4
S08	William Mason Cooper Elementary School	59	60	1
W01	Emmanuel Lutheran Church	66	69	3
W02	Faith Baptist Church	61	64	3
W03	Langley Air Force Base Chapel	74	75	1
W04	Sharon Baptist Church	65	66	1

Notes:
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = point of interest

Selected Approach to Noise Mitigation

Based on the evaluation of the Mitigation Scenarios that achieve the goal of having an increase in DNL of 3 dBA or less at all POIs, Mitigation Scenario 2 or 5 is the most reasonable to implement and would cause the fewest operational concerns in conjunction with implementation of the Proposed Action; therefore, if contract ADAIR implemented aircraft in the High Noise Scenario at JBLE-Langley, JBLE-Langley will implement Mitigation Scenario 2 or 5 to mitigate the potentially significant noise impacts. If only contract ADAIR aircraft in the Medium and Low Noise Scenarios were used at JBLE-Langley for training sorties, no mitigation would be required and no operational changes would occur. Based on the evaluation of the mitigation scenarios that achieve the goal of having an increase in DNL of 3 dBA or less at all POIs (except for POI S07), the implementation of either Mitigation Scenario 2 or Scenario 5 would be successful.

Watkins Early Childhood Center (S07 POI) would experience a 4 dBA DNL increase under the Proposed Action and all mitigation scenarios; however, this POI would have a less than 60-dBA DNL under the Low, Medium, and High Noise Scenarios. As described in **Section 3.2.2**, in accordance with AFH 32-7084, *AICUZ Program Manager's Guide*, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations. This includes schools and childcare facilities; therefore, Watkins Elementary School would not be adversely affected by the mitigated Proposed Action.

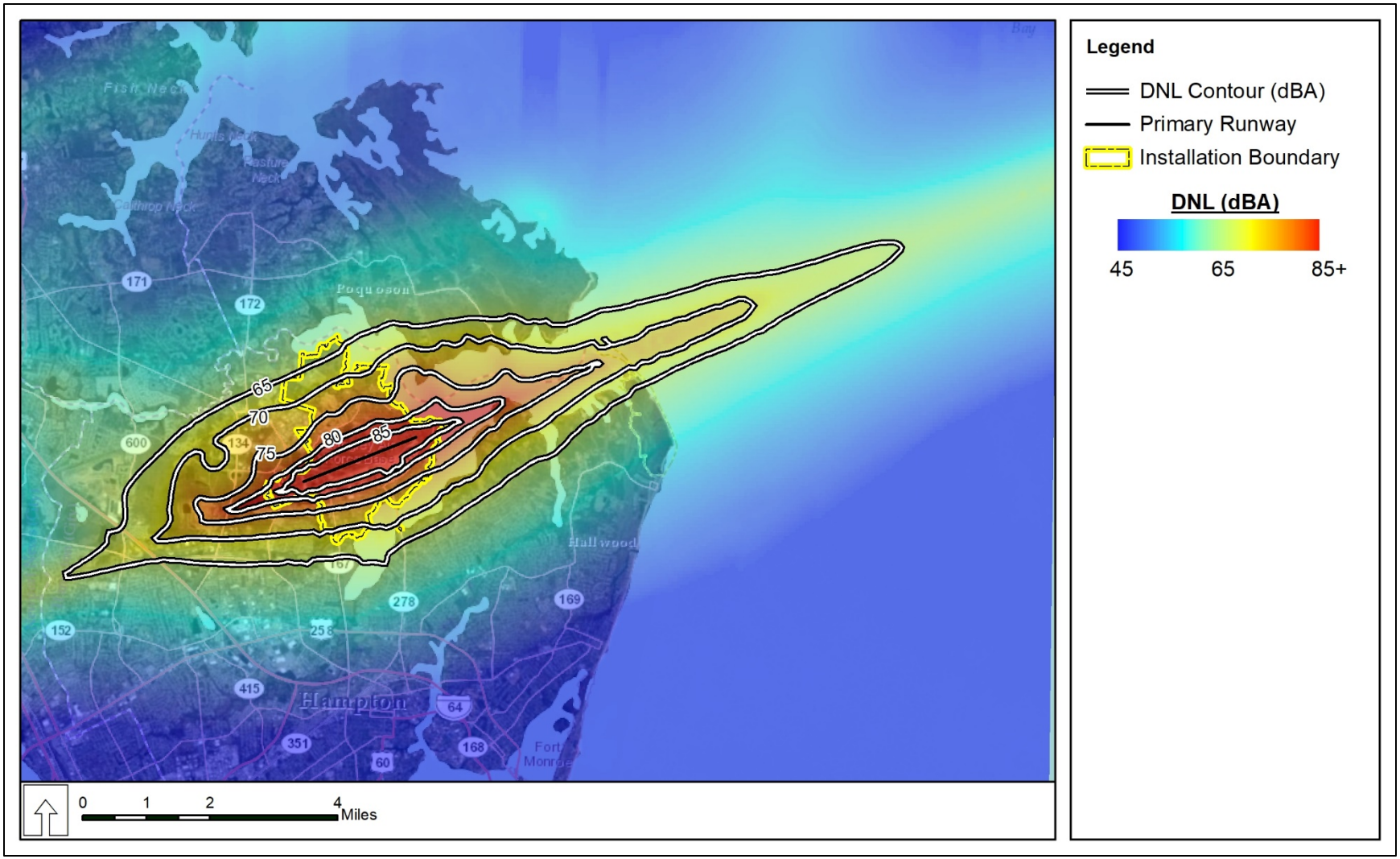


Figure E-3. Noise Mitigation Scenario 5 Day-Night Average Sound Level at Representative Points of Interest on and near Joint Base Langley-Eustis, Langley Air Force Base

As noted previously, the type of aircraft that would be used by contract ADAIR is unknown at this time. The mitigation described in this appendix would only apply if aircraft similar to the High Noise Scenario comprise the contract ADAIR aircraft. If contract ADAIR aircraft are similar to the Medium or Low Noise Scenario, no mitigation would be required. The ultimate need for mitigation would be determined by the actual aircraft used for contract ADAIR.

E.6 IMPLEMENTATION AND MONITORING

The methods for executing and monitoring mitigation measures, the organizations responsible for implementing measures, and the estimated completion date for each measure if the aircraft similar to the High Noise Scenario are brought to JBLE-Langley by the ADAIR contractor are described in **Table E-7**.

Table E-7
Mitigation Implementation and Monitoring

Mitigation Measure[1]	Mitigations Actions to Avoid or Reduce the Potential for Environmental Impacts	Expected Outcome	Entity Responsible for Implementation	Execution Method(s)	Implementation Date[2]
Scenario 2	Reduce straight-in arrivals on Runway 08 by increasing straight-in arrivals on Runway 26	The DNL increase at each POI within the 65-dBA contour is limited to 3 dBA or less.	1 OG Commander	Pilot step brief; ATC advisories; FCIF; and updates to local regulatory guidance (e.g., AFI 11-2F-22V3, Chapter 8)	Ongoing
Scenario 5	Reduce environmental night straight-in arrivals; reduce straight-in arrivals on Runway 08 by increasing straight-in arrivals on Runway 26	The DNL increase at each POI within the 65-dBA contour is limited to 3 dBA or less.	1 OG Commander	Pilot step brief; ATC advisories; FCIF; and updates to local regulatory guidance (e.g., AFI 11-2F-22V3, Chapter 8)	Ongoing

Notes:
[1] Operational leadership will implement these mitigation measures in a manner consistent with safety of flight and mission necessity.
[2] The mitigation would only apply if aircraft similar to the High Noise Scenario comprise the contract ADAIR aircraft.

1 OG = 1st Operations Group; AFI = Air Force Instruction; ATC = Air Traffic Control; dBA = A-weighted decibel(s); DNL = day-night average sound level; FCIF = flight crew information file; POI = point of interest

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APPENDIX F

COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633D AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

AUG 3 0 2019

Ms. Brenda W. Cook
633 CES/CD
37 Sweeney Boulevard
JBLE-Langley VA 23665-2107

Ms. Bettina Rayfield
Commonwealth Of Virginia
Department Of Environmental Quality
P.O. Box 1105
Richmond VA 23218

Dear Ms. Rayfield

As part of your review of the Environmental Assessment for Combat Air Forces Contract Adversary Air Support at Joint Base Langley-Eustis, Langley Air Force Base (DEQ 19-097F), you recommended that we prepare a federal consistency determination pursuant to the Coastal Zone Management Act (CZMA) of 1972. The determination is attached.

If you have any questions, please contact Mr. David Jennings at 757-225-4223 or email david.jennings.4@us.af.mil.

Sincerely

BRENDA W. COOK, DAFC
Deputy Base Civil Engineer

Attachment:
Coastal Zone Management Act (CZMA) Federal Consistency Determination

Global Power For America

Coastal Zone Management Act (CZMA) Federal Consistency Determination for Combat Adversary Air at Joint Base Langley-Eustis-Langley Air Force Base (JBLE-Langley), Virginia

This document provides the Commonwealth of Virginia with Joint Base Langley-Eustis Langley Air Force Base (JBLE-Langley) Consistency Determination under Coastal Zone Management Act (CZMA) section 307(c)(1) [or (2)] and 15 Code of Federal Regulations (CFR) Part 930, subpart C, for the JBLE-Langley. The information in this Consistency Determination is provided pursuant to 15 CFR § 930.39. The federally approved Virginia Coastal Zone Management Program is a network of Virginia state agencies and local governments that administers enforceable laws, regulations, and policies that protect our coastal resources and fosters sustainable development. The Commonwealth of Virginia can require that federal actions are consistent with the state's Coastal Zone Management Program's laws and enforceable policies. The Virginia Department of Environmental Quality (DEQ) is the lead agency for Virginia's networked Coastal Zone Management Program.

Proposed Federal Agency Activity

A Draft Environmental Assessment (EA) and proposed Finding of No Significant Impact (FONSI) have been prepared by the United States Air Force to analyze the impacts of providing dedicated contract adversary air (ADAIR) sorties for Combat Air Forces (CAF) training at JBLE-Langley, Virginia. An electronic copy of the Draft EA and proposed FONSI can be found on the JBLE-Langley Website at https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/.

The Proposed Action would provide dedicated contract ADAIR sorties for CAF training at JBLE-Langley to address shortfalls in F-22 pilot training and production capability and to provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced training missions. Training scenarios would include the use of combat tactics and procedures that differ from CAF tactics to simulate an opposing force. The elements affecting JBLE-Langley include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the airspace include airspace use and defensive countermeasures.

The Proposed Action at JBLE-Langley would include the establishment of an estimated 91 contracted maintainers and 18 contracted pilots who would operate an estimated 14 aircraft. Six aircraft types (MiG 29, F-5, Dassault Mirage, F-16, Eurofighter Typhoon, and JAS-39 Gripen) have been identified as capable of providing contract ADAIR support to F-22 CAF aircrews stationed at JBLE-Langley. One or a combination of these aircraft types may be operated by a contractor at JBLE-Langley in support of ADAIR training for contract ADAIR selection based on performance capabilities of the aircraft and how those capabilities best meet mission training requirements at the installation. The facilities proposed for use at JBLE-Langley are available and include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant storage; runway access; and associated parking to support the Proposed Action. Approximately 4,000 sorties annually would support training activities within nearby special use airspace including Warning Areas W-386, W-72, and W-122 (**Figure 1**). Contract ADAIR aircraft would employ defensive countermeasures (e.g., chaff and flares) in all Warning Areas.

Two alternatives for the proposed contract ADAIR were identified for evaluation in the EA. These alternatives are described below and represent various options for facility use at JBLE-Langley.

Alternative 1. Contract ADAIR capabilities would be established using an estimated 14 aircraft providing 4,100 annual sorties at JBLE-Langley. Of the 4,100 annual sorties, 4,000 training sorties

would occur in Warning Areas W-386, W-72, and W-122. The remaining sorties are expected for aircraft leaving for or returning from either maintenance or other deployments. Operations and maintenance activities and aircrew briefings would be consolidated in Building 751 (**Figure 2**). No construction or other ground-disturbing activities would occur under this alternative.

Alternative 2. Alternative 2 would be the same as described in Alternative 1 except operations would be combined with the T-38 ADAIR mission in Building 790, while maintenance and hangar space would be collocated in Building 751 (**Figure 2**). No construction or other ground-disturbing activities would occur under this alternative.

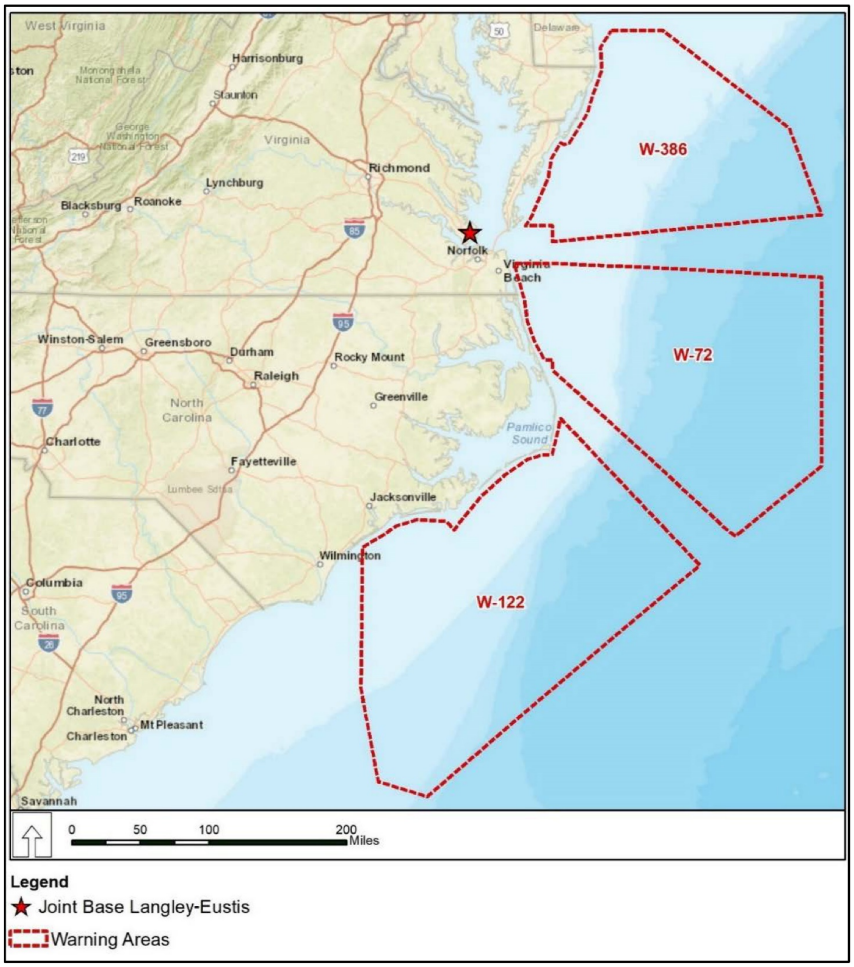


Figure 1. Warning Areas Proposed for Contract Adversary Air Sorties.

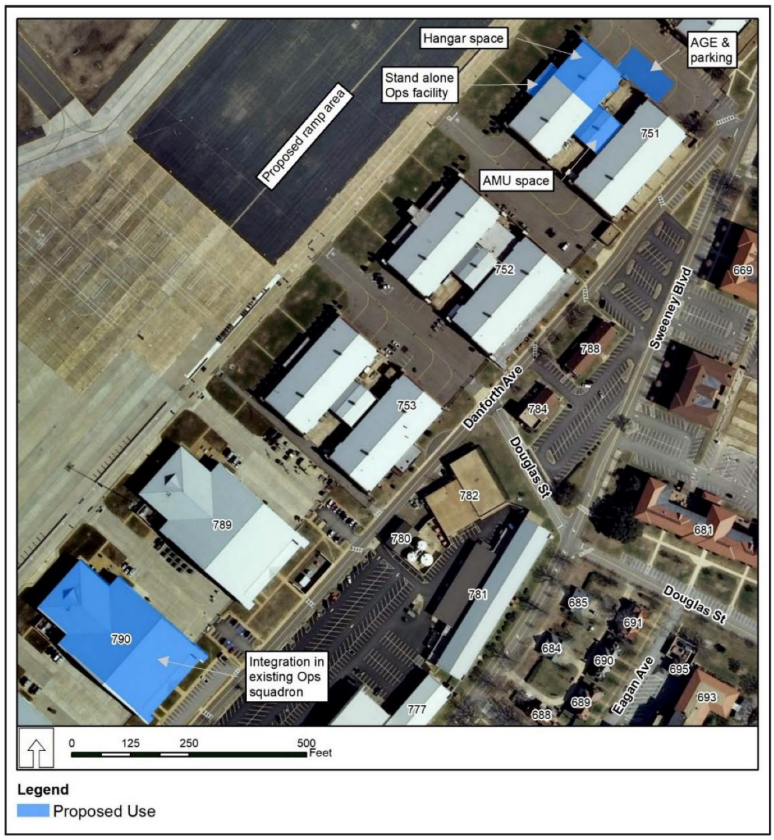


Figure 2. Proposed Location for Combined Aircraft Maintenance Unit, Operations, and Hangar Space at Existing Buildings 751 and 790.

The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality of training and readiness of pilots of the 1st Fighter Wing, 192d Wing, and other units supported by JBLE-Langley. Contract ADAIR support would employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced, simulated, combat training missions. By providing a dedicated contract ADAIR capability, F-22 pilots would gain more realistic air-to-air training during their training syllabus tasks. Dedicated contract ADAIR would also allow the unit to free up resources used to self-generate ADAIR and more effectively use those available flying hours. Additionally, other Air Force (4th generation) units tasked to provide ADAIR training support at JBLE-Langley could recapitalize valuable flying hours to focus on increasing their own levels of proficiency and readiness.

The need for action is to provide better and more realistic training for the F-22 flight training program at JBLE-Langley. Dedicated contract ADAIR is critical to improving pilot readiness as it provides realistic training opportunities to employ CAF tactics and procedures that optimize the training value of every

mission. Contract ADAIR can be used in basic building block syllabus sorties or the very advanced and fluid environment of multiaircraft air combat required by the training syllabus.

Environmental Consequences of the Proposed Action

Potential effects to the land or water uses or natural resources of Virginia from the Proposed Action are provided in the EA in the following:

- **Section 1.4.1.3 Soil Resources.** Protection of soils was considered when evaluating potential impacts of the Proposed Action in terms of alteration of soil composition, structure, or function and any accumulation of chaff material. Effects on soils would be adverse if they alter the soil composition, structure, or function within the environment or accumulate in the soil. Under the Proposed Action, there would be no ground-disturbing activities to affect soil resources and contract ADAIR training would occur over the Atlantic Ocean at least 3 nautical miles from shore; therefore, soil resources are not carried forward for detailed analysis.
- **Section 1.4.1.5 Water Resources.** Under the Proposed Action, there would be no ground-disturbing activities. The proposed additional contract ADAIR aircraft and personnel and associated operational and maintenance activities would not affect water quality or quantity. Under the airspace, the use of defensive countermeasures has been found to be nontoxic. Due to the rare and infrequent nature of fuel dumps as well as in-place safety precautions such as altitude restrictions, these emergency procedures are not likely to adversely affect water resources; therefore, water resources are not carried forward for detailed analysis.
- **Section 4.4 Air Quality**. Increased air emissions resulting from contract ADAIR operations at JBLE-Langley are not considered significant under Alternatives 1 and 2. The proposed project would not interfere with the region's ability to maintain compliance with National Ambient Air Quality Standards for attainment area pollutants. Warning Areas W-386, W-72, and W-122 are not in regulatory control areas and are beyond state jurisdictional boundaries; moreover, modeling indicates that emissions would be dispersed over a wide area and are not expected to have significant impacts on air quality within the Warning Areas.
- **Section 4.5 Biological Resources**. Noise impacts from increased operations at JBLE-Langley would have a negligible, short- and long-term effect on wildlife. Risk reduction implementation measures associated with the bird/aircraft strike hazard (BASH) program would continue to reduce BASH potentially resulting in a minor impact on birds and other wildlife. No federally listed species are present at JBLE-Langley; therefore, no impacts are anticipated to any listed species from aircraft operations at the airfield. A slight increase in noise and sonic booms from supersonic flights are expected in the Warning Areas during training activities; however, these negligible noise increases would not impact wildlife in the Warning Areas. The use of chaff and flares would have no direct impact on wildlife; however, small plastic caps and pistons associated with the use of defensive countermeasures could make it to the surface of the Atlantic Ocean. The Air Force has found that these small residual plastic components could be consumed by marine mammals and sea turtles. As such, the use of defensive countermeasures during training activities in the Warning Areas may affect but is not likely to adversely affect listed marine mammals and sea turtles. There would be no impact on designated Critical Habitat. The National Marine Fisheries Service (NMFS) has concurred with a may affect but not likely to adversely affect determination for federally listed species. A no effect determination on federally listed terrestrial species has been made through the US Fish and Wildlife Service (USFWS), Virginia Field Office's self-certification process.

- **Section 4.6 Land Use.** Under the Proposed Action, the annual number of operations would increase by 25 percent and would not impact the operational capacity or necessitate changes to the locations or dimensions of the airspace around JBLE-Langley. Potential impacts on the airspace around the airfield for Alternatives 1 and 2 would be negligible. Likewise, the Warning Areas proposed for use have the capacity and the dimensions necessary to support additional sorties; therefore, negligible impacts on airspace are anticipated for Alternatives 1 and 2.
- **Section 4.10 Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances**. Hazardous wastes generated as a result of contract ADAIR operations would be stored and disposed in accordance with the JBLE-Langley Hazardous Waste Management Plan; therefore, no impacts from managing hazardous waste are expected. No impacts are expected from asbestos-containing materials and lead-based paint from interior renovations of proposed facilities with implementation of requirements described in the JBLE-Langley Asbestos Management Plan. Lighting fixtures containing polychlorinated biphenyls would be disposed in accordance with federal, state, and local laws, which would result in a long-term, minor, beneficial impact. There is a low potential for radon to pose a health hazard at JBLE-Langley. As such no impacts from radon are anticipated. There is no environmental contamination known to occur within the project area.

Enforceable Policies

The Virginia Coastal Resources Management Program contains the below enforceable policies (A-I).

A. Fisheries Management

This program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Marine Resources Commission (VMRC) (Virginia Code § 28.2-200 through § 28.2-713) and the DGIF (Virginia Code § 29.1-100 through § 29.1-570). The State Tributyltin (TBT) Regulatory Program monitors boating activities and boat painting activities to ensure compliance with TBT regulations promulgated pursuant to the amendment. The MRC, DGIF, and Virginia Department of Agriculture and Consumer Services share enforcement responsibilities (Virginia Code § 3.1-249.59 through § 3.1-249.62).

The proposed action would have no impact on finfish or shellfish resources. The increased use of chaff and flares does increase the potential for plastics associated with chaff and flares to end up in aquatic ecosystems and in the ocean; however, the amount of plastic material expended in the use of chaff and flares is small, the size of the plastic material is also very small, and most of the material would fall to the ocean floor at depths below which most fish species occur; however, the use of chaff and flares under Alternative 1 or 2 may have a minor adverse impact on fish species that are large enough to ingest plastic pieces that fall to the ocean floor on the small portion of the continental shelf that overlaps the boundaries of the Warning Areas, even though the likelihood of any large fish species encountering plastic caps from chaff and flares is extremely low.

The use of defensive countermeasures has been found to be nontoxic. Chaff chemical composition, rate of decomposition, and tendency to leach toxic chemicals under various situations paired with baseline substrate chemistry and conditions are factors that could potentially alter substrate chemistry. Silica (silicon dioxide), aluminum, and stearic acid are major components of chaff with minor quantities of copper, manganese, titanium, vanadium, and zinc in the aluminum chaff coating. All are generally prevalent in the environment, and all but titanium are either found in plants and animals and/or necessary

essentials for their growth. Silica does not present a concern to chemistry as it is found in silicate minerals, the most common mineral group on Earth. Silica is more stable in acidic environments than alkaline; however, ocean waters are slightly more alkaline than neutral (USEPA, 2019). Aluminum is also very abundant in the earth's crust, forming common minerals like feldspars, micas, and clays. While acidic and extremely alkaline substrates increase the solubility of aluminum, what is left eventually oxidizes to aluminum oxide which is insoluble. Stearic acid is used in conjunction with palmitic acid to produce an anticlumping compound for chaff fibers and both degrade when exposed to light and air (Air Force, 1997). The primary material in flares is magnesium, which is not highly toxic, and it is highly unlikely organisms would ingest flare materials. Some flares utilize impulse cartridges and initiates which contain chromium and sometimes lead, the amount of these substances is expected to be very small and dispersed over great distances.

Due to the rare and infrequent nature of fuel dumps as well as in-place safety precautions such as altitude restrictions, these emergency procedures are not likely to adversely affect water resources.

The proposed action would not include the use of marine antifoulant paints or other materials containing TBT.

B. Subaqueous Lands Management

This management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality (DEQ), Water Division. The program is administered by the VMRC (Virginia Code § 28.21200 through § 28.2-1213).

The proposed action would not impact subaqueous lands.

C. Wetlands Management

The purpose of the wetlands management program is to preserve tidal and non-tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.

The locations proposed for use on the installation are not located near wetlands and no ground-disturbing activities are proposed. There would be no need to fill or alter wetlands on JBLE-Langley; therefore, there are no impacts associated with wetlands on the installation under the proposed action.

D. Dunes Management

Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission (Virginia Code § 28.2-1400 through § 28.2-1420).

There are no sand dunes located in the project area; therefore, no impacts are anticipated.

E. Non-point Source Pollution Control

Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by DEQ (Virginia Code § 62.1-44.15:51 et seq.).

There would be no ground-disturbing activities and, therefore, no nonpoint source pollution would be generated.

F. Point Source Pollution Control

The point source program is administered by the State Water Control Board (DEQ) pursuant to Virginia Code § 62.1- 44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System permit program established pursuant to Section § 402 of the federal Clean Water Act and administered in Virginia as the Virginia Pollutant Discharge Elimination System permit program. The Water Quality Certification requirements of § 401 of the Clean Water Act of 1972 is administered under the Virginia Water Protection Permit program.

This project does not involve point source discharges subject to Section 402 of the Clean Water Act.

G. Shoreline Sanitation

The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth.

The proposed project does not involve septic tanks.

H. Air Pollution Control

The program implements the Federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). This program is administered by the State Air Pollution Control Board (DEQ) (Virginia Code § 10.1-1300 through § 10.1-1320).

This project will conform to the Virginia's State Implementation Plan. The region is in attainment for the current ozone standard because of historical nonattainment and maintenance designations for ozone, the primary pollutants of concern are nitrogen oxides (NO_x) and volatile organic compounds (VOC). VOCs for the proposed action are below the 100 tons per year (tpy) *de minimis* threshold. Levels of NO_x slightly exceeded the *de minimis* threshold under one scenario (see Section 4.4.2 of the EA); however, it is well below the Prevention of Significant Deterioration (PSD) threshold, indicating the project should not interfere with region's ability to comply with the NO_x NAAQS. The emissions are a concern because General Conformity requirements for the 1997 Ozone NAAQS may be reinstated at this location in the future. Carbon monoxide (CO) also exceeded 100 tpy (*de minimis* threshold) for the High and Low Emission Scenarios (see Section 4.4.2, Table 4-17 of the EA) and in one instance exceeded the 250 tpy threshold that triggers PSD analysis; however, the overall emissions for CO were quite small compared to the regional emissions. CO emissions were below 9 percent of regional stationary source emissions. When mobile source emissions are factored in, the CO emissions were less than 1.8 percent of regional emissions. Given the small regional contribution and the lack of a CO history in the Hampton Roads AQCR/Southeast Virginia Region (never a nonattainment or maintenance area for CO), the higher CO emissions associated with all three emission scenarios are not considered significant. For the remaining pollutants, the annual emission increases are not considered significant as they are below the 100 tpy *de minimis* threshold.

I. Coastal Lands Management

Coastal Lands Management is a state-local cooperative program administered by DEQ's Water Division and 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act (Virginia Code § 62.144.15:67–62.1-44.15:79) and Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Administrative Code 9 Virginia Code § 25-830-10 et seq.).

The proposed project does not involve land development.

Advisory Policies for Geographic Area of Particular Concern

A. Coastal Natural Resource Areas

Coastal Natural Resource Areas are areas that have been designated as vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. These areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas include the following resources: wetlands, aquatic spawning, nursing, and feeding grounds, coastal primary sand dunes, barrier islands, significant wildlife habitat areas, public recreation areas, sand gravel resources, and underwater historic sites.

The project area may contain spawning, nursing, and/or feeding grounds for finfish and shellfish. As previously discussed, a minor adverse impact on fish species that are large enough to ingest plastic pieces from chaff and flare use that fall to the ocean floor on the small portion of the continental shelf that overlaps the boundaries of the Warning Areas could occur; however, the likelihood of any large fish species encountering plastic caps from chaff and flares is extremely low.

Implementation of the Proposed Action involves compliance with Section 7 of the Endangered Species Act, and implementing regulations (50 CFR Part 402), requires communication with the USFWS and/or NMFS in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. The primary focus of this consultation is to request a determination of whether any of these species occur in the proposal area. Biological Evaluations were completed and forwarded to the USFWS and NMFS for the species and areas under their jurisdiction. The Air Force found that the small residual plastic components from chaff and flare use could be consumed by birds, marine mammals, and sea turtles. As such, the use of defensive countermeasures during training activities in the Warning Areas may affect but is not likely to adversely affect listed marine mammals and sea turtles. NMFS has concurred with a may affect but not likely to adversely affect determination for federally listed. A no effect determination on terrestrial listed species was made through the USFWS Virginia Field Office's self-certification process. There would be no impact on designated Critical Habitat.

The Magnuson-Stevens Fishery Conservation and Management Act (16 United States Code § 1801 et seq.) established a management system for marine fisheries resources in the United States. Congress charged National Oceanic and Atmospheric Administration Fisheries and fishery management councils, along with other Federal and State/Commonwealth agencies and the fishing community, to identify habitats essential to managed species, which include marine, estuarine, and anadromous finfish, mollusks, and crustaceans. These habitats, referred to as Essential Fish Habitat (EFH), include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." No in-water activities are proposed. The additional contract ADAIR sorties in the Warning Areas, including the use of defensive countermeasures, would have no impact on EFH.

B. Coastal Natural Hazard Areas

This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind-, tidal-, and storm-related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are highly erodible areas and coastal high hazard areas, including flood plains.

The proposed project does not involve construction of buildings or structures in coastal natural hazard areas.

C. Waterfront Development Areas

These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are commercial ports, commercial fishing piers, and community waterfronts.

The proposed action would not impact areas suitable for waterfront activities.

Advisory Policies for Shorefront Access Planning and Protection

A. Virginia Public Beaches

These public shoreline areas will be maintained to allow public access to recreational resources.

There are no public beaches within the project area; consequently, this project would not affect public access to beaches.

B. Virginia Outdoors Plan (VOP)

The VOP, which is published by Virginia's Department of Conservation and Recreation (DCR), identifies recreational facilities in the Commonwealth that provide recreational access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.

The proposed activity is not located near recreational resources and would have no impact on the VOP.

C. Parks, Natural Areas, and Wildlife Management Areas

The recreational values of these areas should be protected and maintained.

There are no parks, natural areas, or wildlife management areas on JBLE-Langley or beneath the airspace proposed for use.

Under the Noise Scenarios (see Section 4.2 of the EA), long-term negligible to minor increases in noise from the addition of contract ADAIR flight operations in the vicinity of the JBLE-Langley airfield are anticipated. These impacts are primarily the slight elongation of the day-night noise level (DNL) contours along the extended centerline of Runway 08/26 and the slight expansion for the DNL contours perpendicular to the runway during ADAIR departures, pitch arrivals, and closed pattern flight operations. As such, the 65-A-weighted-decibel contours extend further into the Plum Tree National Wildlife Refuge and the Grandview Nature Preserve than the baseline contours (**Figures 3**, **4**, and **5**).

Wildlife, and especially avian species, utilizing these bayshore areas for foraging and breeding would normally be sensitive to increased noise impacts from military aircraft. Although there is variability in

responses across species, many birds and wildlife have the ability to habituate to noise and movement from military aircraft (Grubb et al., 2010) and military aircraft operations have been ongoing at JBLE-Langley for decades. As such, the noise and movement from increased aircraft operations is anticipated to have negligible short-term and long-term impacts on wildlife, including birds breeding and foraging in nearby relatively undisturbed habitats.

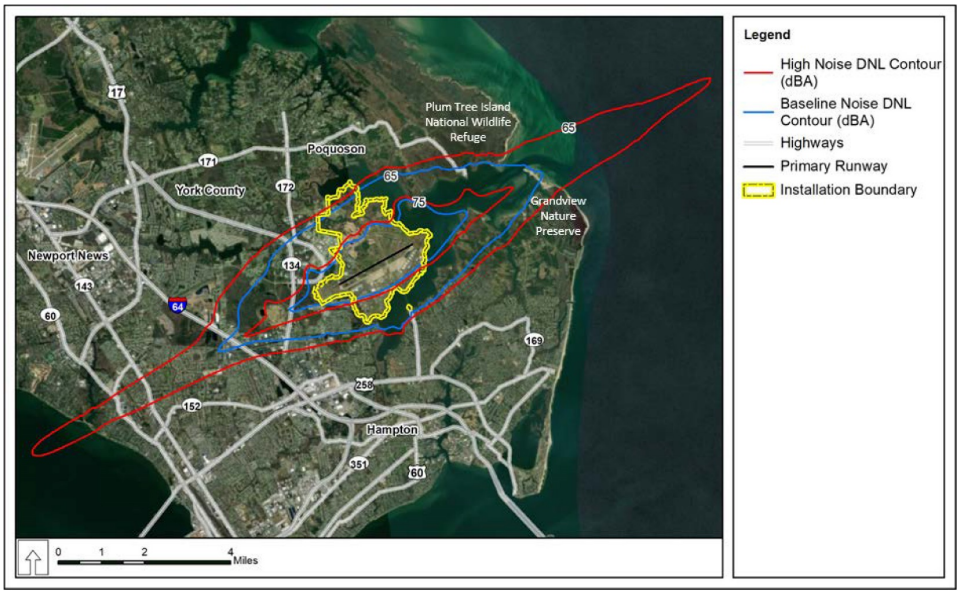


Figure 3. Comparison of High Noise Scenario and Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

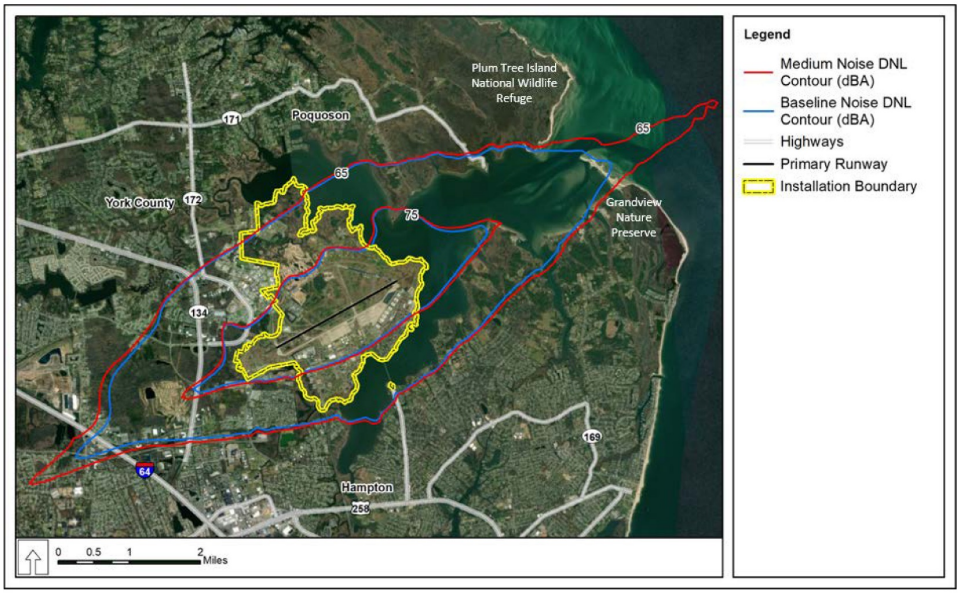


Figure 4. Comparison of Medium Noise Scenario and Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

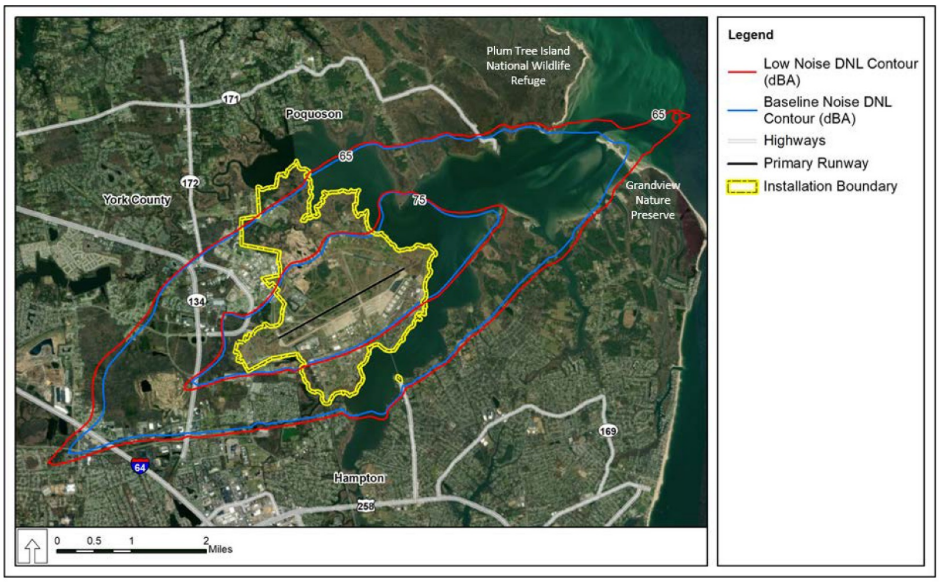


Figure 5. Comparison of Low Noise Scenario and Existing Day-Night Average Sound Level Contours at Joint Base Langley-Eustis, Langley Air Force Base.

D. Waterfront Recreational Land Acquisition

It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.

The proposed action does not limit the ability of the Commonwealth in any way to acquire, preserve, or maintain waterfront recreational lands.

E. Waterfront Recreational Facilities

Boat ramps, public landings, and bridges shall be designed, constructed, and maintained to provide points of water access when and where practicable.

The proposed action does not involve the design, construction, or maintenance of any boat ramps, public landings, or bridges.

F. Waterfront Historic Properties

The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shore front properties is primarily the responsibility of the Virginia Department of Historic Resources.

No shorefront properties would be affected by the proposed action. The Virginia Department of Historic Resources was provided the Draft EA for review with additional coordination conducted on 12 August 2019. The Virginia Department of Historic Resources concurred that there was no need for Section 106 consultation on the proposed action.

Consistency Determination

Based upon the information and analysis presented above and included in the EA, JBLE-Langley finds that the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Resources Management Program.

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

References

Air Force. 1997. *Environmental Effects of Self-protection Chaff and Flares: Final Report.* Prepared for Headquarters Air Combat Command, Langley Air Force Base, Virginia.

Grubb, T.Y, D.K. Delaney, W.W. Bowerman, and M.R. Weirda. 2010. *Golden Eagle Indifference to Heli-skiing and Military Helicopters in Northern Utah.* Journal of Wildlife Management 74:1275-1285.

USEPA. 2019. *Climate Change Indicators: Ocean Acidity.* <https://www.epa.gov/climate-indicators/climate-change-indicators-ocean-acidity>. Accessed April 2019.

Date: 30 Aug 19

Signature: Brenda W Cook

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