DRAFT

ENVIRONMENTAL ASSESSMENT

FOR

DEVELOPMENT OF ADDITIONAL HLZS AND DZS AT MOODY AIR FORCE BASE, GEORGIA

U.S. Army Corps of Engineers
Savannah District
and
U.S. Air Force Civil Engineer Center

June 2022

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ACRONYMS AND ABBREVIATIONS

%HA	Percent Highly Annoyed
µg/m^3	micrograms per cubic meter
23 FG	23d Fighter Group
23 WG	23d Wing
347 RQG	347th Rescue Group
ACAM	Air Conformity Applicability Model
AFB	Air Force Base
AGL	Above Ground Level
AOC	Area of Concern
AR	Army Regulation
BACT	Best Available Control Technology
BASH	Bird-Aircraft Strike Hazard
BMPs	Best Management Practices
CAA	Clean Air Act
CAS	Close Air Support
CDS	Container Delivery System
CEP	Combat Expendable Platform
CEQ	Center for Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_{2e}	Carbon Dioxide Equivalents
COC	Community of Comparison
CRL	Container Ramp Loads
CRS	Container Release System
CSAR	Combat Search and Rescue
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DNL	Day-Night Sound Level
DNL_{mr}	Onset-Adjusted Monthly DNL
DOPAA	Description of Proposed Actions and Alternatives
DZ	Drop Zone
EA	Environmental Assessment
EDGES	Effects Determination Guidance for Endangered & Threatened Species
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GNAHRGIS	Georgia Natural, Archaeological, and Historical Geographical Information System

HATR	Hazardous Air Traffic Report
HLZ	Helicopter Landing Zone
Hz	Hertz
KIAS	Knots Indicated Airspeed
LCADS-LV	Low Cost Aerial Delivery System - Low Velocity
LCLA	Low Cost/Low Altitude
LFE	Large Force Exercise
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
MOA	Military Operations Area
MR_NMAP	MOA Range NOISEMAP
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOTAM	Notice to Air Missions
NWI	National Wetlands Inventory
O_3	Ozone
Pb	Lead
PK 15[met]	Peak Level Exceeded Only 15 Percent of the Time
PM_{10}	Particulate Matter ≤ 10 micrometers
$PM_{2.5}$	Particulate Matter ≤ 2.5 micrometers
ppb	parts per billion
ppm	parts per million
PR	Personnel Recovery
PSD	Prevention of Significant Deterioration
ROI	Region of Influence
SATB	Simulated Airdrop Training Bundle
SEL	Sound Exposure Level
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO2	Sulphur Dioxide
SUA	Special Use Airspace
TCP	Traditional Cultural Properties
tpy	Tons Per Year
USACE	United States Army Corps of Engineers
USAF	United States Air Force
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Carbon

EXECUTIVE SUMMARY

Proposed Action

Moody Air Force Base (AFB) 23d Wing (23 WG) supports the training, equipment, and deployment of personnel for the operation of combat-ready aircraft including the HH-60W Pave Hawk, HC-130J Combat King II, and A-10C Thunderbolt II. The HH-60W combat rescue helicopter first arrived at Moody AFB in November of 2020, replacing its predecessor, the HH-60G. The key mission of the HH-60W is that of personnel recovery in both day and night operations. The HC-130J, a search and rescue variant of the Lockheed C-130 Hercules, is used for rapid deployment missions and ground personnel support and recovery. The aircraft has the ability to provide personnel and support equipment drops, as well as air-to-air helicopter refueling. The A-10C is a jet aircraft designed specifically for low altitude ground forces close air support (CAS), flying, and training within Moody AFB airspace.

Typical training operations occurring at Helicopter Landing Zones (HLZs) and Drop Zones (DZs) involve simulated CAS, Personnel Recovery (PR)/Combat Search and Rescue (CSAR) Missions, and monthly Large Force Exercises (LFEs).

The 23 WG has evaluated their current mission and the projected future missions at Moody AFB. Based on that evaluation, the 23 WG has deemed this Environmental Assessment (EA) as a mission critical need. The EA provides an environmental assessment of proposed actions for mission changes at the 23 WG, for the leasing of 5 properties to be used as HLZs and DZs for Moody AFB personnel and aircraft training operations. The Proposed Action HLZs and DZs are located in different areas of Atkinson, Clinch, and Echols Counties, Georgia, and Columbia County, Florida.

Purpose and Need for the Proposed Action

The purpose of the proposed action is to address scheduling conflicts and increase range space by leasing land for the development of three HLZs and two DZs within Moody AFB airspace. This will increase the ability of Attack and Rescue forces to prepare for major combat operations given extremely limited training and mission rehearsal areas and increased costs incurred by off-station/Temporary Duty Travel requirements to adequately prepare for real world missions. Activities at HLZs include helicopter landings, ground troop training, and flyovers by helicopters and fixed-wing aircraft. The DZs will be utilized as multi-use areas. Activities at DZs will include all HLZ activities as well as airdrops of equipment and personnel by fixed wing aircraft.

The proposed action is needed to alleviate recurring scheduling conflicts and provide more realistic and varied training areas for the 23d Wing's 23d Fighter Group (23 FG) and 347th Rescue Group (347 RQG) aircraft. The lack of space in current HLZ/DZ training areas lends itself to lost training proficiency and currency, which in turn drives up the man hour costs when use of alternate training areas distant to Moody AFB and its airspace is required. New HLZs and DZs within Moody AFB airspace are required to properly simulate current mission realities and ensure comprehensive training.

Alternatives Considered

Alternatives were selected for analysis based upon the following screening criteria: Airspace, Size, Compatibility, Proximity, Accessibility, and Safety Requirements. As part of the site selection

process, potential HLZs/DZs sites (more than 25) were initially identified by the 347 RQG flyovers of the areas surrounding Moody AFB and subsequent visual surveys by groundcrews. All potential sites were screened against the previously defined criteria by Moody AFB.

Two alternatives for the selection of HLZs and DZs were considered: the Action Alternative (Alternative 1), and the No Action Alternative. Under the action alternative, the proposed action HLZ and DZ properties would be used as training areas by Moody AFB. The L2-A HLZ, L4-3 HLZ, HLZ 11, L3-2 DZ, and 75.8 DZ parcels would be potentially leased from their respective property owners. Moody AFB may make a final determination that one or more of the listed parcels may not be selected for lease. Under the No-Action Alternative, none of the proposed action HLZ and DZ sites would be leased for usage by Moody AFB. The properties would remain in possession of their respective owners.

Summary of Environmental Resources Evaluated in the EA

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

The following resource areas have been addressed in this EA: Noise, Air Quality, Water Resources, Safety and Occupational Health, Biological/Natural Resources, and Socioeconomic Resources/Environmental Justice. Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in this EA: Hazardous Materials/Waste, Cultural Resources, and Earth Resources.

Summary of Potential Environmental Consequences of the Action Alternatives

Noise. Noise is defined as unwanted sound or, more specifically, as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise can vary according to the type and characteristics of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day. Noise impacts related to the proposed HLZs/DZs would be negligible and not significant.

Air Quality. Poor air quality can have effects on public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Efforts to maintain air quality standards protect public welfare and prevent damage to animals, crops, vegetation, buildings, and visibility. Air emissions from the proposed action are summarized in Table 4.3. Air emissions from the proposed HLZs/DZs would be less than the *de minimis* (i.e., significant) and not significant enough to warrant further NEPA analysis.

Water Resources. Water features on and around Moody AFB consist of wetlands, ponds, lakes, and perennial and intermittent streams. These features provide drinking water and recreation for the local communities, as well as habitat and ecosystem benefits for plant and animal species. Water resources impacts (surface waters, floodplains, and wetlands) vary by HLZ/DZ site, but would either have no impact or negligible impact to these resources.

Safety and Occupational Health. A safe environment is one in which there is little to no potential for serious bodily injury or illness, death, or property damage, or the potential risk has been reduced to the maximum extent possible. Safety addresses the well-being, safety, and health of

members of the public, contractors, and DAF personnel during project implementation, including demolition and construction, and also during subsequent operations and maintenance activities associated with the proposed action. Safety impacts related to the proposed HLZs/DZs would be negligible and not significant.

Biological/Natural Resources. Moody AFB and the surrounding areas boast a highly diverse environment for biological and natural resources, containing several distinctive vegetation communities, as well as numerous wildlife habitats and species. There would be no significant impacts to biological resources at any of the HLZs or DZs associated with implementation of the Proposed Action.

Socioeconomic Resources/Environmental Justice. Socioeconomic resources include the basic attributes and resources associated with the human environment. In particular, this includes population and economic activity. Economic activity typically encompasses employment, personal income, and industrial growth. No significant socioeconomic or disproportionate impacts to minority, low-income, or youth populations are anticipated under the Proposed Action.

Public Involvement

The Air Force solicited public and agency comments during a scoping period on June 24, 2022. Comments received during the scoping period were considered in preparing the EA. The Air Force circulated the Draft EA/Environmental Impact Statement (EIS) for public review on June 24, 2022 for a 30-day review period. Comments received and responses will be provided in **Appendix A** of the Final EA.

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1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

This Description of the Proposed Action and Alternatives (DOPAA) supports the proposed development of three Helicopter Landing Zones (HLZs) and two Drop Zones (DZs) near Moody Air Force Base (AFB), Georgia. The developed HLZs and DZs would free up additional range space and establish new training opportunities for the 23d Wing's (23 WG) 347th Rescue Group (347 RQG). Activities at HLZs would involve helicopter landings, ground troop training, and flyovers by helicopters and fixed-wing aircraft. The DZs will be utilized as multi-use areas and activities would involve all HLZ activities as well as airdrop of equipment and personnel by fixed wing aircraft. The proposed land areas for the HLZs and DZs are privately owned and would be utilized by the Air Force under lease agreements with the respective owners.

The National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] Section 4321-4347) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before those actions are taken. The intent of NEPA is to help decision-makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ), which was charged with developing implementing regulations and ensuring federal agency compliance with NEPA. The CEQ regulations mandate that all federal agencies use a prescribed structured approach to environmental impact analysis. This approach also requires federal agencies to use an interdisciplinary and systematic approach in their decision-making process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

The process for implementing NEPA is codified in Title 40 Code of Federal Regulations (CFR), Parts 1500-1508, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. The CEQ was established to implement and oversee federal policy in this process. The CEQ regulations specify that an Environmental Assessment (EA) must be prepared to provide evidence and analysis for determining whether to prepare a Finding of No Significant Impact (FONSI) and, when applicable, Finding of No Practicable Alternative (FONPA) (see **Section 1.5**), or whether the preparation of an Environmental Impact Statement (EIS) is necessary.

To comply with NEPA, as well as other pertinent environmental requirements, the decision-making process must include the development of a DOPAA to address the environmental issues related to the Proposed Actions. The DOPAA would be incorporated as the first two chapters of an EA as required by the United States Air Force (USAF) Environmental Impact Analysis Process (EIAP) (32 CFR Part 989).

1.2 PROJECT LOCATION AND BACKGROUND

Moody AFB is an active United States Air Force installation in south-central Georgia, ten miles northeast of Valdosta, Georgia (**Figure 1-1**). The installation occupies approximately 10,843 acres of land and is bordered to the north and west by small farms and residences, to the east by the Grand Bay Range, and to the south by the Grand Bay Wildlife Management Area. Nearby cities include Valdosta, Georgia, about ten miles southwest, and Lakeland, Georgia, about seven

miles northeast. Moody AFB is approximately 85 miles northeast of Tallahassee, Florida, and 120 miles northwest of Jacksonville, Florida.

From 1941 to 1975, Moody AFB served as a pilot training base. The base was named Moody Field under the Army Air Corps, and later became Moody Air Force Base under the Air Training Command after the Air Force became and independent service in 1947. The 3550th Flying Training Wing operated at Moody until it was deactivated in 1973, with the 38th Flying Training Wing activated in its place. The 38 Flying Training Wing was inactivated in 1975 and the 347th Tactical Fighter Wing was activated with transfer of the base to Tactical Air Command. The 347 Tactical Fighter Wing was re-designated the 347th Wing in 1994 as a composite wing under merger of Tactical Air Command and Strategic Air Command to Air Combat Command. In 2001 the base's primary mission changed to that of search and rescue with re-designation as the 347th Rescue Wing and realigned in 2003 under Air Force Special Operations Command. In 2006, the 23d Fighter Group "Flying Tigers" was assigned to Moody AFB when the base realigned back to Air Combat Command, and the Rescue Wing reverted back to the 347 RQG as a subordinate unit under the base's new host unit, the 23d Wing.

Moody AFB's 23 WG supports the training, equipment, and deployment of personnel for the operation of combat-ready aircraft including the HH-60W Pave Hawk, HC-130J Combat King II, and A-10C Thunderbolt II. The HH-60W combat rescue helicopter first arrived at Moody AFB in November of 2020, replacing its predecessor, the HH-60G. The key mission of the HH-60W is that of personnel recovery in both day and night operations. The HC-130J, a search and rescue variant of the Lockheed C-130 Hercules, is used for rapid deployment missions and ground personnel support and recovery. The aircraft has the ability to provide personnel and support equipment drops, as well as air-to-air helicopter refueling. The A-10C is a jet aircraft designed specifically for low altitude ground forces close air support (CAS), flying, and training anywhere between 100 and 18,000 feet above ground level (AGL) within Moody AFB airspace.

Typical training operations occurring at HLZs and DZs involve simulated CAS and Personnel Recovery (PR)/Combat Search and Rescue (CSAR) Missions. Daily training for HH-60 PR/CSAR missions begin with flight at altitudes between 100 and 150 feet AGL when in route to the HLZ/DZ. Once the HLZ/DZ has been reached, between 30 minutes to two hours are spent conducting training activities, including pattern practice within a 2-mile radius. Following the completion of pattern practice, the remaining time is spent hovering at different altitudes or resting stationary on the ground. Fifty percent of training operations take place in nighttime conditions. Opposing force training may involve up to two ground vehicles and ten personnel setting up perimeters, and two personnel acting as survivors. C-130 DZ utilization is typically limited to personnel drops via static line or military freefall, as well as equipment drops simulated by 600-pound water barrels, 30-pound containers of sand, or 3000-pound pallets of rubber railroad ties. The aircraft will ingress at altitudes of 300 to 500 feet AGL and complete airdrops from 150 to 18,000 feet AGL. After dropping the package, the aircraft will loiter at drop altitude and orbit offset by approximately 5 to 10 miles. A-10 CAS missions typically involve multiple low passes and simulated firing of the nose-mounted 30 mm cannon at mockup ground targets.

These training actions are combined at least monthly to orchestrate a Large Force Exercise (LFE). Typical LFEs involve a C-130 making radio contact with a simulated survivor at the HLZ, then dropping supplies or personnel via parachutes into the area. HH-60s arrive to make contact with

the survivor, simulating small arms fire on ground forces before extraction. A-10s may provide simulated CAS, flying between 100 feet to 18,000 feet AGL.

Training operations take place within the Moody Airspace Complex, which overlies Moody AFB and sections of southern Georgia and northern Florida. Training missions primarily utilize low-altitude airspace, with approximately 37,000 flight operations per year taking place within mid and low-altitude Military Operations Areas (MOAs) (AICUZ, 2015). Low altitude training for these missions requires the use of Special Use Airspace (SUA), including the Moody 2 North and Moody 2 South MOAs, and restricted areas of the Grand Bay Range including R-3008A, R-3008B, and R-3008C. These SUAs provide the necessary conditions to support mission training requirements but are limited due to high utilization rates of up to 90 percent. A-10s utilize the same airspace that HH-60s and C-130s use for their helicopter air-to-air refueling exercises. Additionally, the Bemiss Field DZ is used by both the HH-60 for landing and hovering operations and C-130 for personnel and equipment drops. While this airspace is being used by either aircraft, the A-10 is unable to conduct any air-to-ground CAS training.

The Proposed Action HLZs and DZs are located in different areas of Atkinson, Clinch, and Echols Counties, Georgia, and Columbia County, Florida (**Figure 1-2**). One of the proposed HLZs and one of the proposed DZs are privately owned by one owner, and two proposed HLZs and one proposed DZ are owned by another private owner.

Figure 1-1: Project Location

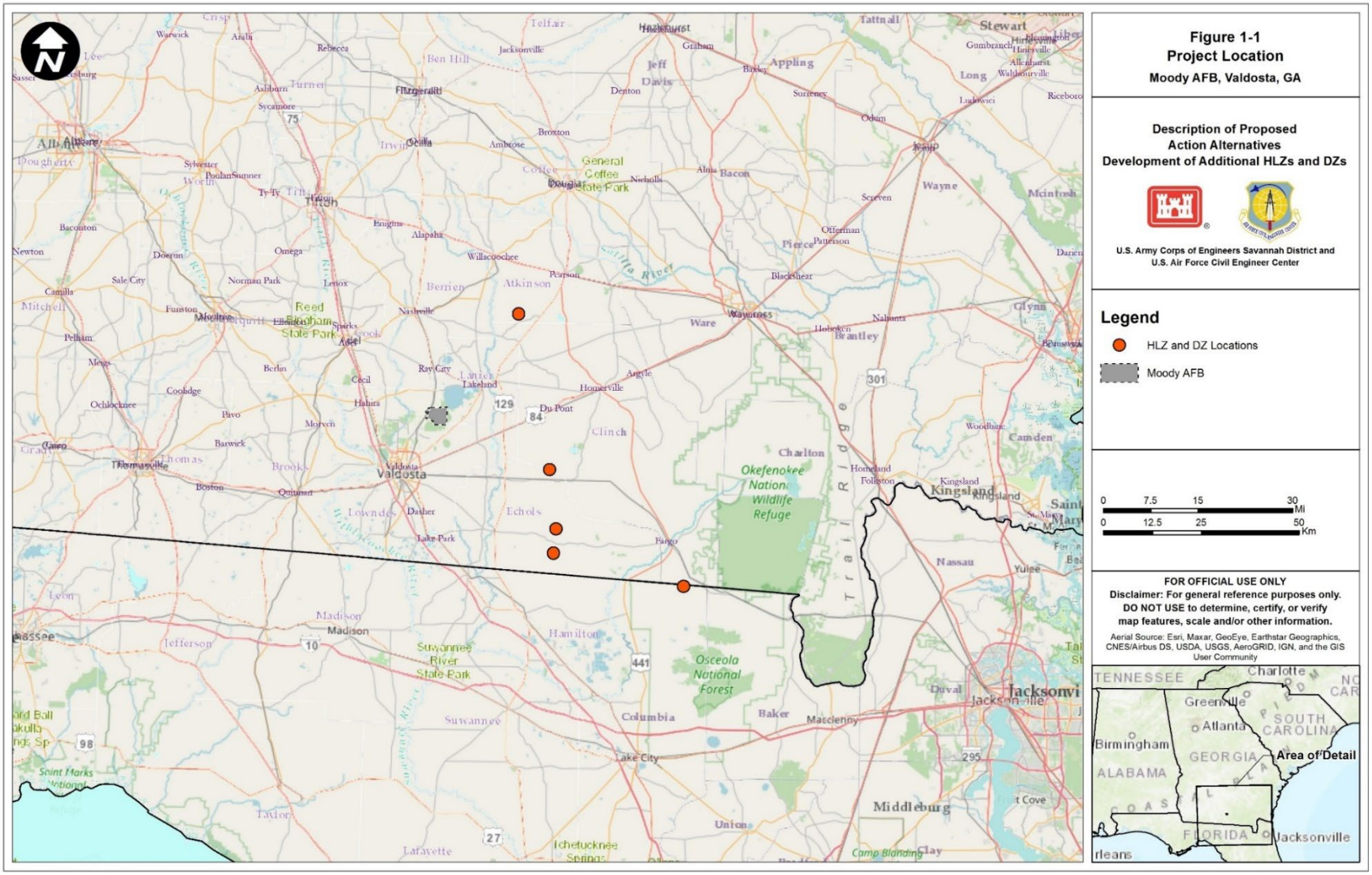
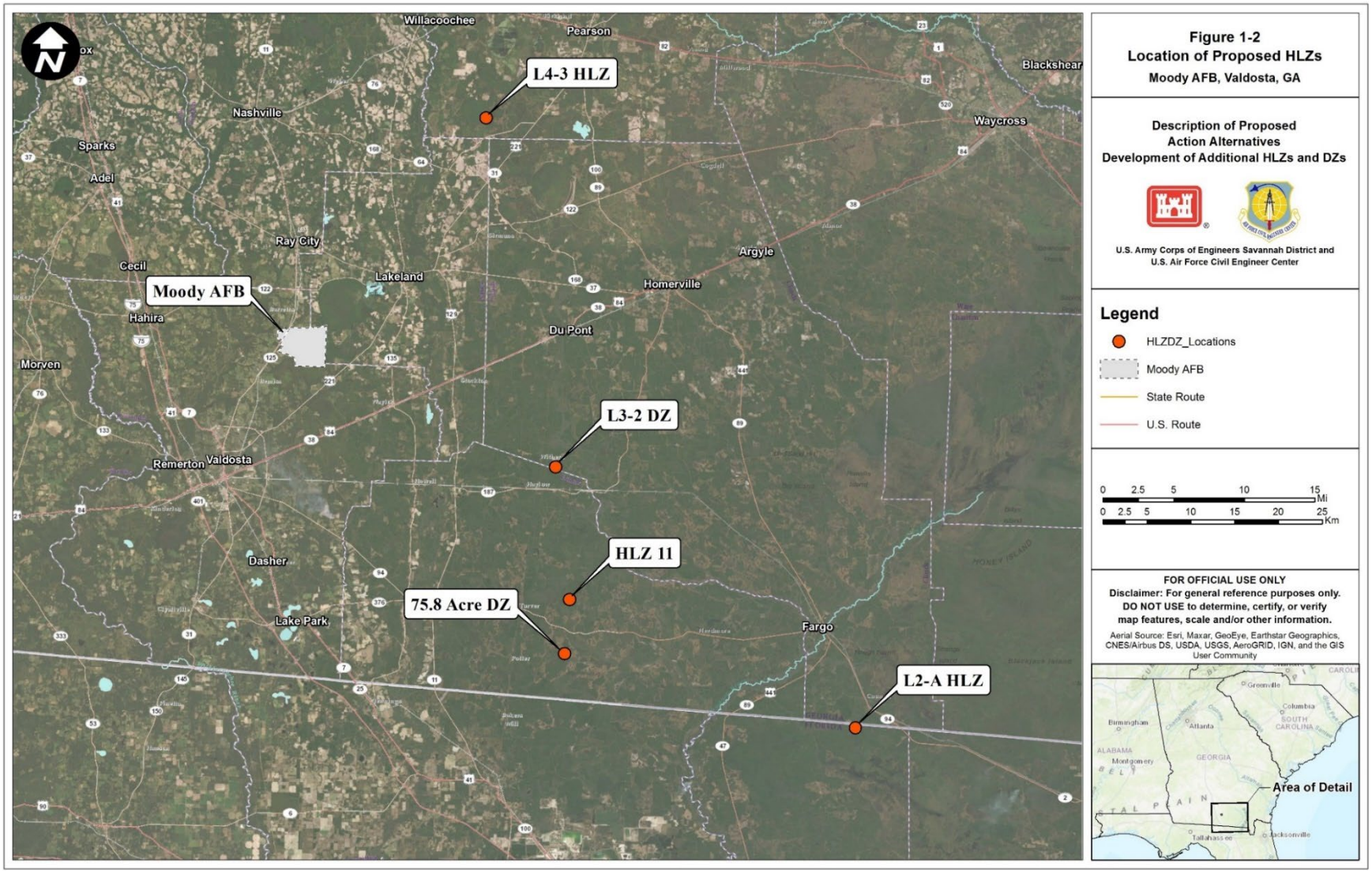


Figure 1-2: Location of Proposed HLZs



1.3 PURPOSE OF THE ACTION

The purpose of the proposed action is to address scheduling conflicts and increase range space by leasing land for the development of three HLZs and two DZs within Moody AFB airspace. This will increase the ability of Attack and Rescue forces to prepare for major combat operations given extremely limited training and mission rehearsal areas and increased costs incurred by off-station/Temporary Duty Travel requirements to adequately prepare for real world missions.

1.4 NEED FOR THE ACTION

The proposed action is needed to alleviate recurring scheduling conflicts and provide more realistic and varied training areas for the 23d Wing's 23d FG and 347th RQG aircraft. The lack of space in current HLZ/DZ training areas lends itself to lost training proficiency and currency, which in turn drives up the man hour costs when use of alternate training areas distant to Moody AFB and its airspace is required. New HLZs and DZs within Moody AFB airspace are required to properly simulate current mission realities and ensure comprehensive training.

1.5 DECISION TO BE MADE

The decision to be made is the selection of an alternative for Moody AFB to support the development of HLZs and DZs near the base. This EA evaluates the potential environmental consequences of implementing the proposed action as described in **Section 2.1**, Proposed Action.

Based on the analyses conducted in support of this EA, the USAF would 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 FONSI or FONSI/FONPA allowing implementation of the selected alternative.
2. Initiate preparation of an EIS if it is determined that significant impacts would occur as a result of implementation of the action alternatives; or
3. Select the no-action alternative, whereby the proposed action would not be implemented. As required by NEPA and its implementing regulations established by CEQ, preparation of an environmental document must precede final decisions regarding a federal action and be available to inform decision-makers of the potential environmental impacts. Moody AFB can also defer a decision and not pick any of the alternatives, in which case a FONSI would not be signed.

1.5.1 Issues Not Carried Forward for Detailed Analyses

Based on the scope of the Proposed Action, issues with minimal or no impacts were identified through a preliminary screening process. The following describes those issues not carried forward for a detailed analysis, along with the rationale for their elimination.

<u>Surface Waters and Water Quality</u>

Groundwater, Stormwater, and Water Supply

No ground-disturbance activities are associated with the Proposed Action, so the proposed project is not likely to affect groundwater, stormwater, or water supply. Furthermore, personnel and vehicles would avoid any adjacent wetlands and/or waterways, and proposed training

activities at each site would not involve construction or land disturbance. As a result, the Air Force has not identified any potential for direct or indirect impacts to these water resources resulting from the Proposed Action, and these resource areas have not been carried forward for detailed analysis.

Hazardous Materials/Waste

The Proposed Action would not involve planned utilization of hazardous materials or the generation of hazardous wastes. Potential non-hazardous waste generated from HLZ/DZ operations include release from training munitions which include training rounds, smoke cartridges, chemical light sticks, and ground-burst simulators. Moody AFB personnel will collect all training munitions at the end of each exercise as detailed in **Section 2.1**. Military munitions, including training munitions, are not classified as a solid waste if they are used for their intended purpose (training), and are reclaimed, repaired, or reused (40 CFR § 266, Subpart M-Military Munitions). Munitions utilized as part of this proposed action fall into these categories and are therefore not considered solid waste. A material not defined as solid waste is not classified as a hazardous material, as defined in 40 CFR § 261.3, Definition of a Hazardous Waste. Potential waste release may also occur from utilization of ground vehicles in exercises. Vehicles may occasionally leak petroleum-based compounds such as engine oil, transmission fluid, or gasoline/diesel. Leakage or accidental discharge of these compounds is anticipated to release minimal amounts of material to the proposed action areas. If releases were detected, cleanup by USAF personnel would ensure no further contamination to the surrounding environment. Logging operations responsible for the clearing of the HLZ/DZ parcels also utilizes several ground vehicles for hauling of lumber and slash cleanup. Any releases from USAF ground vehicles are not anticipated to exceed baseline conditions created from vehicle leakage during logging operations. Hazardous materials use or generation of hazardous wastes is not anticipated at the HLZ/DZ properties. Therefore, this issue was not carried forward for further analysis.

Cultural Resources

No ground-disturbance activities are associated with the four HLZs in Georgia (L4-3, L3-2 DZ, HLZ 11, and 75.8 DZ) or the single HLZ in Florida (L2-A), thus the proposed project is not likely to affect archaeological or architectural resources Additionally, all the proposed sites have been disturbed previously over periods of many years as part of agricultural or silvicultural activities; thus, the potential for any cultural resources are extremely low. No archaeological sites or historic properties have been recorded within 1.5 miles of any of the four proposed sites in Georgia (Georgia's Natural, Archaeological and Historic Resources GIS, 2022) or the one site in Florida (Florida Master Site File maintained by FL Division of Historical Resources, 2022). As a result, the Air Force does not anticipate impacts to cultural resources, and this resource area was not carried forward for detailed analysis. Moody AFB provided notification of the Proposed Action and requested concurrence on a finding of no effect to cultural resources from the Georgia State Historic Preservation Officer (SHPO), as well as no effect to traditional cultural properties (TCPs) from 7 tribes (a list is provided in **Appendix A**). Received responses from the SHPO and / or any tribes to the proposal will be included in **Appendix A**) of the Final EA.

Earth Resources

There would be no construction or land-disturbance activities associated with the Proposed Action and thus no potential for geology impacts, topography changes, or soil erosion issues. The sites are cleared areas within active pine plantations and will be mowed quarterly to maintain low vegetation conditions. Any fugitive dust from rotor wash associated with helicopters, equipment movement, or other activities would not be expected to result in any significant soil displacement or erosion over and above fugitive dust resulting from normal planting and harvesting activities that utilize heavy equipment. Additionally, terms of the lease agreement would address use requirements to prevent negative impacts on soil productivity. The Air Force has not identified any potential impacts to geology, soils, or topography under the Proposed Action, so these resource areas have not been carried forward for detailed analysis.

Utilities

There would be no new utility connections or increases in utility use associated with the Proposed Action and no impact to utility resources at Moody AFB or the surrounding community. As a result, this resource area was not carried forward for further analysis.

Airspace

With the exception of HLZ L2-A, all proposed HLZs/DZs would be within the boundaries of SUA Moody 2 North and Moody 2 South MOAs. Proposed HLZ L2-A is along the Georgia and Florida border and east of the Moody 2 South MOA where numerous aviation navigation routes exist, including T-route 204 (T-204), Military Instrument Route 23 (IR-23), and Victor Airway (V-157). IR-23 has a floor of 100 feet AGL and originates at Marine Corps Air Station Cherry Point, which is also the scheduling agency for this route. Civilian route V-157 has a minimum altitude of 2,300 feet above mean sea level (msl) and T-204 is low level navigational route with an altitude floor of 1,200 feet msl. Within the SUA, there would be no increases in flight operations to conflict with existing civilian, commercial, and military use of the regional airspace, and no changes to airspace designations would occur nor would new airspace be created. Further, given that compliance with all airspace management procedures would continue, infrequent operations at HLZ L-2A would not result in any airspace conflicts. Pilots would continue to comply with Federal Aviation Administration (FAA) regulations and avoid congested areas of a city, town, or settlement or any open-air assembly of people by 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. Outside congested areas, pilots would avoid persons, vessels, vehicles, or structures by 500 feet. The Proposed Action would have negligible impacts to airspace management and use. Potential safety conflicts with other users of this airspace are discussed in **Section 4.4**, Safety and Occupational Health. Consequently, the Air Force has not identified airspace as an issue of concern and this resource area has not been carried forward for detailed analysis.

1.6 COOPERATING AGENCY AND INTERGOVERNMENTAL COORDINATION/CONSULTATIONS

1.6.1 Cooperating Agency

In accordance with CEQ regulation 40 CFR § 1508.5, a cooperating agency may be any federal agency that has jurisdiction by law or special expertise with respect to environmental impacts expected from a proposal. Responsibilities of a cooperating agency include early participation in

the NEPA process; developing information and preparing portions of the EA for which the cooperating agency has special expertise, at the request of the lead agency; and providing staff support to enhance the lead agency's interdisciplinary capability. There are no cooperating agencies for this NEPA document.

1.6.2 Interagency and Intergovernmental Coordinations and Consultations

Federal, state, and local agencies with jurisdiction that could be affected by the Proposed Action were notified during the development of this EA. Scoping letters were distributed to relevant Federal, state, and local agencies on April 29, 2022 notifying them of the Proposed Action and requesting input on the scope of the EA. Copies of all correspondence with Federal, state, and local agencies are included in **Appendix A**.

1.6.3 Government to Government Consultations

Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000), directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands. To comply with legal mandates, federally recognized tribes that are affiliated historically with the Moody AFB geographic region will be 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 coordination process is distinct from NEPA consultation or the Interagency/Intergovernmental Coordination for Environmental Planning processes and requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The Moody AFB point-of-contact for Native American tribes is the Installation Commander. The Moody AFB point-of-contact for consultation with the Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation is the Cultural Resources Manager.

The Native American tribal governments that will be coordinated with regarding this action are listed in **Appendix A**.

1.7 PUBLIC AND AGENCY REVIEW OF EA

A Notice of Availability (NOA) for the Draft EA and FONSI/FONPA will be published in the Valdosta Daily Times, Echols Echo, Clinch County News, Atkinson County Citizen, and The Lake City Reporter (FL) announcing the availability of the Draft EA for review. The publication of the NOA will initiate a 30-day review period. A copy of the Draft EA will be made available for review at the South Georgia Regional Library (2906 Julia Drive, Valdosta, Georgia 31602), Allen Statenville Library (123 US-129, Statenville, Georgia 31648), Clinch County Public Library (478 W Dame Ave, Homerville, Georgia 31634), Pearson Public Library (56 E Bullard Ave, Pearson, Georgia 31642) and the Columbia County Public Library (308 NW Columbia Ave, Lake City, Florida 32055). A copy of the Draft EA will also be made available for review online at http://www.moody.af.mil/Resources/Environmental-Initiative. At the closing of the public review period, applicable comments from the general public and interagency and intergovernmental coordination and consultation will be incorporated into the analysis of potential environmental impacts performed as part of the EA, where applicable, and included in of the Final EA.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

This section describes the Proposed Action and the alternatives that the USAF is considering fulfilling the purpose of and need for the Proposed Action (refer to **Section 1.3** and **Section 1.4**). The NEPA process evaluates potential environmental consequences associated with the Proposed Action and its action alternatives carried forward for further analysis. In addition, CEQ Regulations for Implementing the Procedural Provisions of NEPA (Title 40 CFR Parts 1500-1508) specify that an EA must include a No-Action Alternative against which potential impacts can be compared. The No-Action Alternative would not satisfy the purpose of or need for the Proposed Action; however, it has been carried forward for analysis in accordance with CEQ regulations.

The proposed action is to lease five parcels of land for the development of HLZs and DZs near Moody Air Force Base. Two of the proposed parcels (the DZs) will be utilized as drop zones and helicopter landing zones, with the remaining three smaller parcels (HLZs) used exclusively as helicopter landing zones. The Air Force intends to use these parcels primarily for daily HH-60 personnel recovery and aircrew training. Monthly LFEs will be conducted at the larger drop zone parcels, involving ground crew presence and concurrent airspace occupation by HH-60s, C-130s, and A-10s. A detailed description of HLZ/DZ training operations can be found in **Section 1.2**. **Table 2-1** summarizes the HLZ and DZ details.

Table 2-1: Proposed HLZ Details

HLZ Name	Type	County	Size (acres)	Location (Latitude / Longitude)	Owner	Current Primary Land Use
L2-A	HLZ	Columbia (FL)	1	82°31.363'W / 30°35.045'N	Langdale Properties	Undeveloped
L4-3	HLZ	Atkinson	1	82°58.483'W / 31°12.320'N	Langdale Properties	Undeveloped
HLZ 11	HLZ	Echols	1	82°51.917'W / 30°42.707'N	The Westervelt Company	Undeveloped
L3-2 DZ	DZ	Clinch	83	82°53.077'W / 30°50.873'N	Langdale Properties	Undeveloped
75.8 DZ	DZ	Echols	76	82°52.193'W / 30°39.358'N	The Westervelt Company	Undeveloped

The 347 RQG would utilize these HLZs and DZs for PR training activities, and routing to a particular HLZ or DZ is mission-dependent and variable from one mission to the next. Typical PR training missions include day-to-day training and more elaborate once-per-month training events.

Day-to-Day Training:

Day-to-day training involves typical flight training operations associated with tactical and remote training and fulfills the basic PR training requirements.

Helicopter (HH-60) Operations:

- There are typically two sorties per week, but there may be up to six sorties per week at specific HLZs/DZs based on existing weather and mission needs. There are two HH-60s per sortie; sometimes the craft will split up, each going to different HLZs/DZs to practice.
- En route from Moody AFB to a particular HLZ/DZ, helicopters would fly at 100-500 feet AGL and 110-120 knots indicated airspeed (KIAS).
- Each helicopter would spend between 30 minutes and two hours conducting training activities before returning to the base.
- About 50 percent of the aircraft's time is spent flying patterns: 80 percent of that time consists of circling or other pattern work within approximately 1-mile radius of the HLZ/DZ; 20 percent of the time is spent running upwind/downwind patterns or other pattern work within a 2-mile radius of the HLZ/DZ.
- The remaining 50 percent of the aircraft's time is spent at the HLZ/DZ. About 80 percent of this time, the aircraft hovers (stationary) at different altitudes depending on the training activity for PR personnel: 75 feet AGL for practicing hover or rappel activities from the aircraft; between 45 and 35 feet AGL for fast ropes; and at 15 feet AGL for rope ladders. The remaining 20 percent of time at the HLZ/DZ, the aircraft is stationary on the ground with engines running and rotors turning.
- Night operations make up about 50 percent of total sorties, with approximately 20 percent occurring after 10:00 PM. Training is not typically conducted after midnight because the Moody AFB tower closes at 1:00 AM, and the aircraft need time to return to base. There is typically no flying on weekends or holidays.

Occasional Training:

More than once a month, but less than daily, a LFE training exercise occurs at a particular HLZ/DZ; the HLZs/DZs are rotated each month for LFE operation. Typical operation involves a C-130 aircraft making contact with a simulated survivor at the HLZ/DZ, then dropping either personnel (via parachutes) or sandbags to the HLZ/DZ area; then HH-60(s) arrive, make contact with the simulated survivor, simulate firing on enemies and then extract all friendly forces. A-10 aircraft may also provide simulated CAS. The LFE training exercise includes the following components.

Helicopter (HH-60) Operations:

- Activities for the HH-60's occasional training are similar to those previously described under "Day-to-Day Training".

Opposing Forces:

- Activities include two ground vehicles and approximately ten personnel at each HLZ/DZ.
- Personnel set up perimeters around the HLZ/DZ as "opposing forces" while one or two personnel act as "survivors".

- To provide for more realistic training, personnel utilize training munitions to create a realistic combat experience. All remnants (casings, trash, etc.) are collected at the end of the training session, and no rounds are fired from aircraft because shell casings cannot be collected effectively. Expendables include:
    - Approximately 100 7.62-mm (M240) rounds per month
    - Approximately 500 5.56-mm (M4) rounds per month
    - Approximately four Mk-18 and one Mk-23 smoke cartridge per month
    - Chemical light sticks
    - Approximately two ground-burst simulators per LFE.
- Training activities may also include towable or inflatable full-sized mockups of threats as well as portable low power radar emitters, infrared/ultraviolet threat emitters, eye-safe laser spotting, and other visual threat representation equipment. For realism and other simulated operational requirements, the threat setup areas would generally be on or within one mile of the exercise area on the side of roads, rights of way, or other approved areas.

C-130 (Fixed-Wing Aircraft) Operations:

- The C-130 is utilized to make drops of equipment and supplies and would occur as part of "Day-to-Day Training". The C-130 typically makes radio contact at the DZ, offset from the DZ by flying between 300-1,000 feet AGL, conducts the drop, and then moves to orbit at drop altitude within ten miles of the DZ, with run-ins typically at 130-140 KIAS.
- Drops consist of either personnel airdrops (i.e., parachute jumps), standard airdrop training bundles (i.e., sandbags of about 5-15 pounds), Unilateral Airdrop Training bundles (i.e., four 55-gallon water barrels weighing 600-700 pounds or 3000 pounds of rubber railroad ties). **Table 2-2** identifies the minimum C-130 drop zone size for each DZ.
- An observer is required on the ground to confirm that the area is clear prior to the drop.

Table 2-2: Minimum DZ Size for C-130 Drops

Airdrop	Type	Width	Length
Personnel Airdrop	Static Line (800 to 3000 feet AGL)	600 yards to 1,200 yards	600 yards to 1,200 yards
		This is for one jumper. Add 75 yards to the trailing edge depending on number of jumpers leaving the airplane.	
	Military Free Fall (3,000 to 18,000 feet AGL)	Determined by Jumpmaster based on team proficiency. Could be as small as a 50-yard radius circle (tactical DZ).	
Unilateral Airdrop Training	SATB (150 to 3000 feet AGL)	300-yard radius circle	
	CDS, CRS, CRL, LCLA, LCADS-LV, CEP	400 yards to 1,360 yards	400 yards to 1,810 yards
	Heavy Equipment	600 yards to 1,200 yards	1,000 yards to 1,600 yards

AGL = above ground level; DZ = drop zone; SATB = simulated airdrop training bundle; CDS = Container Delivery System; CRS = Container Release System; CRL = Container Ramp Loads; LCLA = Low Cost/Low Altitude; LCADS-LV = Low Cost Aerial Delivery System - Low Velocity; CEP = Combat Expendable Platform

A-10 (Fixed-Wing Aircraft) Simulated CAS:

- A-10 aircraft may make multiple passes to simulate CAS within the boundaries of the established MOAs.
- A-10 aircraft would fly at 100 feet AGL to 18,000 feet AGL at 300-350 KIAS operating within the MOA under normal CAS and airspace procedures.

Special Considerations:

The following special considerations are included as part of the Proposed Action:

- Lights on residences are not a problem for HH-60s.
- There are no requirements to ask landowners to modify activities on their land except during periods of training. The properties cannot be inhabited by non-Air Force personnel during periods of training.
- The 347 RQG will conduct HLZ/DZ “high and low” surveys to identify any hazards (e.g., wires, houses, trees, stumps) and specify no-fly zones.
- Aircraft fly-ins to HLZs/DZs occur into the wind when possible, meaning that heading is variable where not limited by obstructions.
- No-fly zones and noise abatement areas are established in current training areas, and new no-fly zones or noise abatement areas may be required at new HLZs/DZs.
- Land uses at HLZs/DZs change with changing commodity prices; however, land use is expected to be fixed as of the lease agreement, and some area use may be restricted
- Flight path and/or mission scheduling may be required to avoid potential damage to crops, etc.
- Landowners and nearby residences would be notified of an LFE at least 24 hours prior to use. Specific guidance would be included in the land use agreement.
- Landowners would coordinate other uses (i.e., hunting activities) on/nearby the HLZs/DZs to avoid recreational use conflicts.
- Per existing consultation agreements with the United States Fish and Wildlife Service (USFWS), wood stork rookeries and bald eagle nests would be avoided by one lateral mile.
- All litter and refuse would be cleaned up after each use.
- No bivouacking, digging, or other land disturbances or improvements at the HLZs/DZs would occur as part of the Proposed Action except for routine maintenance (i.e., brush-cutting/mowing) as described below.
- Military vehicles, inflatable threats, and threat emitters would not be placed in locations that would block roadways.

Annual maintenance of the HLZ/DZ sites may be required, such as periodic mowing and brush cutting, to maintain the sites in low vegetative state to allow safe use by personnel, especially for jump operations. Any maintenance actions would be a condition of the lease agreement.

The five proposed HLZ/DZ locations are described in detail in the sections below.

2.1.1 L2-A Helicopter Landing Zone

The L2-A HLZ is an approximately one-acre parcel located 0.25 miles south of the Georgia border, and 7.5 miles southeast of the town of Fargo. The parcel lies 47 miles southeast of the base. The area has been recently maintained, with ground cover consisting of low grass and shrubs. Adjacent parcels to the north, south, and west contain young pine trees of approximately ten feet in height. A wooden hunting blind is located along the northwest border, facing a 30 gallon hanging deer feeder found in the south corner (Photos 1 and 2). The L2-A HLZ is shown in **Figure 2-1**.

Photo 1: L2-A HLZ Deer Blind (looking north)

Photo 2: L2-A HLZ Deer Feeder (looking south)

2.1.2 L4-3 Helicopter Landing Zone

The L4-3 HLZ is an approximately one-acre parcel located 9.5 miles southwest of the town of Pearson, and 20 miles northeast of Moody AFB. The parcel is bisected by Atkinson County Road 31 0.8 miles north of Springhead Church Road. Ground cover consists of shrubs and grass from 2 to 8 feet (Photos 3 and 4). Surrounding trees in adjacent parcels are of uniform height and approximately 30 feet tall. The L4-3 HLZ is shown in **Figure 2-2**.

Photo 3: L4-3 HLZ (looking east)

Photo 4: L4-3 HLZ (looking west)

Figure 2-1: L2-A HLZ

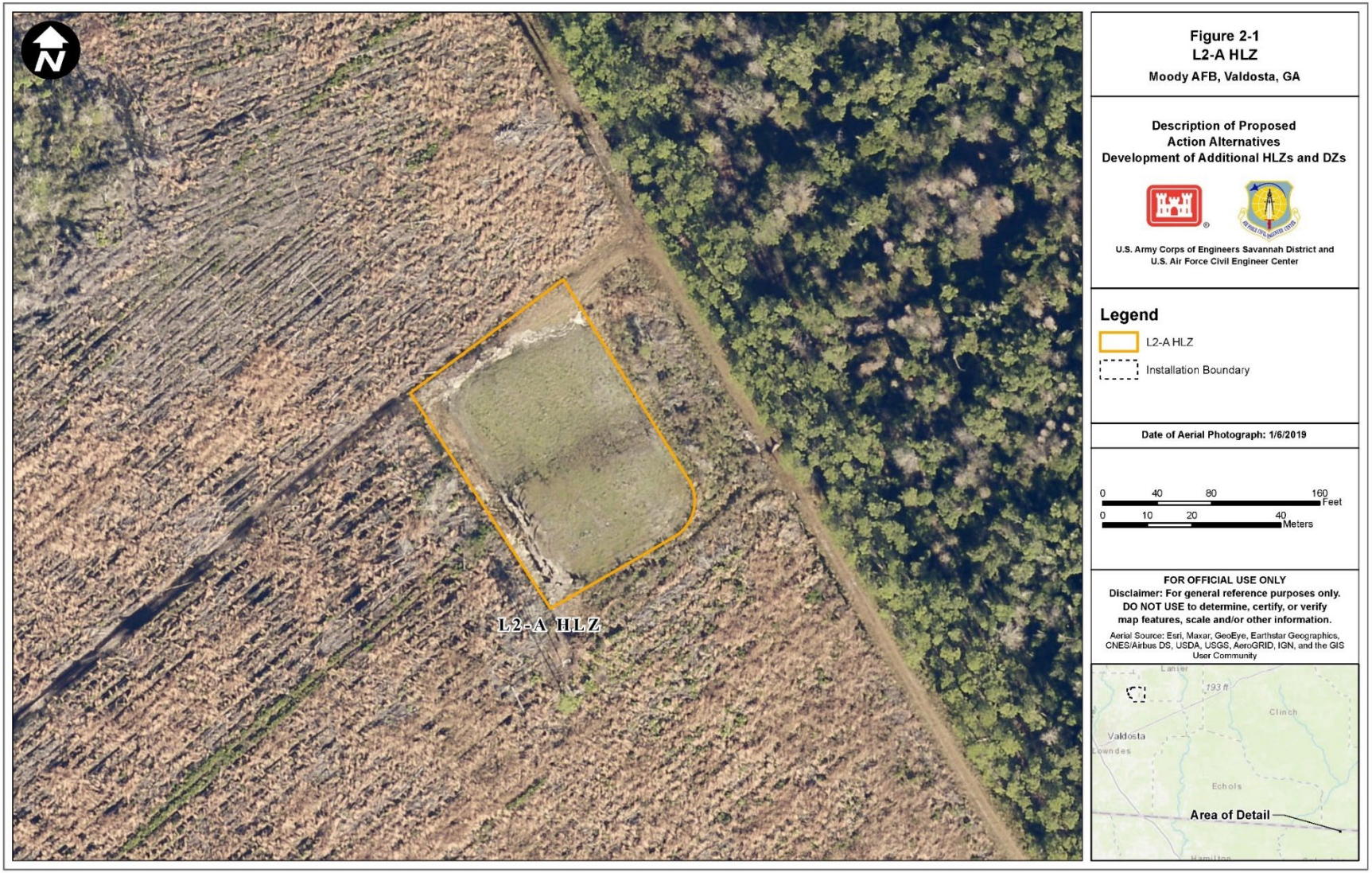


Figure 2-2: L4-3 HLZ

2.1.3 Helicopter Landing Zone 11

The HLZ 11 is an approximately one-acre parcel located 9.5 miles southwest of the town of Pearson, and 26 miles southeast of Moody AFB. The parcel is located 2.3 miles north of State Route 94 along Ford Road. Ground cover consists of shrubs and grass from one to five feet tall. Surrounding trees in adjacent parcels range from 10 to 35 feet tall (Photo 5). The parcel is mostly clear and appears to be maintained. Two tree-mounted hunting blinds are located in the south corner facing a hanging deer feeder found along the northwestern border (Photo 6). HLZ 11 is shown in **Figure 2-3**.

Photo 5: HLZ 11 (looking north)

Photo 6: HLZ 11 Deer Blind (looking south)

2.1.4 L3-2 Drop Zone

The L3-2 DZ is an approximately 83-acre parcel located 15 miles southwest of the town of Homerville, and 20 miles southeast of Moody AFB. The parcel is located 1.6 miles north of Georgia State Route 187 along an unnamed access road. L3-2 is bordered to the north, east, and south by trees of uniform height which are approximately 30 feet tall (Photo 7). Two undisturbed islands of foliage are located within the DZ; a 4.5-acre parcel in the southeastern corner, and an 0.3-acre island along the north-central border. Both have been designated as freshwater forested/shrub wetland by the National Wetlands Inventory. A wooden hunting blind is located on the eastern section of the site anchored to an approximately 25-foot-tall tree (Photo 8). The L3-2 DZ is shown in **Figure 2-4**. Note, **Figure 2-4** is an aerial photograph taken in 2019 and does not

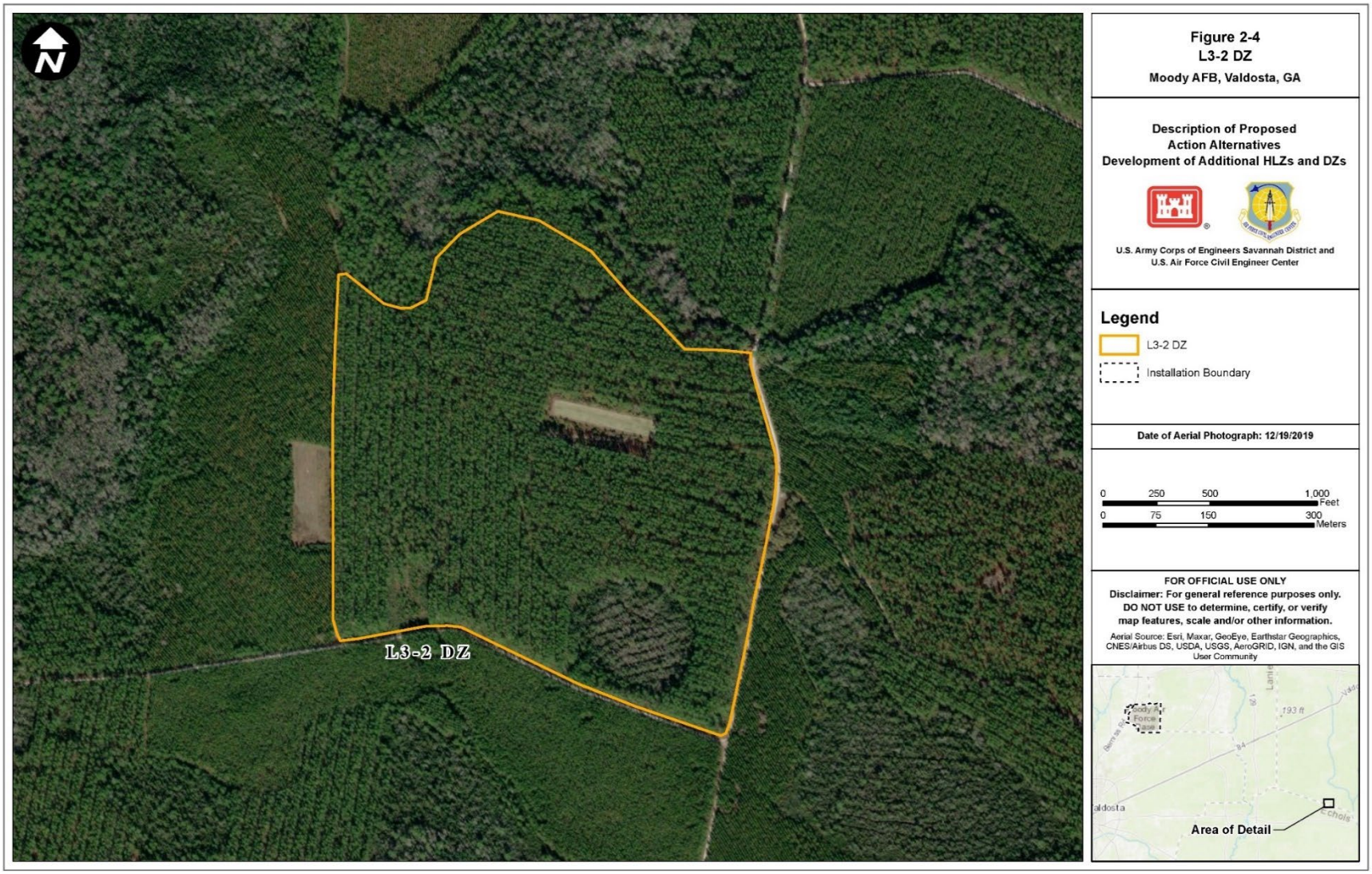
Photo 7: L3-2 DZ (looking north)

Photo 8: L3-2 DZ (looking east)

depict current site conditions. All trees within the 75.8 DZ boundary were harvested after the aerial photograph was taken.

Figure 2-3: HLZ 11

Figure 2-4: L3-2 DZ



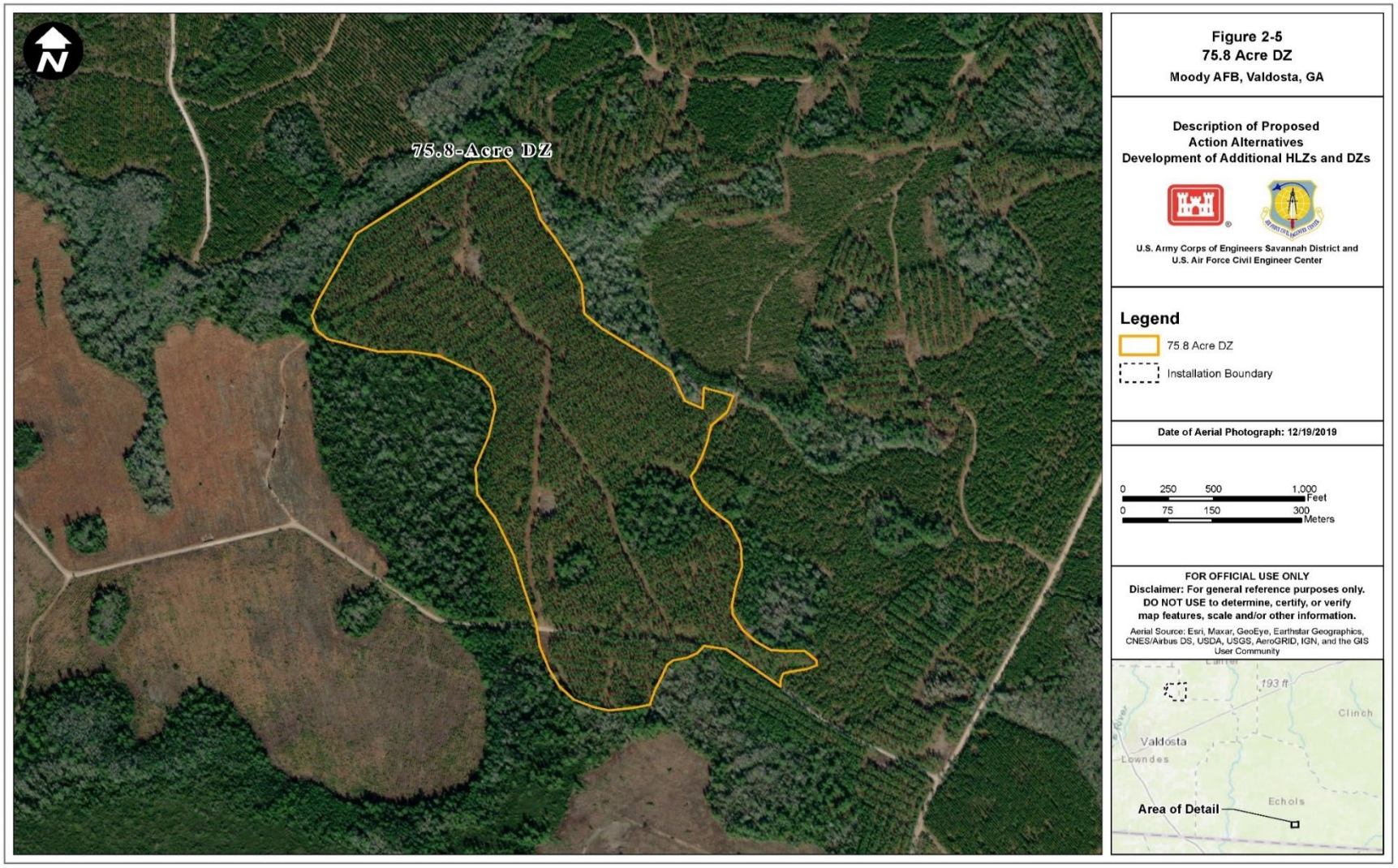
2.1.5 75.8 Drop Zone

The 75.8 DZ is an approximately 76-acre, hourglass-shaped parcel located 27 miles southwest of the town of Homerville, Georgia, and 29 miles southeast of Moody AFB. The parcel is located 1.5 miles south of Georgia State Route 94 along Sandy Ford Road. An access road running north-south transects the site, passing by several slash piles from previous logging activity (Photos 9 and 10). The majority of the site contains small grasses and shrubs between two and six feet in height. Three undisturbed islands of foliage exist throughout the site, which have been designated as freshwater forested/shrub wetland by the National Wetlands Inventory. Surrounding trees in adjacent parcels are of uniform height and approximately 30 feet tall. The 75.8 DZ is shown in **Figure 2-5**. Note, **Figure 2-5** is an aerial photograph taken in 2019 and does not depict current site conditions. All trees within the 75.8 DZ boundary were harvested after the aerial photograph was taken.

Photo 9: 75.8 DZ Access Road (looking north)

Photo 10: 75.8 DZ (looking south)

Figure 2-5: 75.8 Acre DZ



2.2 SELECTION STANDARDS

The NEPA and the CEQ regulations mandate the consideration of reasonable action alternatives to accomplish the Proposed Action. “Reasonable alternatives” are those that also could be utilized to meet the purpose of and need for the proposed action. Per the requirements of 32 CFR Part 989, the USAF EIAP regulations, selection standards are used to help determine feasibility of each action alternative, including potential facilities requirements and the extent to which each action alternative would fulfill the purpose and need for the Proposed Actions. The following selection standards are used to identify reasonable alternatives for analysis in the EA:

1. Airspace
    - Tall objects in the vicinity of a potential alternative are considered hazardous obstructions to air navigation under Title 14 of the Code of Federal Regulations Part 77. Tall objects or obstructions, such as trees, must not penetrate the imaginary surfaces (3-dimensional planes sloping out and up from all sides and ends of a heliport) surrounding the HLZ/DZ. The potential alternative must not contain obstructions that would violate imaginary surface regulations outlined in 14 CFR Part 77.23, *Imaginary Surfaces for Heliports* (CFR, 2021).
    - A potential alternative must be located in currently established Moody AFB MOAs that allow low altitude aircraft training and drops. If the alternative is not located in current MOAs, a Notice to Air Missions (NOTAM) must be entered through the Federal Aviation Administration’s Special Use Airspace Management System to activate a permanent SUA (NOTAM, 2019).
2. Size
    - A potential alternative must provide sufficient surface area to allow up to two HH-60s to hover and land at the HLZ/DZ.
    - A potential alternative must meet standard drop zone and landing zone size criteria outlined in Air Force Instruction 13-217, *Drop Zone and Landing Zone Operations* (AFI, 2007).
3. Compatibility
    - A potential alternative must not be in a location that would create recreational use conflicts with nearby landowners. Landowners must be able to effectively coordinate land uses (i.e., hunting activities) with the USAF to avoid such conflicts.
    - Wood stork rookeries and bald eagle nests must be avoided by one lateral mile per existing consultation agreements with the US Fish and Wildlife Service.
4. Proximity
    - A potential alternative must minimize delays to training associated with aircraft travel to and from the Moody AFB airfield to the HLZ/DZ.
5. Accessibility
    - A potential alternative must be in a location where severe weather conditions would not substantially disrupt training activities.

- A potential alternative must allow for ground vehicle access to the site for the purpose of simulated survivor and inflatable threat placement during LFE training exercises.

6. Safety
    - A potential alternative must meet foreign object debris safety standards and be located near emergency services.
    - Military ground vehicles or inflatable threats utilized in LFEs must be placed in locations that would not block roadways. The surface area of potential alternatives must accommodate usage of such vehicles whereas to not create unsafe or crowded conditions.

2.3 SCREENING OF ALTERNATIVES

The following potential alternatives that might meet the purpose and need for the selection of HLZs and DZs were considered:

- Alternative 1: Action Alternative - Under the action alternative, the proposed action HLZ and DZ properties would be used as training areas by Moody AFB. The L2-A HLZ, L4-3 HLZ, HLZ 11, L3-2 DZ, and 75.8 DZ parcels would be leased from their respective property owners.
- No-Action Alternative - None of the proposed action HLZ and DZ sites would be leased for usage by Moody AFB. The properties would remain in possession of their respective owners.

The selection standards described in **Section 2.2** were applied to these alternatives to determine which alternative(s) could meet the HLZ/DZ requirements and would fulfill the purpose and need for the action.

2.4 DETAILED DESCRIPTION OF THE ALTERNATIVES

The USAF has identified two alternatives that may meet requirements for the proposed action: the Action Alternative and No-Action Alternative. The following sections provide descriptions of the two alternatives.

2.4.1 Alternative 1: Action Alternative

The proposed action would lease up to five parcels for use as HLZs and DZs for Moody AFB aircraft and personnel training operations. The Air Force would notify parcel landowners of intent to lease and begin correspondence with nearby residences to communicate the intended uses. Site development would be limited to the clearing of vegetation and debris. Daily training sorties would involve HH-60 hovering and pattern work as part of personnel recovery exercises. Larger monthly LFEs would begin involving HH-60s, C-130s, and A-10s, as well as simulated ground troops and vehicles.

Should a parcel not meet selection standards or be determined unavailable due to landowner lack of interest, that parcel would be removed from consideration for use as an HLZ or DZ.

2.4.2 No Action Alternative

The Air Force Environmental Impact Analysis Process codified at 32 CFR Part 989.8 requires consideration of the No-Action Alternative. In addition, the CEQ recommends inclusion of the No-Action Alternative in NEPA documents to assess any environmental consequences that may occur if the Proposed Action is not implemented. The No-Action Alternative provides the environmental baseline against which the proposed action and the Action Alternative can be evaluated.

Under the No-Action Alternative, the Air Force would not enter into agreements with the property owners to lease the proposed parcels. None of the currently proposed parcels would be utilized for the training exercises outlined in **Section 1.2**. The Air Force would continue to experience scheduling conflicts and lack of space in current HLZ/DZ areas. Training proficiency and currency would continue to be lost, increasing man hour costs over time.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The proposed HLZs/DZs were initially identified by the 347 RQG via a screening process through flyovers of the areas surrounding Moody AFB and subsequent ground visits of potential sites. HLZ/DZ selection criteria included close proximity to Moody AFB, area size sufficient to allow for training, area topography (relatively flat with no apparent wetlands), no structures (i.e., homes) and obstructions (towers, trees, power lines, etc.), the apparent availability and compatible land use, and whether landowners were amenable to use by the military under lease agreements. Several alternate locations were identified by the 347 RQG as potential HLZs/DZs based on desired geographic and physical attributes. However, after Moody AFB contacted the various land owners to gauge their interest and land availability, it was determined that these alternate locations were not available due to landowner lack of interest. Therefore, although the alternate locations met some or most of the desired selection criteria, they were not carried forward for evaluation due to their lack of availability to Moody AFB. Additional sites were precluded because ground visits indicated they did not meet the selection screening criteria for use as HLZs or DZs. Consequently, only the proposed HLZ/DZ alternatives in this EA were carried forward for evaluation due to their suitability, availability, and meeting all selection criteria.

3.0 AFFECTED ENVIRONMENT

The Region of Influence (ROI) for the Proposed Action includes the individual HLZs and DZs and their flight paths from Moody AFB, Georgia, unless otherwise specified below for a particular resource area where a resource would have a different ROI.

3.1 SCOPE OF THE ANALYSIS

This chapter describes the current conditions of the environmental resources, either man-made or natural, that would be affected by implementing the Alternative 1 or the No Action Alternative.

3.2 NOISE

3.2.1 Definition of the Resource

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as unwanted sound or, more specifically, as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying (Federal Interagency Committee on Noise 1992). Human response to noise can vary according to the type and characteristics of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day.

Due to the wide range in sound levels, sound is expressed in decibels (dB), a unit of measure based on a logarithmic scale. As a general rule, a 3-dB change is necessary for noise increases to be noticeable to humans (Bies and Hansen, 1988). A 10-dB increase in noise level corresponds to a 100% increase (or doubling) in perceived loudness. Sound measurement is further refined by using an A-weighted decibel (dBA) scale that emphasizes the range of sound frequencies that are most audible to the human ear (i.e., between 1,000 and 8,000 cycles per second). Sound frequency is measured in terms of hertz (Hz), and the normal human ear can detect sounds ranging from approximately 20 to 15,000 Hz. However, because all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range, the very high and very low frequencies are adjusted to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurement of community environmental noise. Unless otherwise noted, all decibel measurements presented in the following noise analysis are dBA. Sounds encountered in daily life and their sound levels are provided in **Table 3-1**.

Table 3-1: Common Sounds and Their Levels

Outdoor	Sound Level (dBA)	Indoor
Jet flyover at 1,000 feet	100	Rock band
Gas lawnmower at 3 feet	90	Food blender at 3 feet
Downtown (large city)	80	Garbage disposal
Heavy traffic at 150 feet	70	Vacuum cleaner at 10 feet
Normal conversation	60	Normal speech at 3 feet

Outdoor	Sound Level (dBA)	Indoor
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room

Source: Harris 1998
dBA = A-weighted decibel

These common sounds are typically associated with steady noise levels, although few noises are, in fact, constant; therefore, additional noise metrics have been developed to describe noise including:

- Sound Exposure Level (SEL) - SEL is a measure of the total energy of an acoustic event. It represents the level of a one-second-long constant sound that would generate the same energy as the actual time-varying noise event such as an aircraft overflight. SEL provides a measure of the net effect of a single acoustic event, but it does not directly represent the sound level at any given time.
- Day-Night Sound Level (DNL) - DNL is the average sound energy in a 24-hour period with penalty added to the nighttime levels. Because of the potential to be particularly intrusive, noise events occurring between 10:00 p.m. and 7:00 a.m. are assessed a 10 dB penalty when calculating DNL. DNL is a useful descriptor for aircraft noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. DNL provides a measure of the overall acoustical environment, but as with SEL, it does not directly represent the sound level at any given time.
- Maximum Sound Level (L_{max}) - L_{max} is the maximum sound level of an acoustic event in decibels (e.g., when an aircraft is directly overhead).
- Equivalent Sound Level (L_{eq}) - L_{eq} is the steady-state sound level in decibels averaged over a specified period of time. L_{eq} is equivalent to the DNL without the added nighttime penalty.
- Onset-Adjusted Monthly DNL (DNL_{mr}) is the average sound energy in a 24-hour period with a 10 dB penalty added to the nighttime levels, and up to an additional 11 dB penalty for acoustical events with onset rates greater than 15 dB per second, such as high-speed jets operating near the ground. DNL_{mr} is assessed for the month with the highest number of events, and as with DNL and SEL, it does not directly represent the sound level at any given time. Because of the penalties for rapid onset, DNL_{mr} is always equal to or greater than DNL.
- Percent Highly Annoyed (%HA). The concept of long-term annoyance is used to account for all negative aspects of noise, including activity interference such as speech interference and sleep disturbance for nighttime activities, and is the basis for determining impacts due to aircraft noise associated with military and civilian aircraft operations. DNL and L_{dnmr} are highly correlated with and used to determine the %HA (see **Table 3-2**). It is not possible to accurately predict the exact annoyance responses to aircraft noise exposure in any specific community, and %HA is not designed to be used to determine exactly how many or which individuals may be annoyed by aircraft noise. It is reported as the change in the percent of population expected to be highly annoyed, and individuals or populations identified as highly annoyed are for reference purposes to assist in determining the potential for effects.

Table 3-2: Relationship between Annoyance and Day-Night Sound Level

dBA DNL	% Highly Annoyed
35	0.2%
40	0.4%
45	0.8%
50	1.7%
55	3.3%
60	6.5%
65	12.3%
70	22.1%
75	36.5%
80	53.7%

Source: Air Force 2016

- Peak Level Exceeded Only 15 Percent of the Time (PK 15[met]). The PK 15[met] metric is a peak sound level with no frequency-weighting that is commonly used for banging or clapping noises such as gunfire. How well these noises carry (i.e., propagate) through the atmosphere depends on weather (i.e., meteorological) conditions. On days that are favorable to sound propagation, noise levels received at a certain distance may be much higher than on days less favorable. PK 15[met] accounts for the variability reporting the noise level exceeded on only 15 percent of days.

3.2.2 Regulatory Overview

The Noise Control Act of 1972 directs federal agencies to comply with applicable federal, state, and local noise control regulations. The Noise Control Act specifically exempts both aircraft operations and military training activities from state and local noise ordinances. There are no federal, state, or local noise regulations directly applicable to the area under the airspace potentially affected by the Proposed Action. The Air Force's land use guidelines for noise exposure are outlined in AFI 32-1015, *Integrated Installation Planning*. **Table 3-3** provides a general overview of recommended noise limits from aircraft operations for land use planning purposes. These recommended noise limits are consistent with FAA criteria (FAA, 2015). Detailed guidelines for the compatibility of various land uses with noise exposure levels are included in **Appendix B**.

Table 3-3: Recommended Noise Limits for Land Use Planning

General Level of Noise	Percent Highly Annoyed	Aircraft Noise (DNL)	General Recommended Uses
Low	<13%	< 65 dBA	Noise-sensitive land uses acceptable
Moderate	13%-37%	65-75 dBA	Noise-sensitive land uses normally not recommended
High	>37%	> 75 dBA	Noise-sensitive land uses not recommended

Source: Air Force 2016, FAA 2015
DNL = day-night sound level; dBA = A-weighted decibel

The U.S. Army is the DoD service with the lead role in setting munitions noise policy and has established land use recommendations based on munitions noise levels near training ranges. Army Regulation (AR) 200-1, Environmental Protection and Enhancement, Chapter 14, *Operational Noise* translates noise exposure on communities into Noise Zones. Regulation guidelines state that for land use planning purposes, noise-sensitive land uses range from acceptable to not compatible within the Noise Zones. **Table 3-4** lists the noise limits as shown in Army Regulation (AR) 200-1.

Table 3-4: US Army Noise Limits for Noise Zones

Noise Zone	Noise Limits			Noise-Sensitive Land Use
	Aviation ADNL (dB)	Impulsive CDNL (dB)	Small Arms dB Peak	
LUPZ	60 - 65	57 - 62	n/a	Generally Compatible
I	< 65	< 62	< 87	Generally Compatible
II	65 - 75	62 - 70	87 - 104	Generally Not Compatible
III	> 75	> 70	> 104	Not Compatible

Source: Army 2007
Legend: dB = decibel, ADNL = A-weighted Day-Night Level, CDNL = C-weighted Day-Night Level, LUPZ = Land Use Planning Zone

Average noise levels may be the best tool for long-term land use planning, but they may not adequately assess the probability of community annoyance. As recommended in AR 200-1, supplemental metrics to identify where noise from aviation overflights, demolition activity, and large caliber weapons may periodically reach levels high enough to generate complaints. In many instances, Noise Zones will indicate land use compatibility; however, noise complaints from impulsive noise, often referred to as blast noise, typically are attributable to a specific event rather than annual average noise levels. Peak levels are useful for estimating the risk of receiving a noise complaint from blast noise, as they correlate with the receiver's perception of noise levels. **Table 3-5** lists the Army's Complaint Risk Guidelines.

Table 3-5: Complaint Risk Guidelines (Blast Noise)

Perceptibility	dB Peak	Risk of Receiving Noise Complaints
May be Audible	< 115	Low
Noticeable, Distinct	115 - 130	Moderate
Very Loud, May Startle	> 130	High
*Perceptibility is subjective. The classifications are based on how a typical person might describe the event.		

Source: Army 2007

3.2.3 Existing Conditions

Background noise levels (L_{eq} and DNL) were estimated for the areas below Moody 2 North and Moody 2 South MOAs using the techniques specified in the *American National Standard Institute - Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements* with an observer present (ANSI, 2013). **Table 3-6** outlines the overall sound levels (i.e., DNL) in the areas beneath the Moody 2 North and Moody 2 South MOAs; however, while mostly rural and remote, there are several small towns and villages. These towns would be relatively quiet, and background sound levels without aircraft would not normally exceed 52 dBA L_{eq} in the daytime, or 44 dBA L_{eq} at night (USAF, 2020). Background levels would be less than this in rural areas, and appreciably less in remote areas.

Table 3-6: Estimated Background Sound Levels

Land Use Category	Leq [dBA]		
	DNL [dBA]	Daytime	Nighttime
Normal suburban residential	52	50	44
Quiet suburban residential	47	45	39
Rural residential	42	40	34
Rural/Remote	<42	<40	<34

Source: Air Force 2020; ANSI 2013.

When aircraft training operations are not being conducted in Moody 2 North and Moody 2 South MOAS, the areas surrounding the proposed HLZs/DZs are rural and generally quiet. HLZ L-2A while not within the boundaries of Moody 2 North and Moody 2 South MOAs, is also in area considered rural. Noise levels in a rural setting typically range between 35 and 44 dB (USEPA, 1974). However, during deer hunting season in particular, gunfire is a noticeable part of the sound environment in rural areas.

Overall Aircraft Noise. The MOA Range NOISEMAP **(**MR_NMAP) (v3.0) noise model, part of the Air Force NOISEMAP computer suite, was used to predict noise levels (DNL_{mr}) associated with aircraft operations beneath the existing Moody 2 North and Moody 2 South MOAs where existing 347 RQG HLZ/DZ daily operations occur (USAF, 2016). The parameters considered in

the modeling include aircraft type, airspeed, power settings, aircraft operations, vertical training profiles, and the time spent within each airspace block. MR_NMAP is the Department of Defense (DoD)- and FAA-approved noise model for aircraft operations beneath Special Use Airspace (Moody AFB 2022; FAA 2015). Operational data for the aircraft operations were taken from environmental documentation in support of the Moody Airspace Complex. **Appendix B** contains the operational data for the Moody 2 North and Moody 2 South MOAs input to MR_NMAP.

Table 3-7 outlines the existing overall sound levels (i.e., DNL_{mr}) beneath the Moody 2 North and Moody 2 South MOAs and existing aircraft activities. These aircraft activities include 347 RSQ HLZ/DZ operations (**Table 3-7**).

Table 3-7: Overall Sound Levels and Percent Highly Annoyed - Existing Conditions

Airspace	Overall Sound Level (dBA DNL_{mr})	Percent Highly Annoyed (%)
Moody 2 North MOA	44.2	0.7%
Moody 2 South MOA	43.2	0.6%

Sources: Air Force 2016, Moody AFB 2022.

Individual Overflight Noise. The sole use of DNL and land use compatibility does not fully describe the nature and effects from aircraft noise because they are used for planning purposes and do not consider other effects such as hearing loss, sleep and speech interference, and structural damage. This is particularly true for airspace actions that have medium intensity effects over large geographical areas, as opposed to high intensity effects over a smaller area (e.g., noise near an airport or air installation). Both the Air Force and the FAA encourage the inclusion of supplemental noise metrics in the assessment of noise from airspace actions (USAF, 2016; FAA, 2015). MR_NMAP was also used to calculate L_{max} and SEL for individual overflights.

Although operational noise levels are often too low to result in incompatibility with existing land uses, noise from individual overflights generate distinct acoustical events. **Table 3-8** outlines the L_{max} and SEL for existing individual aircraft overflights for the primary and secondary users of the existing Moody 2 North and Moody 2 South MOAs. Typical overflights in the lower-altitude portions of the existing Moody 2 North MOA and Moody 2 South MOA are clearly audible and sometimes loud to individuals on the ground. These overflights are brief, intermittent, distributed though the MOAs, and normally do not occur repeatedly at any one location over a short duration. Individual overflights would be neither loud enough nor frequent enough to highly annoy an appreciable percentage of the population or to generate areas of incompatible land use underneath Moody 2 North and Moody 2 South MOAs.

Table 3-8: Sound Levels for Individual Overflights

Altitude (feet)	Primary Aircraft (Typical Overflights)							
	L_{max} (dBA)[a]				SEL (dBA)[b]			
	A-29	A-10	H-60	C-130	A-29	A-10	H-60	C-130
500[c]	**82.7**	**96.0**	**84.2**	**91.5**	84.6	94.5	90.5	96.2
1,000	**75.5**	**87.8**	**77.5**	**84.4**	79.2	88.1	85.6	90.9
2,000	68.0	**77.7**	70.3	**76.7**	73.6	79.8	80.2	85.0
4,000	60.2	64.2	62.3	68.3	67.5	68.1	74.0	78.4
8,000	51.5	48.4	53.1	59.1	60.6	54.0	66.6	71.1
23,000	37.8	34.7	38.1	45.7	49.3	42.7	54.0	60.0

Source: Air Force, 2020

Notes: [a] Lmax is the maximum sound level during an individual overflight. Overflights that exceed 75 dBA Lmax (bolded values) could interfere with speech. [b] SEL is the sound level if the entire overflight was compressed into one second and does not represent the actual noise at any given time. [c] Noise model does not provide an output for sound levels of individual overflights at an altitude of 100 feet AGL.

dBA - A-weighted decibel; L_{max} - maximum sound level; SEL - sound exposure level

3.3 AIR QUALITY

3.3.1 Definition of the Resource

3.3.1.1 Ambient Air Quality Standards

Section 108 of the Clean Air Act (CAA) requires that the USEPA establish National Ambient Air Quality Standards (NAAQS) for six common air pollutants (known as criteria air pollutants): carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), Ozone (O_3), sulfur dioxide (SO_2), and particulate matter, which includes particulate matter with a diameter less than or equal to 2.5 micrometers ($PM_{2.5}$) and particulate matter with a diameter less than or equal to 10 micrometers (PM_{10}). The NAAQS are standards to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly, as well as to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Because different pollutants have different effects, the NAAQS are also different. Some pollutants have standards for both long-term and short-term averaging times. Short-term NAAQS (1-, 8-, and 24-hour averages) have been established for pollutants contributing to acute, or short-term, health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. Each state has the authority to adopt standards that are more stringent than those established under the federal program. **Table 3-9** provides the ambient air quality standards set forth by the Georgia Air Protection Branch.

Table 3-9: Ambient Air Quality Standards [1]

Criteria Pollutant	Averaging Time	Level [2]	Form
SO_2	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	3 hours	0.5 ppm	Not to be exceeded more than once per year
PM_{10}	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	Annual	12.0 µg/m^3	Annual mean, averaged over 3 years
CO	1 hour	35 ppm	Not to be exceeded more than once per year
	8 hours	9 ppm	
O_3	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Pb	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
NO_2	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Annual	53 ppb	Annual mean

[1] Georgia Rule 391-3-1.02(4).

[2] ppb = parts per billion
ppm = parts per million
µg/m^3 = micrograms per cubic meter

3.3.1.2 Greenhouse Gases and Climate Change

CEQ's *Final Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change* [Aug 2016] provides guidance regarding NEPA air quality assessments. This document recommends that agencies quantify a proposed action's projected direct and indirect Greenhouse gas (GHG) emissions. GHG emission estimates have been prepared using the Air Conformity Applicability Model (ACAM).

Section 6.3.1 of the EIAP Guide does not establish a quantity of GHG emissions as significant relating to impacts to the environment but does imply methods (e.g., the use of ACAM) to establish significance indicators. Indicators are United States Environmental Agency (USEPA) thresholds applied out of context to their intended use that do not provide definitive impact determination but rather evidence to the potential significance of GHG emissions on air quality. The USEPA has established a requirement for GHG emissions to undergo a Best Available Control Technology (BACT) analysis under the Prevention of Significant Deterioration (PSD) permit program. If a permitting project would emit or has the potential to emit 75,000 short tons (2,000 pounds per short ton) per year of carbon dioxide equivalents (CO_{2e}), and would otherwise be subject to the PSD requirements, then a BACT analysis must be performed on the GHG emissions. This value was used as the significance indicator for the proposed actions included in this EA.

In addition, the effects of climate change on the proposed action`s and/or the environment (per Section 6.4 of the Air Quality EIAP Guide) should be included to address and document that an informed decision-making process was followed. For smaller projects [i.e., actions generating less than 75,000 short tons per year CO_{2e}], discussion of two subjective qualitative assessments should be minimal, where the two subjective assessments are:

1. Impact of climate change on the proposed action; and
2. Impact of climate change on the environmental impacts of the proposed action.

Therefore, based on the two CEQ requirements and the suggested discussion related to the effects of climate change, the air emissions associated with each proposed action are calculated by the ACAM. The results are described in **Section 4.2,** Air Quality.

3.3.2 Existing Conditions

Moody AFB is located within Lowndes County, under the jurisdiction of Georgia DNR-EPD, which publishes statewide air quality and permitting regulations. Lowndes County is currently designated by the USEPA as an *attainment* area for CO, SO_2, NO_2, O_3, particulate matter (PM_{10} and $PM_{2.5}$), and Pb (USEPA 2022).

3.3.2.1 L2-A HLZ

This site is in Columbia County, Florida, under the jurisdiction of Florida Department of Environmental Protection, Division of Air Resource Management, which publishes statewide air quality and permitting regulations. Columbia County is currently designated by the USEPA as an *attainment* area for CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb (USEPA, 2022). No stationary sources of air emissions are currently present at the site and mobile sources of air emissions are limited to periodic timber harvesting activities.

3.3.2.2 L4-3 HLZ

This site is in Atkinson County, Georgia. Atkinson County is currently designated by the USEPA as an *attainment* area for CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb (USEPA, 2022). No stationary sources of air emissions are currently present at the site and mobile sources of air emissions are limited to periodic timber harvesting activities.

3.3.2.3 HLZ 11

This site is in Echols County, Georgia. Echols County is currently designated by the USEPA as an *attainment* area for CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb (USEPA, 2022). No stationary sources of air emissions are currently present at the site and mobile sources of air emissions are limited to periodic timber harvesting activities.

3.3.2.4 L3-2 DZ

This site is in Clinch County, Georgia. Clinch County is currently designated by the USEPA as an *attainment* area for CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb (USEPA, 2022). No stationary sources

of air emissions are currently present at the site and mobile sources of air emissions are limited to periodic timber harvesting activities.

3.3.2.5 75.8 Acre DZ

This site is in Echols County, Georgia. Echols County is currently designated by the USEPA as an *attainment* area for CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb (USEPA, 2022). No stationary sources of air emissions are currently present at the site and mobile sources of air emissions are limited to periodic timber harvesting activities.

3.4 WATER RESOURCES

3.4.1 Surface Waters and Water Quality

3.4.1.1 Definition of the Resource

Surface water resources comprise lakes, rivers, and streams and are important for ecological, economic, recreational, aesthetic, and human health reasons. Waters of the U.S. are protected by the Clean Water Act and include wetlands and streams that meet certain criteria as defined in 80 Federal Register 37054 and subsequent regulations. Surface water features in the vicinity of the sites consist of wetlands, ponds, lakes, and perennial and intermittent streams. **Figures 3-1** through **3-5** illustrates the surface waters within and in close proximity to the proposed sites.

3.4.1.2 Existing Conditions

L2-A HLZ

The Site L2-A topographic map (showing surface water features) is shown on **Figure 3-1**. No streams, ponds, or lakes are shown in the project vicinity. Biologists conducted a site reconnaissance in December 2021 and did not identify any potential waters within the site area, but mapping shows potential wetlands located east of and on the opposite side of the access road. Potential wetland areas within or near the site are described in **Section 3.4.3.1** on wetlands, below.

L4-3 HLZ

The Site L4-3 topographic map (showing surface water features) is shown on **Figure 3-2**. No streams, ponds, or lakes are shown in the project vicinity. Biologists conducted a site reconnaissance in December 2021 and did not identify any potential waters within or adjacent to the site area. Potential wetland areas within or near the site are described in **Section 3.4.3.1** on wetlands, below.

HLZ 11

The Site HLZ 11 topographic map (showing surface water features) is shown on **Figure 3-3**. No streams, ponds, or lakes are shown in the project vicinity. Biologists conducted a site reconnaissance in December 2021 and did not identify any potential waters within the site area, but mapping shows potential wetlands located 100 feet northwest of the site. Potential wetland areas within or near the site are described in **Section 3.4.3.1** on wetlands, below.

L3-2 DZ

The Site L3-2 topographic map (showing surface water features) is shown on **Figure 3-4**. No streams, ponds, or lakes are shown in the project vicinity, but mapping shows potential wetlands located in the southeast corner of the property. Biologists conducted a site reconnaissance in December 2021 and identified potential wetland areas within the site and a perennial stream with adjacent wetlands approximately 100 feet northeast of the northern property boundary. Potential wetland areas within or near the site are described in **Section 3.4.3.1** on wetlands, below.

75.8 Acre DZ

The Site 75.8 DZ topographic map (showing surface water features) is shown on **Figure 3-5**. No streams, ponds, or lakes are shown in the project vicinity, but mapping shows potential wetlands located both within the site and along the western, northeastern, and southeastern property boundaries. Biologists conducted a site reconnaissance in December 2021 and identified potential wetland areas within the site. Potential wetland areas within or near the site are described in **Section 3.4.3.1** on wetlands, below.

Figure 3-1: Topographic Map L2-A

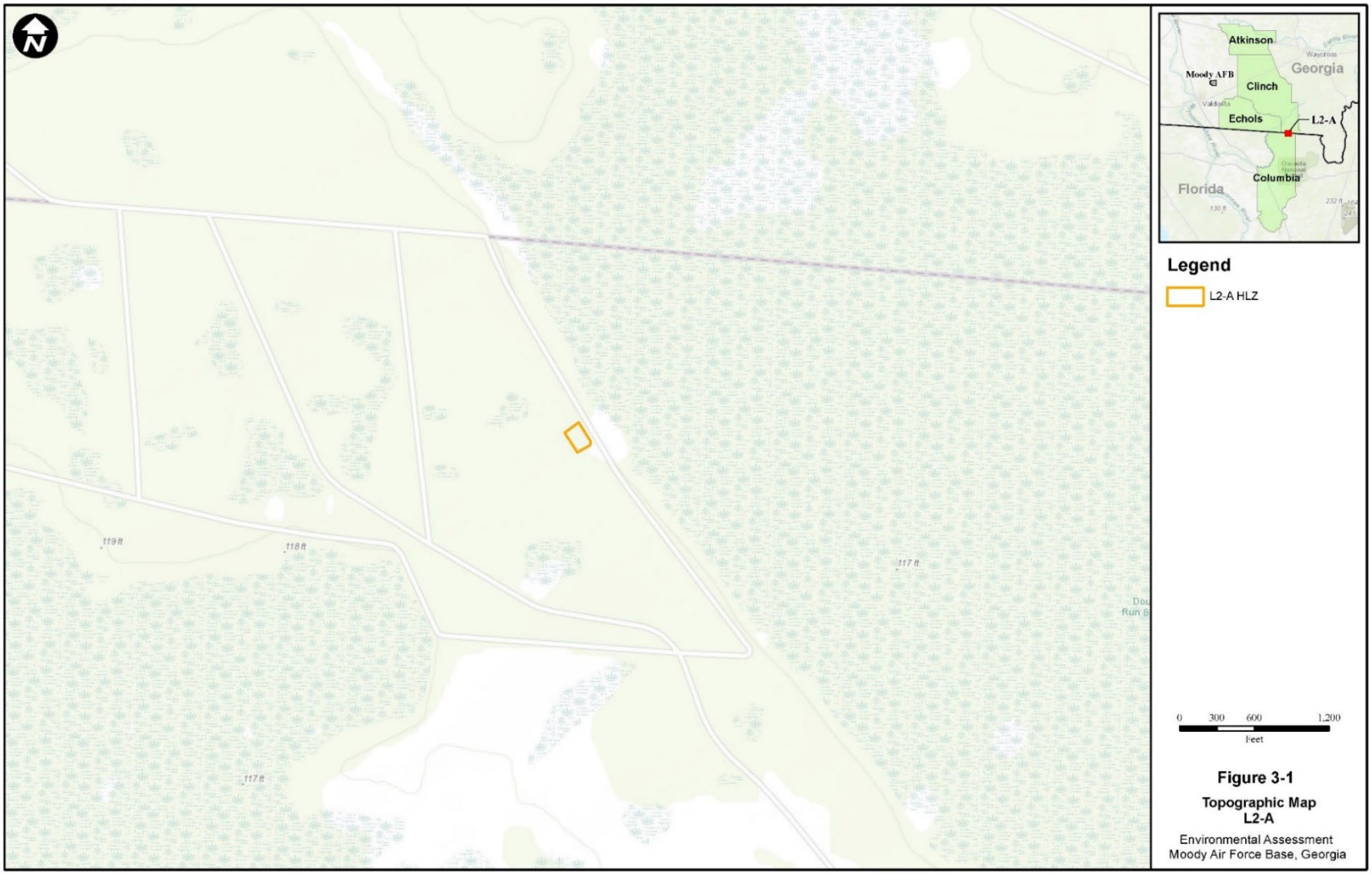


Figure 3-2: Topographic Map L4-3

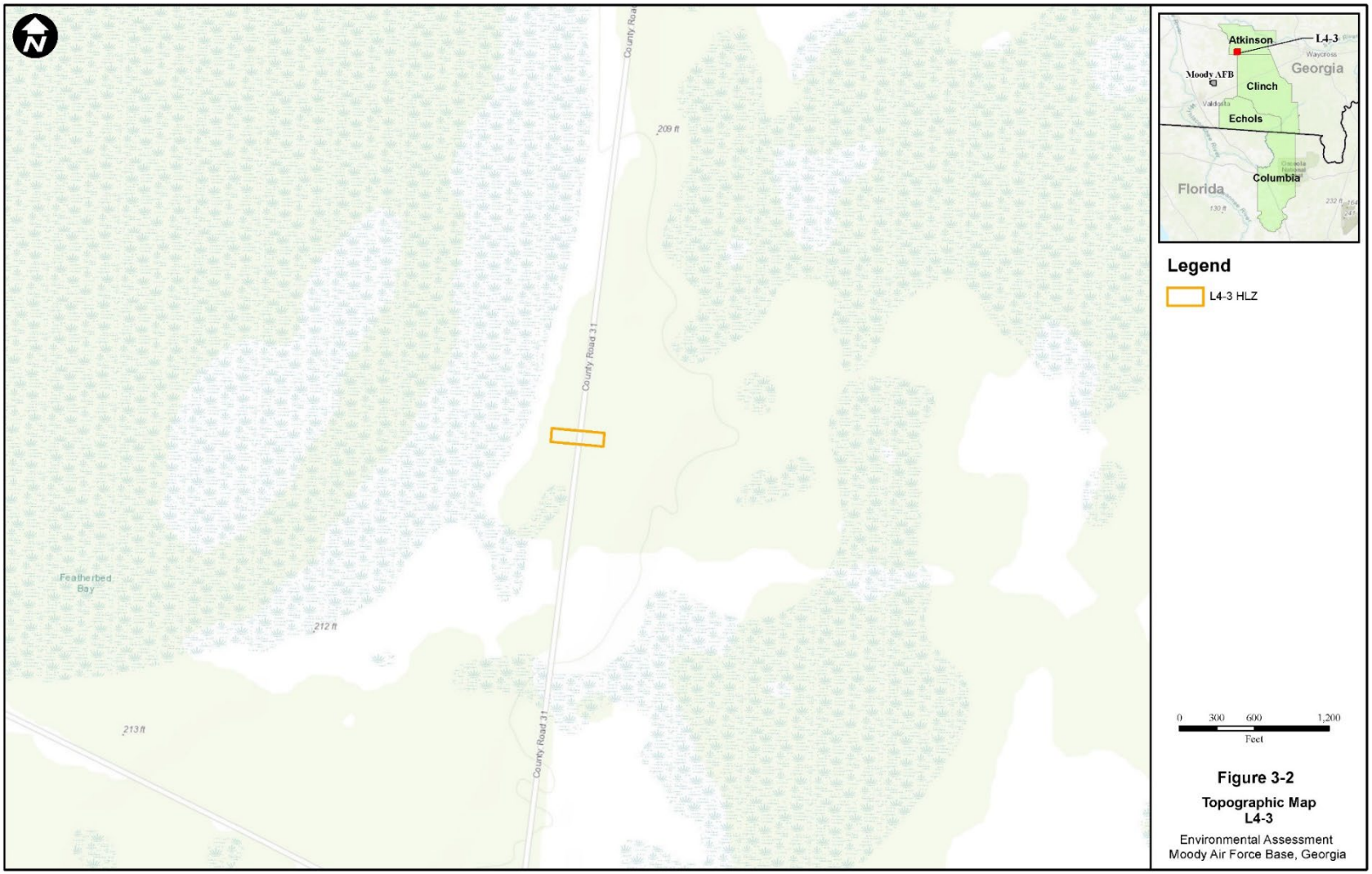


Figure 3-3: Topographic Map HLZ 11

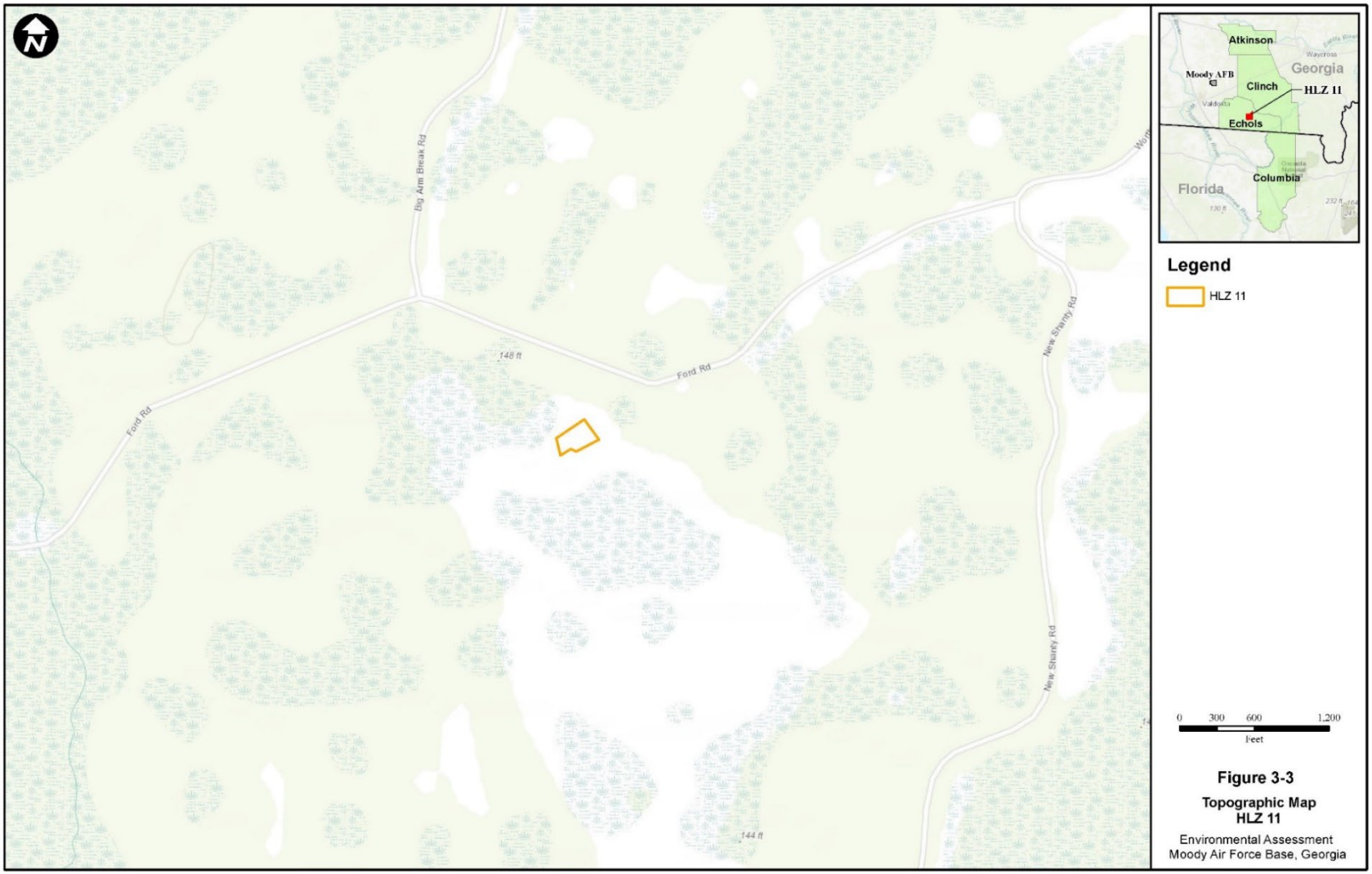


Figure 3-4: Topographic Map L3-2

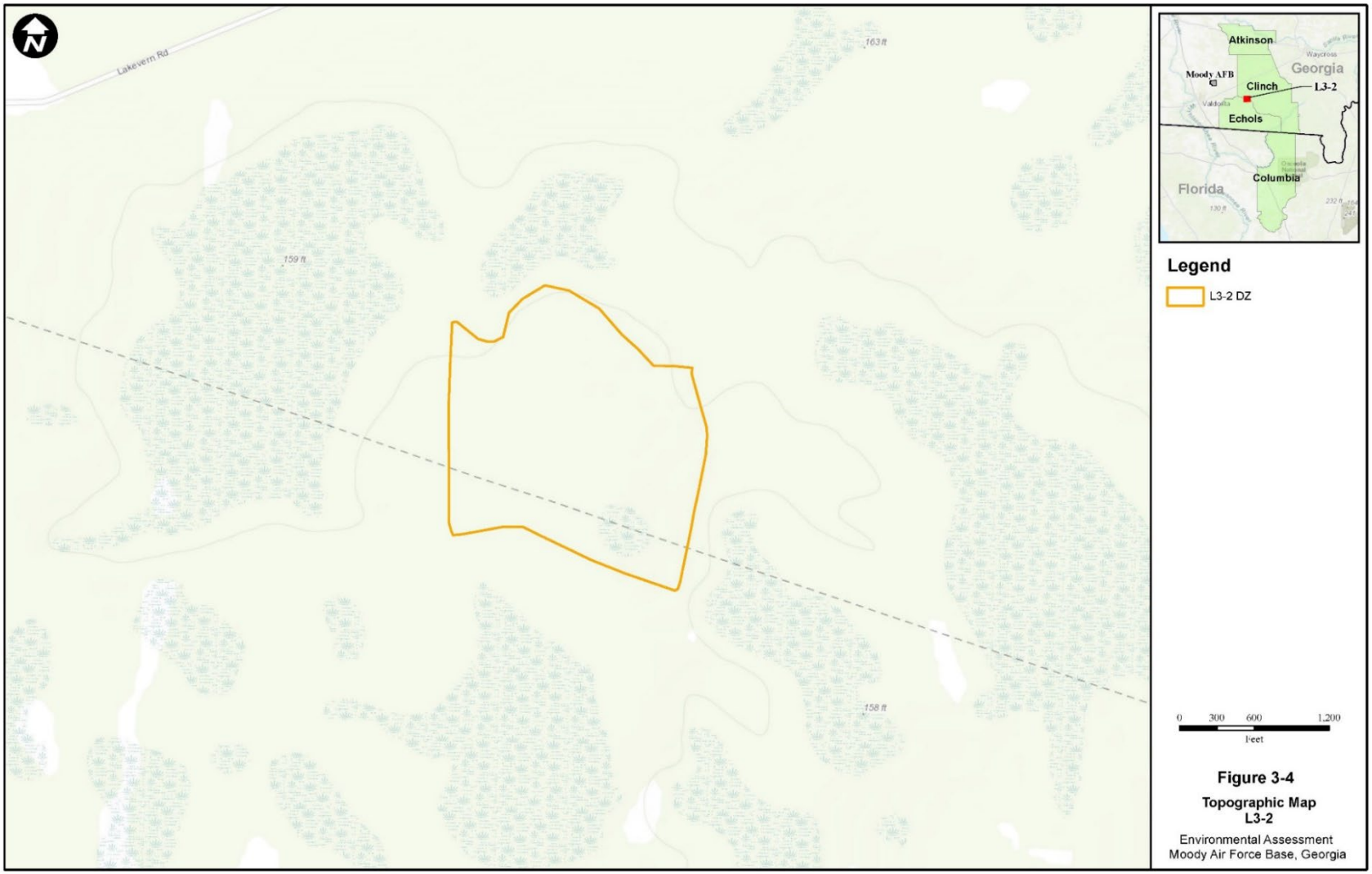
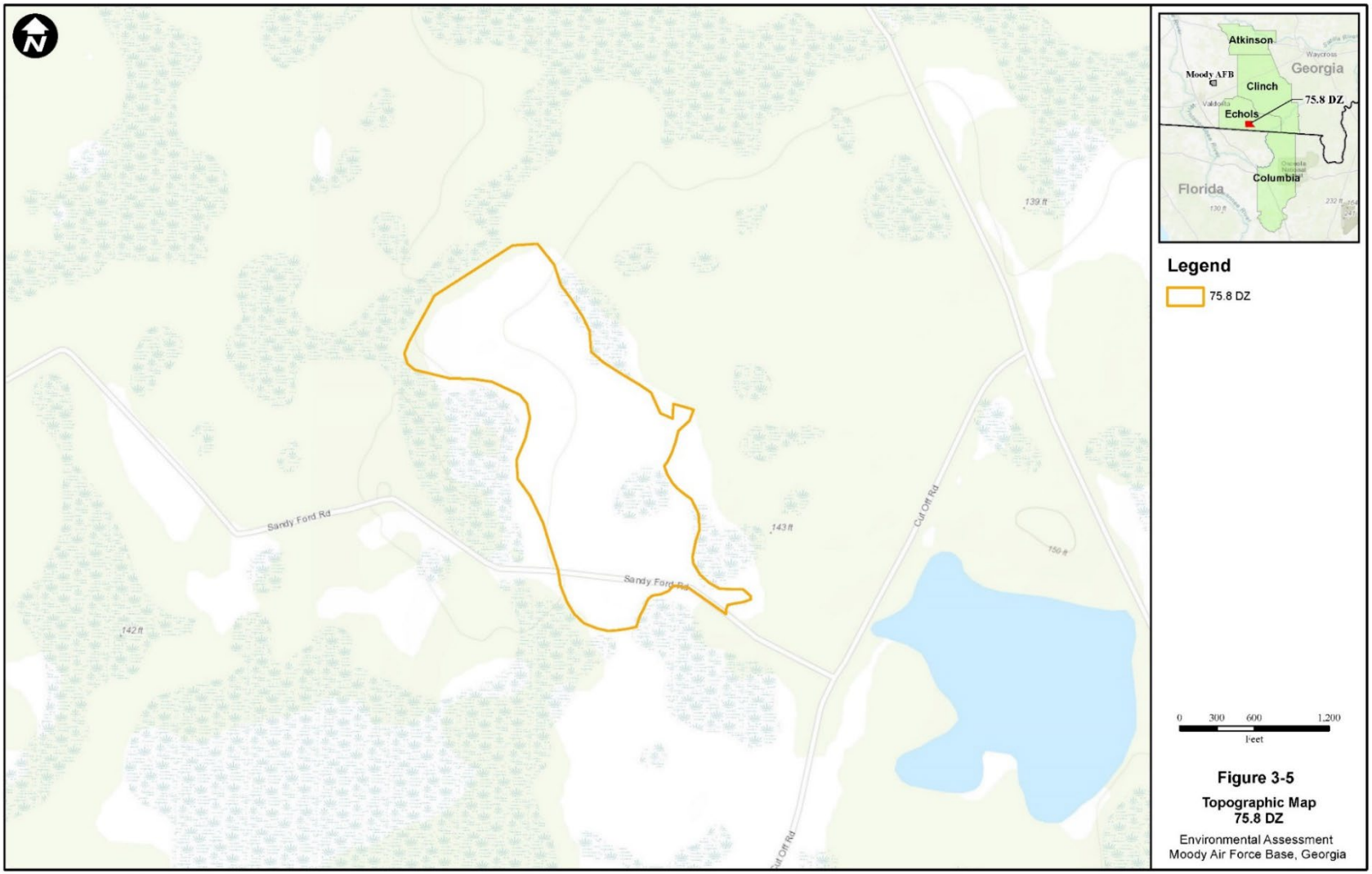


Figure 3-5: Topographic Map 75.8 DZ



3.4.2 Floodplains

3.4.2.1 Definition of the Resource

Floodplains, as defined by the Federal Emergency Management Agency (FEMA), are those areas that are susceptible to being inundated by floodwaters from any source. Flooding potential is evaluated by FEMA, which defines 100-year floodplains as areas having a 1 percent chance of inundation by a flood event in a given year. Executive Order 11988, Floodplain Management, requires federal agencies to determine whether a proposed action would occur within a floodplain and directs federal agencies to avoid floodplains to the maximum extent possible wherever there is a practicable alternative. The Proposed Action does not include any construction, addition of impervious services, or other actions that would adversely affect floodplains, so a FONPA is not required.

A review of the FEMA National Flood Insurance Program Flood Insurance Rate Map indicates that portions of the Proposed Action areas are located within designated 100-year floodplains. **Figures 3-6** through **3-10** illustrates designated floodplain areas within and in close proximity to the proposed sites.

3.4.2.2 Existing Conditions

L2-A HLZ

Floodplains in the vicinity of Site L2-A are shown on **Figure 3-6**. No designated 100-year floodplain areas are located within the site.

L4-3 HLZ

Floodplains in the vicinity of Site L4-3 are shown on **Figure 3-7**. No designated 100-year floodplain areas are located within the site.

HLZ 11

Floodplains in the vicinity of Site HLZ 11 are shown on **Figure 3-8**. Over half of the site is located within the designated 100-year floodplain associated with Toms Creek/Simmons Bay. Toms Creek is located approximately 4,500 feet west of the site.

L3-2 DZ

Floodplains in the vicinity of Site L3-2 are shown on **Figure 3-9**. No designated 100-year floodplain areas are located within the site.

75.8 Acre DZ

Floodplains in the vicinity of Site 75.8 DZ are shown on **Figure 3-10**. Approximately half of the site is located within the designated 100-year floodplain associated with Toms Creek. Toms Creek is located approximately 1.2 miles northeast of the site.

Figure 3-6: FEMA Floodplains L2-A

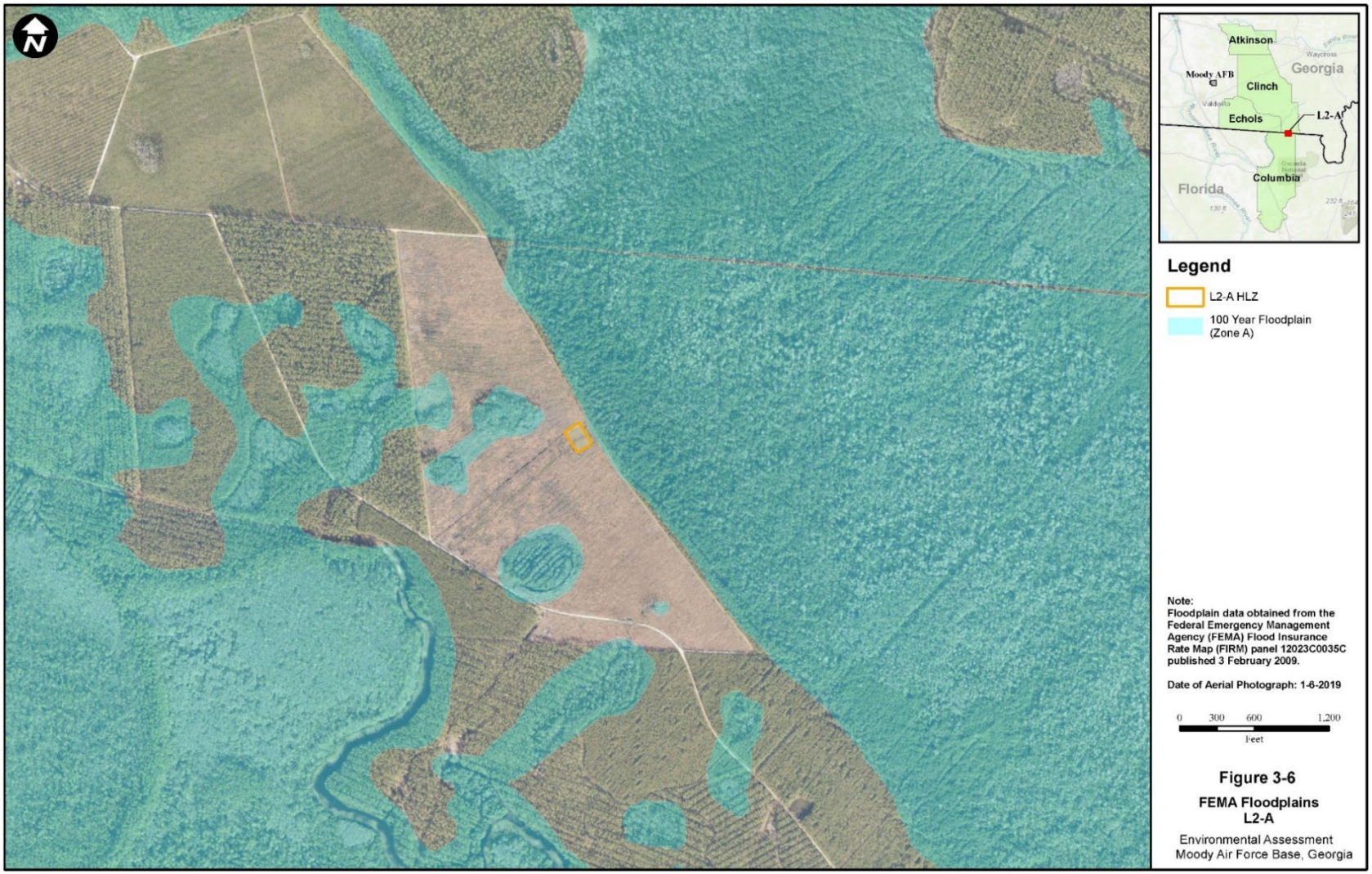


Figure 3-7: FEMA Floodplains L4-3

Figure 3-8: FEMA Floodplains HLZ 11

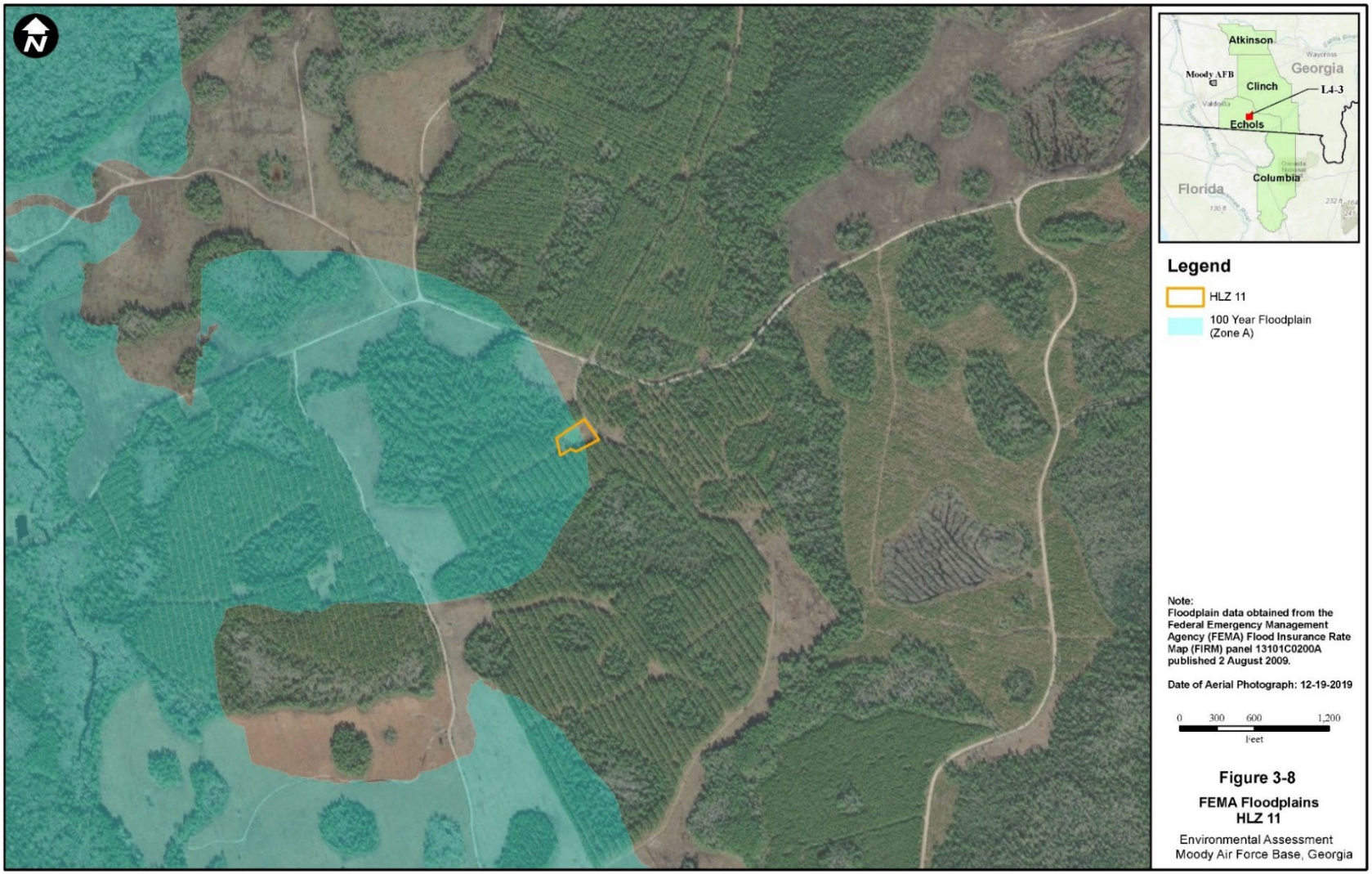


Figure 3-9: FEMA Floodplains L3-2 DZ

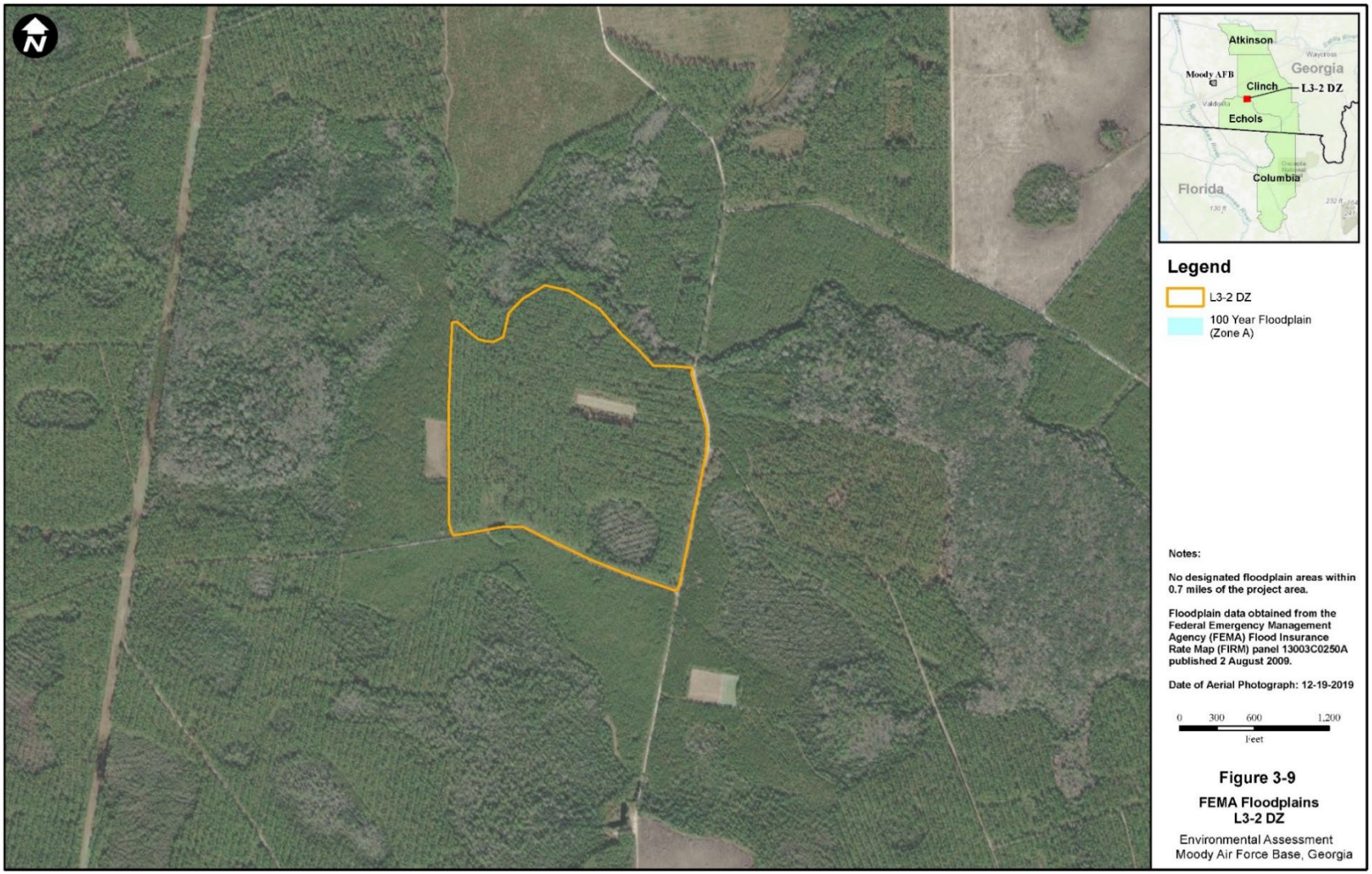
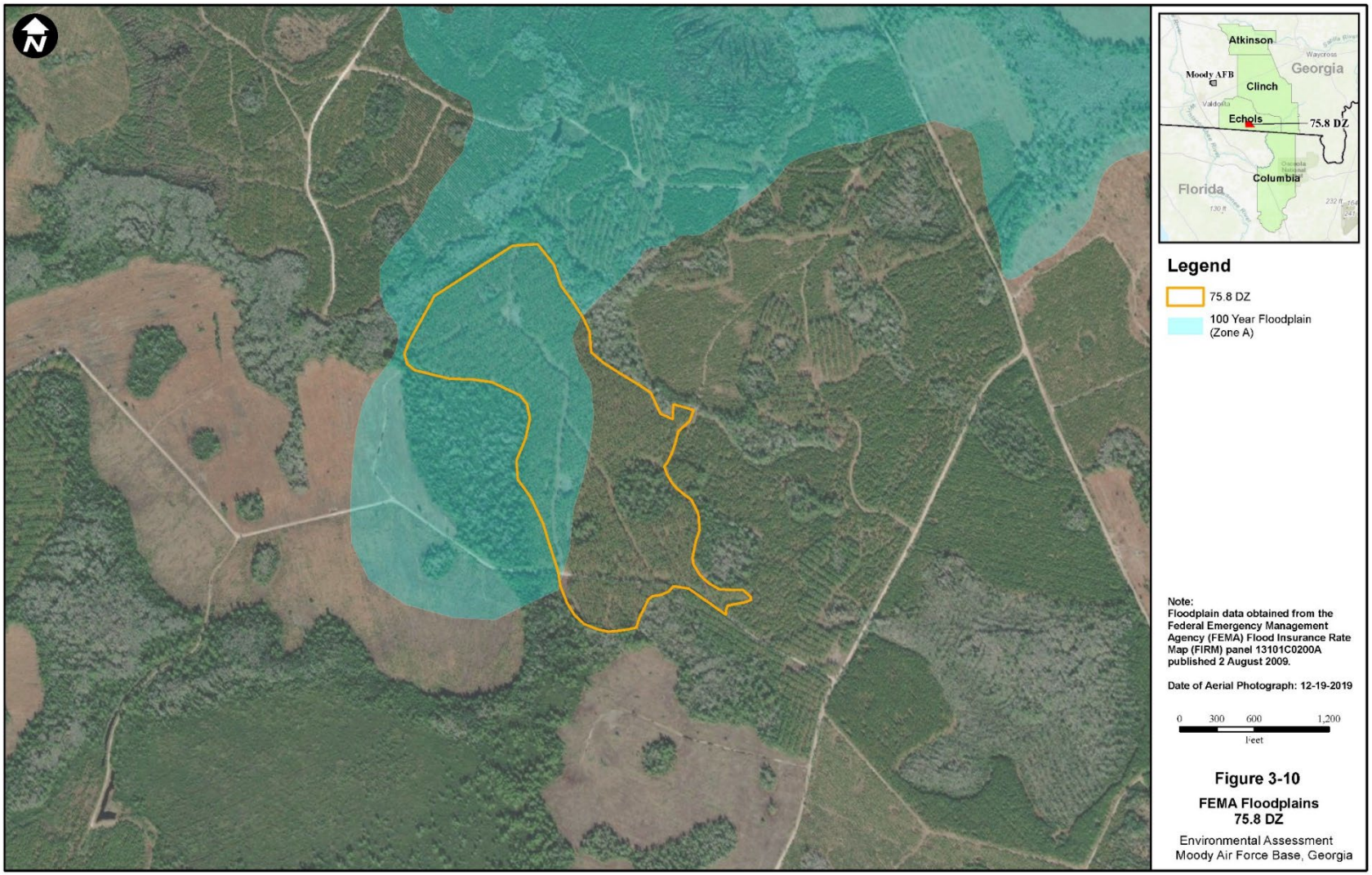


Figure 3-10: FEMA Floodplains 75.8 DZ



3.4.3 Wetlands

3.4.3.1 Definition of the Resource

Wetlands are defined by the United States Army Corps of Engineers (USACE) and EPA as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328.3[b]). Wetlands provide a variety of functions, including groundwater recharge and discharge; flood flow alteration; sediment stabilization; sediment and toxicant retention; nutrient removal and transformation; support of aquatic and terrestrial diversity and abundance; and uniqueness.

Wetlands (and other surface waters) within the study area could potentially be regulated by the USACE as Waters of the U.S., in accordance with the Federal Clean Water Act (CWA) (33 United States Code (USC) §§ 1251 et seq.), Section 10 of the Rivers and Harbors Act of 1899 (RHA) (33 USC § 403), and the USACE regulations, guidance, and applicable manual. Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the CWA.

Moody AFB has not conducted jurisdictional waters delineations for the five HLZ and DZ sites. For planning purposes, this EA uses the USFWS National Wetlands Inventory (NWI) maps to indicate potential wetland within or near the HLZ and DZ sites. Wetlands are classified according to the USFWS NWI on the basis of vegetation type, topography, and hydrologic regime. Additionally, wetland scientists conducted a field reconnaissance in December 2021 as a part of the EA preparation and assessed site wetlands based on the NWI maps. **Figures 3-11** through **3-15** illustrate NWI wetland areas within and in close proximity to the proposed sites. The Proposed Action does not include any construction, occupancy, or other actions that would adversely affect wetland, so EO 11990 requirement to avoid is not applicable and a FONPA is not required.

3.4.3.2 Existing Conditions

L2-A HLZ

Wetlands in the vicinity of Site L2-A are shown on **Figure 3-11**. The NWI map does not indicate any wetland areas within or adjacent to the site, and no obvious wetland areas were observed during the cursory site reconnaissance. The NWI map shows potential wetlands located east of and on the opposite side of the access road.

L4-3 HLZ

Wetlands in the vicinity of Site L4-3 are shown on **Figure 3-12**. The NWI map does not indicate any wetland areas within or adjacent to the site, and no obvious wetland areas were observed during the cursory site reconnaissance.

HLZ 11

Wetlands in the vicinity of Site HLZ 11 are shown on **Figure 3-13**. The NWI map does not indicate any wetland areas within or adjacent to the site, and no obvious wetland areas were observed

during the cursory site reconnaissance. The NWI map shows potential wetlands located 100 feet northwest of the site.

L3-2 DZ

Wetlands in the vicinity of Site L3-2 are shown on **Figure 3-14**. The NWI map indicates two forested wetland areas within the site boundary and additional wetland areas along the northern border. These wetland areas were confirmed during the December 2021 site reconnaissance. The wetland areas were avoided during 2021 timber harvesting, so the wetlands were still vegetated during the site reconnaissance. The wetland in the southeastern portion of the site does not appear to have a direct connection to other streams or wetlands, so it would likely be considered “isolated” by USACE and not subject to Section 404 permitting. Potential wetland areas within the site boundary are approximately 8.0 acres.

75.8 Acre DZ

Wetlands in the vicinity of Site 75.8 DZ are shown on **Figure 3-15**. The NWI map indicates three forested wetland areas within the site boundary and additional wetland areas along much of the southern, western, and northern site borders. These wetland areas were confirmed during the December 2021 site reconnaissance. The wetland areas were generally avoided during 2021 timber harvesting, so most of the NWI wetlands were still vegetated during the site reconnaissance (the exception was a small wetland located in the south-central portion of the site, west of a larger wetland within the site). The three wetlands within the site do not appear to have a direct connection to other streams or wetlands, so they would likely be considered “isolated” by USACE and not subject to Section 404 permitting. Potential wetland areas within the site boundary are approximately 16.6 acres.

Figure 3-11: National Wetlands Inventory L2-A

Figure 3-12: National Wetlands Inventory L4-3

Figure 3-13: National Wetlands Inventory HLZ

Figure 3-14: National Wetlands Inventory L3-2

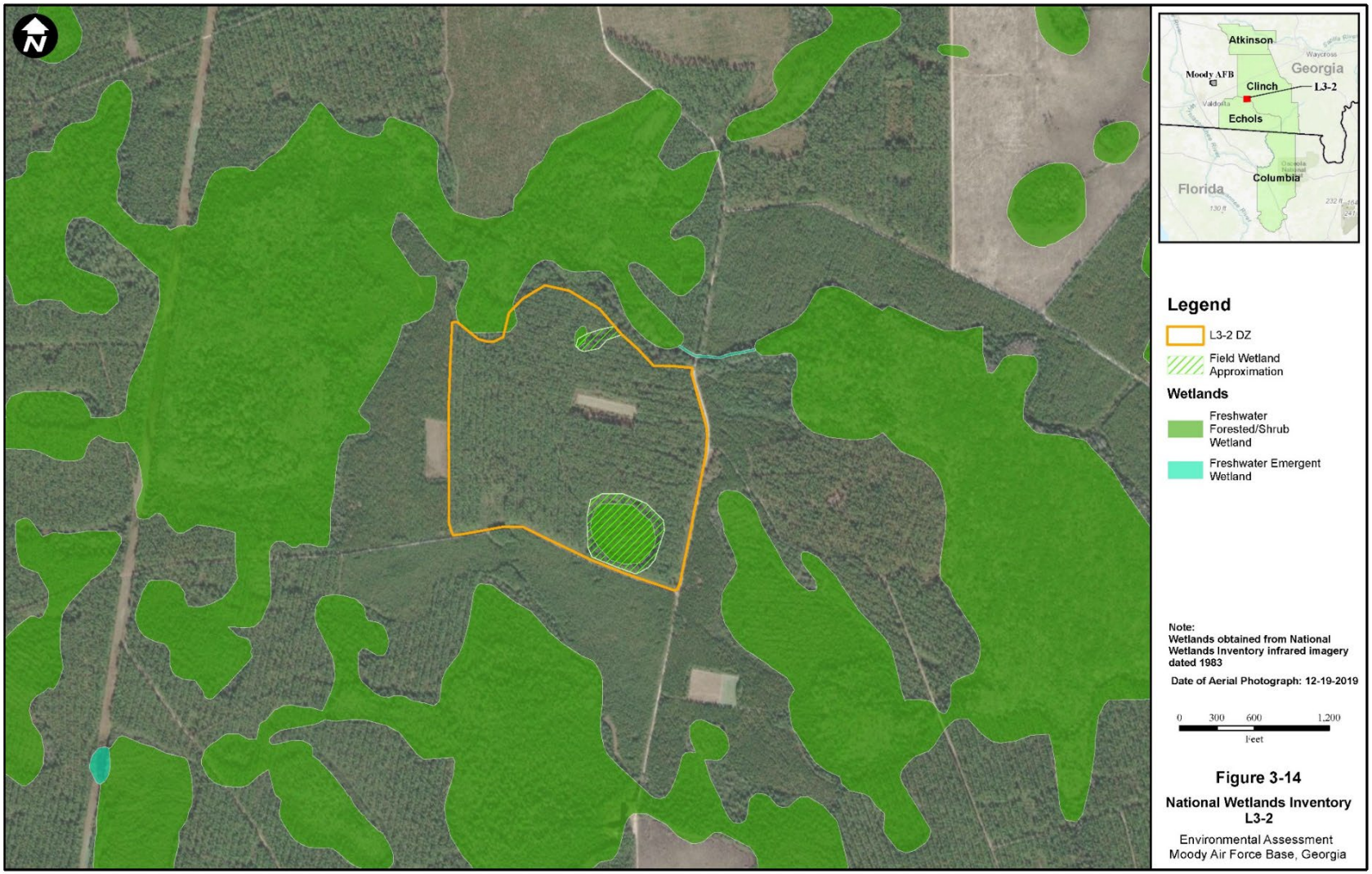


Figure 3-15: National Wetlands Inventory 75.8 DZ

3.5 SAFETY AND OCCUPATIONAL HEALTH

3.5.1 Definition of the Resource

This section addresses flight and ground safety associated with activities conducted by Moody AFB as they relate to the Proposed Action. Flight safety analysis primarily examines potential aircraft accidents that may occur as a result of mid-air collisions. Ground safety analysis evaluates potential safety impacts of ground based-training activities at proposed HLZ and DZ sites. The following aspects of safety were eliminated from detailed analysis and are not discussed further.

Explosives Safety - Munitions used as part of proposed activities would be limited to smoke generators, ground-burst simulators, and small-caliber blank ammunition. These munitions are routinely employed at Moody AFB, are used safely at the existing HLZs and DZs, and would continue to be managed/used according to established safety procedures. There would be no changes to existing quantity-distance arcs or explosive safety zones at the installation, and there would be no activities associated with the Proposed Action that could be impacted by existing quantity-distance arcs.

Bird/Wildlife Aircraft Strike Hazards - Bird/wildlife aircraft strikes constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur. There would be no change in aircraft types or an increase in the number of flight operations at Moody AFB associated with proposed activities. Additionally, all operations would continue to be performed within the current airspace environment and there would be no change in aircraft operating heights AGL except when they land in the HLZs/DZs. Height is a major component in assessing bird-aircraft strike hazard (BASH) risk, and since the aircraft are basically operating within normal AGL restrictions, there should be no greater risk under the Proposed Action. Consequently, no significant changes to the potential for BASH incidents would be anticipated.

Ground Transportation - Proposed activities include the transport over local roadways of vehicles and personnel to HLZs/DZs. All vehicular transportation would be accomplished in accordance with established traffic laws and safety requirements, including Air Force Instruction 91-207, U.S. Air Force Traffic Safety Program.

The ROI for safety includes local areas within the flight pattern of installation aircraft as these relate to proposed activities, as well as HLZs/DZs and their immediately-surrounding areas.

3.5.2 Existing Conditions

3.5.2.1 Flight Safety

It is impossible to predict when and if an aircraft accident may occur. Major considerations in any accident are loss of life and damage to property. The probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. Several factors are relevant in the case of Moody AFB. The region around the base primarily consists of rural or natural areas. Military pilots are instructed to avoid direct overflight of population centers at very low altitudes. In addition, the limited amount of time the aircraft is over any specific geographic area limits the probability that a disabled aircraft would crash into a populated area.

Over the last 10 years, there have been four Class A mishaps associated with Moody AFB aircraft. Class A mishaps are the most serious and result in loss of life, permanent total disability, a total cost in excess of $2 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Three of these mishaps were associated with the A-10 aircraft. The fourth mishap was associated with an HH-60 helicopter while the helicopter was remotely deployed (Goldsworthy, 2013).

Over that same 10-year time span, four near miss Hazardous Air Traffic Reports (HATRs) were recorded at the installation. A near miss is generally considered to be any circumstance in flight where the distance separating two aircraft is considered by either pilot to have constituted a hazardous situation involving a risk of collision

For purposes of this EA, the primary concern for mid-air collisions or near misses would be associated with low-flying military aircraft and privately owned aircraft (primarily crop dusters) operating around proposed HLZs and DZs. There are no active agricultural parcels within one mile of the proposed HLZs or DZs, so crop duster hazards would be minimized. Additionally, none of the four near miss HATRs at Moody AFB were associated with crop dusters.

3.5.2.2 Ground Safety

Moody AFB currently conducts similar HLZ and DZ training activities described in the Proposed Action on a routine basis. These training operations 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 requirements.

In case of a training mishap or other emergency (such as a fire), the Moody AFB fire department is available to respond. The unit has a sufficient number of trained and qualified personnel, and it possesses all equipment necessary to respond to accidents and fires. Additionally, Moody AFB has agreements with local fire departments should additional resources be required.

3.6 BIOLOGICAL/NATURAL RESOURCES

3.6.1 Definition of the Resource

Biological resources consist of vegetation, habitats, and animal species (wildlife and domestic species) that occur on and near the proposed HLZs, potentially including special status species. Special status species are defined as those plant and animal species listed as threatened or endangered or proposed as such by the USFWS, Georgia Department of Natural Resources, or FWCC. The Federal ESA of 1973 protects listed species against killing, harming, harassing, or any action that may damage their habitat.

3.6.2 Existing Conditions

The proposed HLZs/DZs occur in a regional setting consisting of forested natural areas and cleared, open parcels. Generally, the five HLZ/DZ sites, as identified in **Section 2.1**, are surrounded by larger tracts in various stages of silviculture development with surface water occurring near or within several of the site boundaries.

Various wildlife species considered typical of south-central Georgia are expected to occur on or adjacent to the HLZs/DZs. Areas of the sites that are currently open and cleared of mature forest

are anticipated to support a small number of species on a regular basis; including, but not limited to, rodents, rabbits, reptiles, and bird species. Other species may use these open portions temporarily while transiting between areas that contain early successional growth and old growth forests silviculture developmental stages. Species that use the forest edge habitat, such as white-tailed deer (*Odocoileus virginianus*), feral hogs (*Sus scrofa*), and black bear (*Ursus americanus*), may forage within these areas. Proposed HLZs and DZs surrounded by parcels that contain more mature forest are anticipated to contain a larger number of species and diversity of wildlife. Representative wildlife species that may occur in the area are listed in **Table 3-10**. Note that this species list is not exhaustive. No domestic livestock are known to be in the vicinity of the HLZs or DZs.

Special status species are species that are federally- or state-listed as threatened, endangered, rare, or unusual. Species with the potential of occurrence within the project area vicinity, based on habitat, are listed in **Table 3-11**. Visual site reconnaissance of the HLZ/DZ sites were conducted on 8-9 December 2021 and 17 February 2022. No threatened or endangered species or species of concern, or signs of their presence, were observed within the project areas. The proposed HLZs and DZs are in areas actively maintained for timber production (bedding, planting, and harvesting) and are currently cleared of overstory and midstory vegetation. Therefore, although special status species may be found in the general vicinity, occurrence on the HLZs and DZs is considered occasional and transitory.

Table 3-10: Representative Wildlife Species Potentially Occurring on or in the Vicinity of the HLZs

Species Common Name	Species Scientific Name
Mammals	
Coyote	*Canis latrans*
Eastern Cottontail Rabbit	*Sylvilagus floridanus*
Gray Squirrel	*Sciurus carolinensis*
Raccoon	*Procyon lotor*
Red Fox	*Vulpes vulpes*
Striped Skunk	*Mephitis mephitis*
White-tailed Deer	*Odocoileus virginianus*
Birds	
American Crow	*Corvus brachyrhynchos*
Bobwhite Quail	*Colinus virginianus*
Dove	*Zenaida macroura*
Wild Turkey	*Meleagris gallopavo*
Reptiles	
Black Racer Snake	*Coluber constrictor*
Coachwhip Snake	*Masticophis flagellum*
Common Garter Snake	*Thamnophis sirtalis*
Green Anole Lizard	*Anolis carolinensis*

Source: GADNR 2015.

Table 3-11: Special Status Species Potentially Occurring on or in the Vicinity of the HLZs.

Species Common Name	Species Scientific Name	Species Status	Potential HLZ
Mammals			
Florida Black Bear	*Ursus americanus floridanus*	N	L2-A
Rafinesque's Big-eared Bat	*Corynorphinus rafinesquii*	N, SR	L2-A, HLZ 11, L3-2, 75.8 DZ
Sherman's Fox Squirrel	*Sciurus niger shermani*	SSC	L2-A
Southeastern Bat	*Myotis austroriparius*	N	L2-4
Birds			
Bachman's Sparrow	*Peucaea aestivalis*	N	L2-4
Bald Eagle	*Haliaeetus leucocephalus*	BGEPA	L2-A, L4-3, HLZ 11, L3-2, 75.8 DZ
Eastern Black Rail	*Laterallus jamaicensis* ssp. *jamaicensis*	T	L2-A
Florida Burrowing Owl	*Athene cunicularia floridana*	SSC	L2-A
Florida Sandhill Crane	*Grus canadensis pratensis*	ST	L2-A
Red-cockaded Woodpecker	*Picoides borealis*	SE	L3-2
Swallow-tailed Kite	*Elanoides forficatus*	SR	HLZ 11, L3-2, 75.8 DZ
Wood Stork	*Mycteria americana*	T, SE	L2-A, L4-3
Reptiles			
Eastern Indigo Snake	*Drymarchon couperi*	T, ST	L2-A, L4-3, HLZ 11, L3-2, 75.8 DZ
Florida Pine Snake	*Pituophis melanoleucus mugitus*	SSC	L2-A
Gopher Tortoise	*Gopherus polyphemus*	C, ST	L2-A, L4-3, HLZ 11, L3-2, 75.8 DZ
Spotted Turtle	*Clemmys guttata*	SU	L4-3, HLZ 11, L3-2, 75.8 DZ
Suwannee Alligator Snapping Turtle	*Macrochelys suwanniensis*	PT	L4-3, HLZ 11, 75.8 DZ
Amphibians			
Striped Newt	*Notophthalmus perstriatus*	N	L2-A
Fish			
Blackbanded Sunfish	*Enneacanthus chaetodon*	SE	HLZ 11, L3-2, 75.8 DZ
Spotted Bullhead	*Ameiurus serrachanthus*	SR	HLZ 11, 75.8 DZ
Suwannee Bat	*Micropterus notius*	SR	HLZ 11, 75.8 DZ
Insects			

Species Common Name	Species Scientific Name	Species Status	Potential HLZ
Monarch Butterfly	*Danaus plexippus*	C	L2-A, L4-3, HLZ 11, L3-2, 75.8 DZ
Say's Spiketail	*Cordulegaster sayi*	ST	L4-3, HLZ 11, 75.8 DZ
Plants			
Chapman's Sedge	*Carex chapmanii*	N	L2-A
Florida Spiny-pod	*Matelea floridana*	E	L2-A
Florida Toothache Grass	*Ctenium floridanum*	E	L2-A
Georgia Plume	*Elliottia racemosa*	ST	L4-3, HLZ 11, 75.8 DZ
Hartwrightia	*Hartwrightia floridana*	T	L2-A
Incised Groove-bur	*Agrimonia incisa*	T	L2-A
Parrot Pitcherplant	*Sarracenia psittacine*	ST	L3-2
Pondspice	*Litsea aestivalis*	E	L2-A

Sources: FNAI, 2022; GADNR, 2022; USFWS IPaC, 2022.
C = Candidate; E = Federally Endangered; N = Not currently listed, nor currently being considered for listing; PT = Proposed as Federally Threatened; SSC = Species of Special Concern; SR = State Rare; ST = State Threatened; SU = State Unusual; T = Federally Threatened.

Descriptions of each proposed HLZs/DZs are provided below. Descriptive information was derived from site reconnaissance conducted in December 2021 and February 2022, as well as aerial photographs.

L2-A HLZ

The L2-A HLZ is a 0.6-acre parcel located 0.25 miles south of the Georgia border, and 7.5 miles southeast of the town of Fargo. The parcel lies 47 miles southeast of the base. The area has been recently maintained, with ground cover consisting of low grass and shrubs. Observed vegetation during the December 2021 site reconnaissance included wax myrtle (*Morella cerifera*), blackberry (*Rubus sp.*), broomsedge (*Andropogon virginicus*), yellow-eyed grass (*Xyris sp.*), common rush (*Juncus effusus*), and nutsedge (*Cyperus sp.*). Adjacent parcels to the north, south, and west contain young pine trees of approximately ten feet in height. A wooden hunting blind is located along the northwest border, facing a 30 gallon hanging deer feeder found in the south corner. The Georgia Natural, Archaeological, and Historical Geographical Information System (GNAHRGIS) had no records of federally threatened or endangered species within 3 miles of the site. The site does not contain soils listed as suitable for eastern indigo snake/gopher tortoise by USACE and USFWS in their Effects Determination Guidance for Endangered & Threatened Species (EDGES) for eastern indigo snake in Georgia. The site is also not within one of the 13-mile radius wood stork core foraging areas as indicated in the USACE/USFWS EDGES guidance for wood stork in Georgia.

L4-3 HLZ

The L4-3 HLZ is an 0.9-acre parcel located 9.5 miles southwest of the town of Pearson, and 20 miles northeast of Moody AFB. The parcel is bisected by Atkinson County Road 31, 0.8 miles north of Springhead Church Road. The parcel is a cleared logging deck within a loblolly pine

(*Pinus taeda*) plantation. Ground cover consists of shrubs and grass from 2 to 8 feet (Photos 3 and 4). Observed early successional habitat during the December 2021 site reconnaissance included goldenrod (*Solidago* sp.), broomsedge, slender goldentop (*Euthamia graminifolia*), panic grass (*Dichanthelium* sp.), St. John's wort (*Hypericum* sp.), bracken fern (*Ptridium aquillinum*), and woody vine species such as muscadine (*Vitis rotundifolia*), yellow jessamine (*Gelsemium semprevirons*), and sawbriar (*smilax bona-nox*). The shrub layer observed onsite included gallberry (Ilex glabra), wax myrtle, red bay (*Persea borbonia*), dwarf palmetto (*Sabal minor*), winged sumac (*Rhus copallinum*) and blackberry (*Rubus* sp.). Surrounding trees in adjacent parcels are of uniform height and approximately 30 feet tall. GNAHRGIS had five records of federally threatened or endangered species within 3 miles of the site. These included wood stork (1.4 miles to the west), three occurrences of gopher tortoise (1.8 miles to the west, 2.6 miles to the west, and 2.6 miles to the southwest), and eastern indigo snake (2.8 miles to the south). Soils on the site consist of Albany sands, which are classified as "marginal" suitability for use by gopher tortoise and eastern indigo snake in the USACE/USFWS EDGES guidance. No gopher tortoise burrows were observed on the site during the December 2021 site visit. The site is slightly outside of the boundary of a 13-mile radius wood stork core foraging area as indicated in the USACE/USFWS EDGES guidance for wood stork in Georgia.

HLZ 11

The HLZ 11 is an 0.9-acre parcel located 9.5 miles southwest of the town of Pearson, and 26 miles southeast of Moody AFB. The parcel is located 2.3 miles north of State Route 94 along Ford Road. Ground cover consists of shrubs and grass from one to five feet tall. Surrounding trees in adjacent parcels range from 10 to 35 feet tall (Photo 5). The parcel is mostly clear and appears to be maintained. Two tree-mounted hunting blinds are located in the south corner facing a hanging deer feeder found along the northwestern border. GNAHRGIS had no records of federally threatened or endangered species within 3 miles of the site. The site does not contain soils listed as suitable for eastern indigo snake/gopher tortoise by USACE and USFWS in their EDGES guidance for eastern indigo snake in Georgia. The site is also not within one of the wood stork core 13-mile radius foraging areas as indicated in the USACE/USFWS EDGES guidance for wood stork in Georgia.

L3-2 DZ

The L3-2 DZ is an approximately 83-acre parcel located 15 miles southwest of the town of Homerville, and 20 miles southeast of Moody AFB. The parcel is located 1.6 miles north of Georgia State Route 187 along an unnamed access road. L3-2 is bordered to the north, east, and south by trees of uniform height which are approximately 30 feet tall (Photo 7). The plant species observed during the December 2021 and February 2022 site reconnaissance included loblolly pine, sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), gallberry, wax myrtle, and dwarf palmetto. Two undisturbed islands of foliage are located within the DZ; a 4.5-acre parcel in the southeastern corner, and an 0.3-acre island along the north-central border. Both have been designated as freshwater forested/shrub wetland by the National Wetlands Inventory. A wooden hunting blind is located on the eastern section of the site anchored to an approximately 25-foot-tall tree. GNAHRGIS had no records of federally threatened or endangered species within 3 miles of the site. The site does not contain soils listed as suitable for eastern indigo snake/gopher tortoise by USACE and USFWS in their EDGES guidance for eastern indigo snake in Georgia. The site is also not within one of the 13-mile radius wood stork core foraging areas as indicated in the USACE/USFWS EDGES guidance for wood stork in Georgia.

75.8 DZ

The 75.8 DZ is a 75.8-acre, hourglass-shaped parcel located 27 miles southwest of the town of Homerville, Georgia, and 29 miles southeast of Moody AFB. The parcel is located 1.5 miles south of Georgia State Route 94 along Sandy Ford Road. An access road running north-south transects the site, passing by several slash piles from previous logging activity (Photos 9 and 10). The majority of the site contains small grasses and shrubs between two and six feet in height. Observed species during the December 2021 site reconnaissance included dwarf palmetto, wax myrtle, broomsedge, Carolina redroot (*Lachnanthes carolina*), common rush, and blackberry. In addition, some planted pine, loblolly pine, was also observed onsite. Three undisturbed islands of foliage exist throughout the site, which have been designated as freshwater forested/shrub wetland by the National Wetlands Inventory. Surrounding trees in adjacent parcels are of uniform height and approximately 30 feet tall. GNAHRGIS had no records of federally threatened or endangered species within 3 miles of the site. The site does not contain soils listed as suitable for eastern indigo snake/gopher tortoise by USACE and USFWS in their EDGES guidance for eastern indigo snake in Georgia. The site is also not within one of the 13-mile radius wood stork core foraging areas as indicated in the USACE/USFWS EDGES guidance for wood stork in Georgia.

3.7 SOCIOECONOMIC RESOURCES/ENVIRONMENTAL JUSTICE

3.7.1 Definition of the Resource

Socioeconomic resources typically consider population, income, employment, housing, and community services. This section discusses the socioeconomic resources that have the potential to be impacted by activities associated with the Proposed Action occurring on and surrounding the proposed HLZs. No new personnel or construction activities that would impact population, employment, or housing are anticipated as part of the Proposed Action. The main issue of concern is the potential for socioeconomic impacts resulting from loss of agricultural productivity due to use of the HLZs and noise due to aircraft and munitions which might extend beyond the HLZ boundaries and into residential areas.

Concern that certain disadvantaged communities may bear a disproportionate share of adverse health and environmental effects compared with the general population led to the enactment in 1994 of EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This EO directs federal agencies to address disproportionate environmental and human-health effects in minority and low-income communities. In addition, 32 CFR 989, Environmental Impact Analysis Process, addresses the need for consideration of environmental justice issues in compliance with NEPA. EO 12898 applies to federal agencies conducting activities that could substantially affect human health or the environment.

The evaluation of environmental justice is designed to:

- Focus attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice.
- Foster nondiscrimination in federal programs that may substantially affect human health or the environment.

- Give minority communities and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment.

Environmental justice analysis also addresses the protection of children, as required by EO 13045, Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children), issued in 1997 to identify and address issues that affect the protection of children. According to the EO, all federal agencies must assign a high priority to addressing health and safety risks to children, to coordinating research priorities on children's health, and to ensuring that their standards take into account special risks to children. The EO states "…'environmental health risks and safety risks' mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to.)" Concerns about environmental justice and protection of children related to aircraft training and munitions usage typically includes exposure to noise, pollutants, other hazardous materials, and safety hazards.

3.7.2 Existing Conditions

Socioeconomics

The five proposed locations for the HLZs are on privately owned land in rural areas within Atkinson, Clinch, and Echols Counties in Georgia, and Columbia County, Florida. These four counties comprise the ROI. Table 3-12 and 3-13 describes select socioeconomic features of the subject counties and states.

Table 3-12: Georgia Socioeconomic Data

County	Population	Persons Per Square Mile	Households	Median Income ($)	Total Employment
Atkinson	8,286	24.7	2,880	$37,197	1,566
Clinch	6,749	8.5	2,477	$27,658	1,641
Echols	3,697	9.7	1,561	$39,494	105
Average GA County	*67,370 (average)*	*168.4*	*23,640*	*$58,700*	*25,412*

Source: USCB 2022a, 2022c, 2022e, 2022g

Table 3-13: Florida Socioeconomic Data

County	Population	Persons Per Square Mile	Households	Median Income ($)	Total Employment
Columbia	69,698	84.7	25,133	$46,494	19,182
Average FL County	*321,465 (average)*	*350.6*	*115,467*	*$55,660*	*132,239*

Source: USCB, 2022d and 2022f

The areas where the HLZs are located are considered rural and low density. The parcels in which the HLZs are located, and the majority of the adjoining parcels, are classified as either conservation or agricultural. None of the HLZ parcels are classified as residential.

Environmental Justice

Table 3-14 and 3-15 lists the percentage of minority, low-income, and youth populations against the community of comparison (COC) results. The COC values represent the percentages of minority and low-income populations within a geographic extent representing the ROI. Locations where the area of concern (AOC) percentages are greater than the COC percentages are identified as having potential environmental justice concerns. Typically, countywide percentages have been used for the AOC and statewide percentages for the COC. As indicated in Tables 3-14 and 3-15, all of the counties have a lower percentage minority population than state averages, but a higher percentage of low-income individuals and youth compared with state averages.

Table 3-14: Georgia Environmental Justice Data

County	Population	Minority (%)	Low Income (%)	Youth (%)
Atkinson	8,286	23.4%	21.60%	26.2%
Clinch	6,749	30.9%	20.40%	25.1%
Echols	3,697	12.3%	20.60%	26.0%
State of Georgia	*67,370 (average)*	*39.8%*	*14.00%*	*23.6%*

Source: USCB 2022a, 2022c, 2022e, 2022g

Table 3-15: Florida Environmental Justice Data

County	Population	Minority (%)	Low Income (%)	Youth (%)
Columbia	69,698	22.3%	15.60%	21.5%
State of Florida	*321,465 (average)*	*22.7%*	*12.40%*	*19.7%*

Source: USCB, 2022d and 2022f

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 NOISE

4.1.1 Analysis Methodology

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from the implementation of an action. These potential changes may be beneficial if they reduce the number of sensitive receptors exposed to unacceptable noise levels. Conversely, impacts may be significant if they result in an introduction of unacceptable noise levels or increased exposure to unacceptable noise levels for sensitive receptors. Noise associated with an action is compared with existing noise conditions to determine the magnitude of potential impacts.

CEQ states that significance should be determined based on context and intensity. For the noise environment, a significant impact could be determined based on an increase in sound exposure (e.g., larger population of sensitive receptors being exposed to higher noise levels), a change to the type of noise (e.g., a different type of aircraft with a different noise signature), or new sensitive receptors being exposed to new noise sources (e.g., new aircraft noise introduced to an area that has never experienced aircraft noise) when compared to the existing conditions.

Public annoyance is the most common impact associated with exposure to elevated noise levels and is the most severe category of noise impact expected to occur under the Proposed Action.

As described in **Section 3.2**, annoyance due to aircraft noise can be predicted based on the DNL. When subjected to DNL of 65 dB, approximately 12 percent of persons so exposed will be “highly annoyed” by the noise. At levels below 55 dB, the percentage of annoyance is correspondingly lower (less than 3 percent). The percentage of people annoyed by noise never drops to zero (some people are annoyed by any noise), but at levels below 55 dB, it is reduced enough to be essentially negligible.

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmark referred to is 65 dB DNL. This threshold is often used to determine residential land use compatibility around airports, highways, or other transportation corridors. Two other average noise levels are also useful:

- DNL of 55 dB was identified by the USEPA as a level “. . . requisite to protect the public health and welfare with an adequate margin of safety” (USEPA, 1974). Noise may be heard, but there is no risk to public health or welfare.
- A DNL of 75 dB is a threshold above which effects other than annoyance may occur. It is well below levels at which hearing damage is a known risk (OSHA, 1983). However, it is also a level above which some adverse health effects cannot be categorically discounted.

The U.S. Army is the DoD service with the lead role in setting munitions noise policy and has established land use recommendations based on munitions noise levels near training ranges. Army Regulation 200-1 discourages noise-sensitive land uses such as residential in locations where small-arms firing noise exceeds 87 dB and strongly discourages noise-sensitive land uses where levels exceed 104 dB PK 15[met]. The same regulation discourages noise-sensitive land uses such as residential where large-arms noise levels exceed 115 dB and strongly discourages noise-sensitive land uses where large-arms noise exceeds 130 dB PK 15[met]. It should be noted

that these recommendations are associated with military training ranges that are frequently utilized. According to the Occupational Safety and Health Administration, exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level to avoid damage to hearing (OSHA, 1983).

Values for the primary noise metric DNL_{mr} and the supplemental noise metric L_{max} were calculated using the programs Rotorcraft Noise Model (RNM) and MOA-Range NOISEMAP (MR_NMAP). RNM was used for instances where the aircraft location is well-defined, while MR_NMAP was used to calculate noise levels generated by aircraft maneuvering in highly variable patterns near the HLZs and DZs. For this analysis, the DNL_{mr} metric was calculated for an average operational day, meaning that noise energy was averaged only over those days on which aircraft would use the HLZs/DZs. Values for munitions PK 15[met] noise levels were calculated using Small-Arms Noise Assessment Model (SARNAM) for small arms noise and BNOISE2 for explosives noise.

4.1.2 Proposed Action

As described in **Section 2.1**, training would typically occur twice per week at each proposed HLZ and would typically involve two HH-60 aircraft operating at the HLZ for between 30 minutes and two hours. Roughly half the training time at the HLZ would be spent with the helicopter stationary at various altitudes while the crew practices quick-rope and other skills. The other half of the time would be spent making practice approaches to the HLZ. About 40 percent of pattern training time would be spent flying patterns in which the aircraft stay within 1 mile of the HLZ, and the remainder of the time would be spent flying patterns up to 2 miles distant from the HLZ.

HH-60, C-130, and A-10 aircraft have been operating from Moody AFB for several years, and many residents under Moody 2 North and Moody 2 South MOAs have heard their overflights at some point. As noted in **Section 2.1**, A-10 and C-130 aircraft would conduct simulated close air support and air drops in support of HH-60 operations, respectively, during LFEs. These LFEs would occur at a minimum of one time per month at the DZs

While these aircraft types do operate in the affected area currently, they may directly or almost directly overfly the HLZ/DZ during LFEs resulting in an increased concentration of operations relative to baseline conditions.

Noise levels would remain as described in **Section 3.2** as aircraft operations are remaining constant and only the proposed HLZ/DZ areas would experience an infrequent increase in noise resulting from aircraft operations.

Noise levels generated by an HH-60 while it is stationary (either hovering or with engines running on the ground) are listed in **Table 4-1**. As described in **Section 2.1**, stationary time is spent at 75, 45, 35, 15, or 0 feet AGL, depending on the type of training being conducted. Helicopter noise levels have strong “directionality.” This means that the noise level experienced depends heavily on the direction the aircraft is pointing relative to the listener. Noise levels in **Table 4-1** were calculated at the direction of highest noise level, which was found to be 140 degrees to the right of the nose of the aircraft.

Table 4-1: HH-60 Stationary Maximum Noise Levels (L_{max})

Lateral Distance (ft)	L_{max} at Altitude (feet AGL)				
	0	15	35	45	75
1,000	58	68	70	70	69
2,000	50	55	60	61	62
4,000	42	43	46	47	50
8,000	33	32	31	32	34

Source: RNM; used median monthly average acoustic propagation conditions (67° F and 69% relative humidity) Moody AFB 2013
AGL = above ground level; L_{max} = maximum sound level; RNM = Rotorcraft Noise Model

Night training is critically important to mission success in modern warfare, and about 50 percent of training events would occur after dark. Although late-night flights are avoided to the extent practicable, about 20 percent of total training events would take place after 10:00 PM. As described in **Section 3.2**, the time-averaged noise metric DNL includes a "penalty" of 10 dB for events that occur during the late-night period after 10:00 PM and before 7:00 AM.

DNL at various distances from the HLZs/DZs calculated for the estimated 104 days per year on which training could occur are listed in **Table 4-2**. Noise levels were calculated as if all stationary operations would occur at a single location within the HLZ/DZ. Because stationary helicopter training operations would occur at various locations within the HLZ/DZ, actual DNL at specified distances from the HLZ/DZ would be slightly less than values listed in **Table 4-1**. The values listed in **Table 4-2** incorporate noise generated during day-to-day training and LFEs by all military aircraft types at the HLZs/DZs plus baseline training operations in existing special use airspace units.

Table 4-2: DNL at Various Distances from the Training Event

Distance (ft)	DNL (dB)
1,000	61
2,000	57
4,000	55
8,000	49

Source: Moody AFB 2013
dB = decibel; ft = feet

As noted in **Section 2.1**, C-130 airdrops and simulated close-air support with A-10s would be possible only at L3-2 and 75.8-acre HLZs/DZs, and their operations would have little effect on overall DNL (less than 1 dB) near the HLZs/DZs based on their infrequency, limited operation times, and varying higher altitudes.

Approximately 100 blank 7.62-mm (M240) and 500 5.56-mm (M4) rounds would be fired per LFE. Blank rounds do not fire a bullet and are quieter than live rounds. Noise levels generated by gunfire are very dependent on the direction of the listener relative to the line of fire. Although the loudest position relative to the gun is directly in front of the gun, during LFE training gunfire would

be directed toward the center of the HLZ/DZ and away from any noise-sensitive locations outside the HLZ/DZ. Gunfire noise levels listed in **Table 4-3** are for a location perpendicular to the line of fire using the noise metric PK 15[met].

Table 4-3: Small Arms Peak Noise Levels

Munitions	Peak Noise Level (dB PK 15[met]) at Distance in Feet[1]		
	1,000	3,000	6,000
5.56-mm blank	80	67	58
7.62-mm blank	102	89	80

Source: Moody AFB 2013; SARNAM
dB = decibel; PK 15[met] = peak level exceeded only 15 percent of the time

Approximately four Mk-18 and one Mk-23 smoke cartridges would be expended per LFE, but these are relatively quiet. Approximately two ground-burst simulators would be used during each LFE. **Table 4-4** lists the peak noise levels at varying distances from the detonation of explosives.

Table 4-4: Explosives Peak Noise Levels

Munitions	Peak Noise Level (dB PK 15[met]) at Distance in Feet[1]		
	1,000	3,000	6,000
Ground-burst Simulator (M115A2) Modeled as TNT .063Kg (.139lb)	139	125	96

Source: Moody AFB 2013; BNOISE2
dB = decibel; PK 15[met] = peak level exceeded only 15 percent of the time

Figure 4-1 to **Figure 4-5** show areas surrounding the HLZs/DZs where noise would exceed lower threshold values (i.e., 65 dB DNL aircraft noise, 87 PK 15[met] small-arms noise, 115 dB PK 15[met] large-arms noise). **Table 4-5** lists aircraft and munitions noise levels at the closest structure to each HLZ. Distance to the closest structure was determined by examining aerial photos. In all cases, the closest structure appears to be an inhabited residence. Outdoor aircraft time-averaged noise levels and hover noise levels were calculated for the worst-case scenario under which all hover operations would take place at the HLZ/DZ boundary point closest to the structure. Individual overflight noise levels would be variable depending on the specific path followed by the aircraft (see **Table 4-2** for overflight noise levels at various distances). Peak munitions noise levels were calculated for munitions firing at the HLZ/DZ boundary point closest to the structure. For guns, noise levels were calculated for firing at a 90-degree angle relative to the structure.

To summarize, assumptions used in calculating noise levels shown in **Table 4-5** yield the highest noise levels that would potentially occur under normal circumstances. Most events would be substantially less loud. Also, people indoors would benefit from outdoor-to-indoor noise

attenuation provided by the structure. Indoor noise levels are typically 15 to 25 dB less than outdoor noise levels, with the exact difference depending on characteristics of the structure.

Table 4-5: Aircraft and Munitions Noise Levels at Closest Structure

HLZ/DZ	Distance to Closest Structure (in feet)	DNL (dB)	Small-Arms PK 15[met]$_2$	Large-Arms PK 15[met]
HLZ 11	13,220	<65	n/a	n/a
L-2A HLZ	11,580	<65	n/a	n/a
L3-2 DZ	12,980	<65	74	106
L4-3 HLZ	8,460	<65	n/a	n/a
75.8 DZ	23,310	<65	68	98

dB = decibel; DNL = adjusted monthly day-night average sound level; GBS = ground-burst simulators; HLZ = helicopter landing zone; n/a = not applicable; PK 15[met] = peak level exceeded only 15 percent of the time; SARNAM = Small Arms Noise Assessment Model

- SARNAM
- 7.62-mm munitions were modeled for small-arms PK 15[met], which is the louder of the small-arms munitions fired at the HLZs.
- At locations where GBS would not be employed, large-arms peak noise level is listed as “n/a”.

Noise generated by aircraft training at the HLZs/DZs would be noticeable at nearby locations and could disrupt activities, including conversation, watching television, and sleeping, and may be considered annoying. The HLZs/DZs are located in rural areas and only a small number of structures are located nearby. The closest structure to any of the HLZs/DZs is located approximately 8,460 feet from the center of HLZ L4-3; the DNL at this residence would be approximately 49 dB. Residences located farther from the HLZ/DZ than the distances shown in **Table 4-5** would experience fewer overflights and lower time-averaged aircraft noise levels.

Noise generated by firing of blank rounds and simulated explosives would also be very noticeable during LFEs at nearby locations and could also result in activity interference and annoyance. Residences within about 1,000 feet of the small-arms munitions firing could be exposed to peak noise levels at which residential use is strongly discouraged per Army regulations. Also, residences within about 3,600 feet of the small-arms firing could be exposed to noise levels at which residential use is discouraged. Gunfire noise would be similar to that generated by civilian gun use in the area currently. Simulated artillery peak noise could generate noise levels at which residences are strongly discouraged at distances of about 5,600 feet, while residences within about 2,000 feet could be exposed to noise levels at which residences are discouraged. Ground-burst simulators would not be used at HLZs/DZs where residences are located with 1,000 feet of the HLZ/DZ boundary. Peak noise levels would not exceed 140 dB at any residence, and no damage to hearing would be expected.

Army land use recommendations based on peak noise level are generally intended to be used in areas near military munitions training ranges. Munitions training noise near the proposed HLZs/DZs would be temporary, occurring sporadically while the LFE is under way and ending when the LFE is completed. LFEs would occur on average once per month, distributed among all Moody AFB HLZs/DZs. If LFEs were to occur with equal frequency at each of the existing

HLZs/DZs (8), then each proposed HLZ/DZ (2) would be used no more than two times for LFEs per year on average.

As noted previously, approximately 100 of the louder 7.62-mm blank rounds and 500 of the smaller and less loud 5.56-mm rounds would be fired per LFE. In an average year with 12 LFEs, 1200 7.62-mm rounds and 6,000 5.56-mm rounds would be fired. On average, two ground-burst simulators would be used per LFE (24 per average year with 12 LFEs). These numbers of munitions fired are far below the amounts fired at an active military munitions training range. Furthermore, as discussed in **Section 2.1**, as part of the Proposed Action, landowners and nearby residences would be notified when LFEs are scheduled (i.e., when personnel would be on the ground). Specific guidance would be included in the land use agreement.

Overall, HLZ/DZ training noise associated at proposed HLZ/DZ locations could be expected to be annoying to certain nearby residents. However, an increase in operations is not occurring and only new HLZs/DZs are proposed which would reduce daily training and LFE training associated noise at previously established HLZs/DZs. No sensitive receptors would experience noise greater than 65 dB DNL and the percent of those Highly Annoyed is not anticipated to increase. As a result, noise impacts would be negligible at proposed HLZs/DZs and not significant.

4.1.3 No Action Alternative

Under the No Action Alternative, the proposed DZs and HLZs would not be established, and no training operations be conducted at the locations identified. There would be no change to noise levels and no noise impacts as a result of the No Action Alternative.

Figure 4-1: Noise Contours L2-A

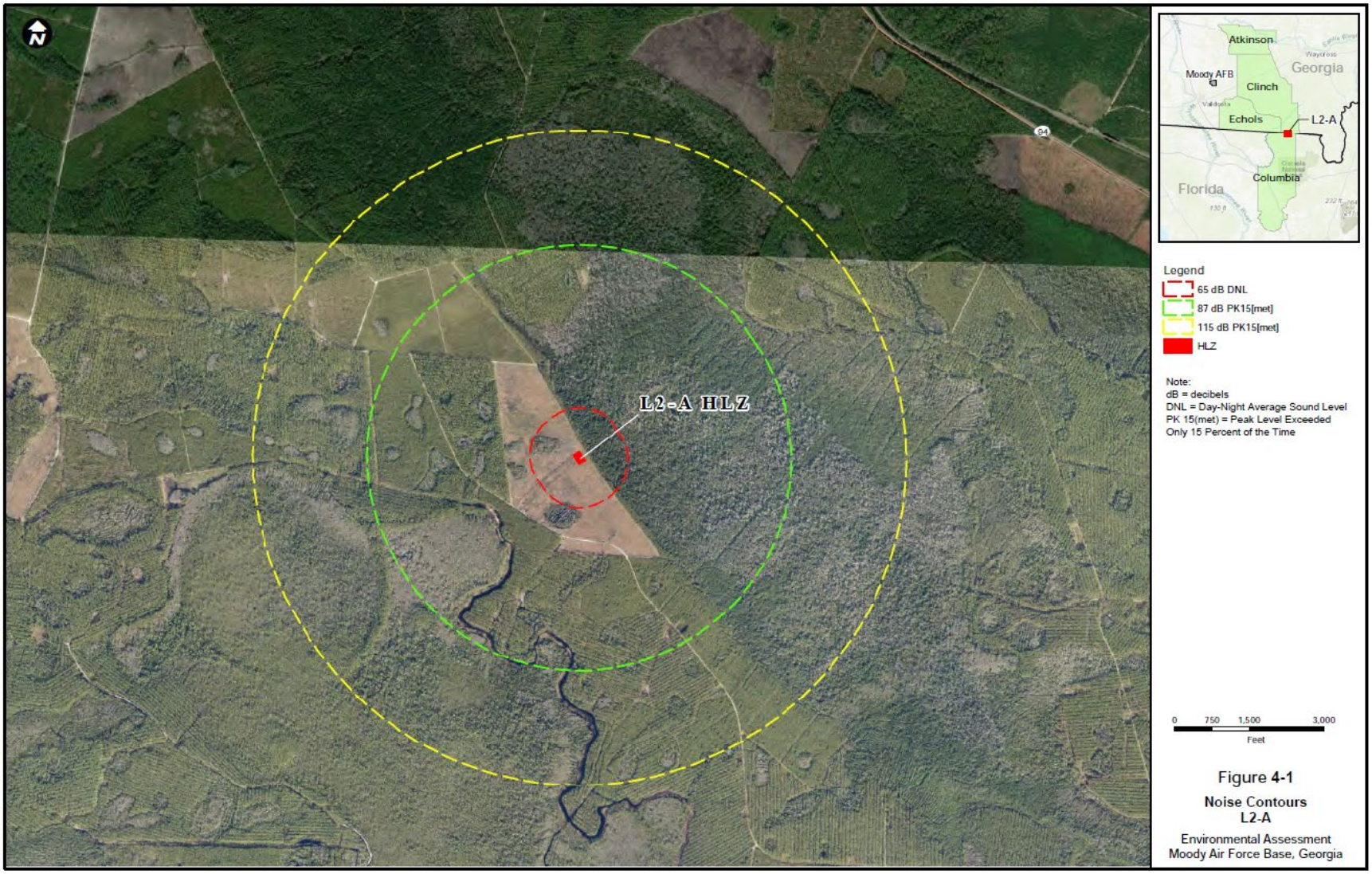


Figure 4-2: Noise Contours L4-3

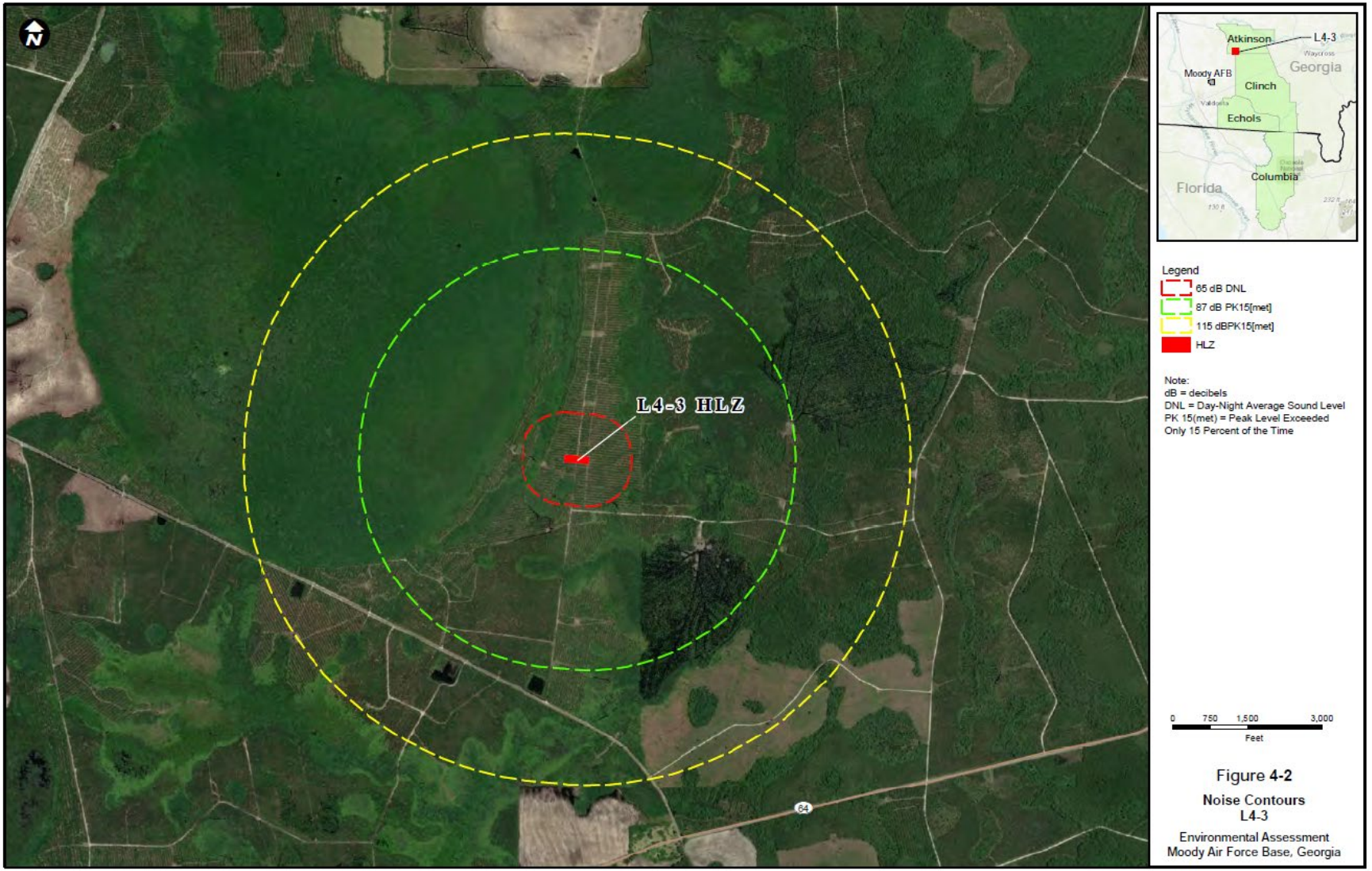


Figure 4-3: Noise Contours HLZ 11

Figure 4-4: Noise Contours L3-2

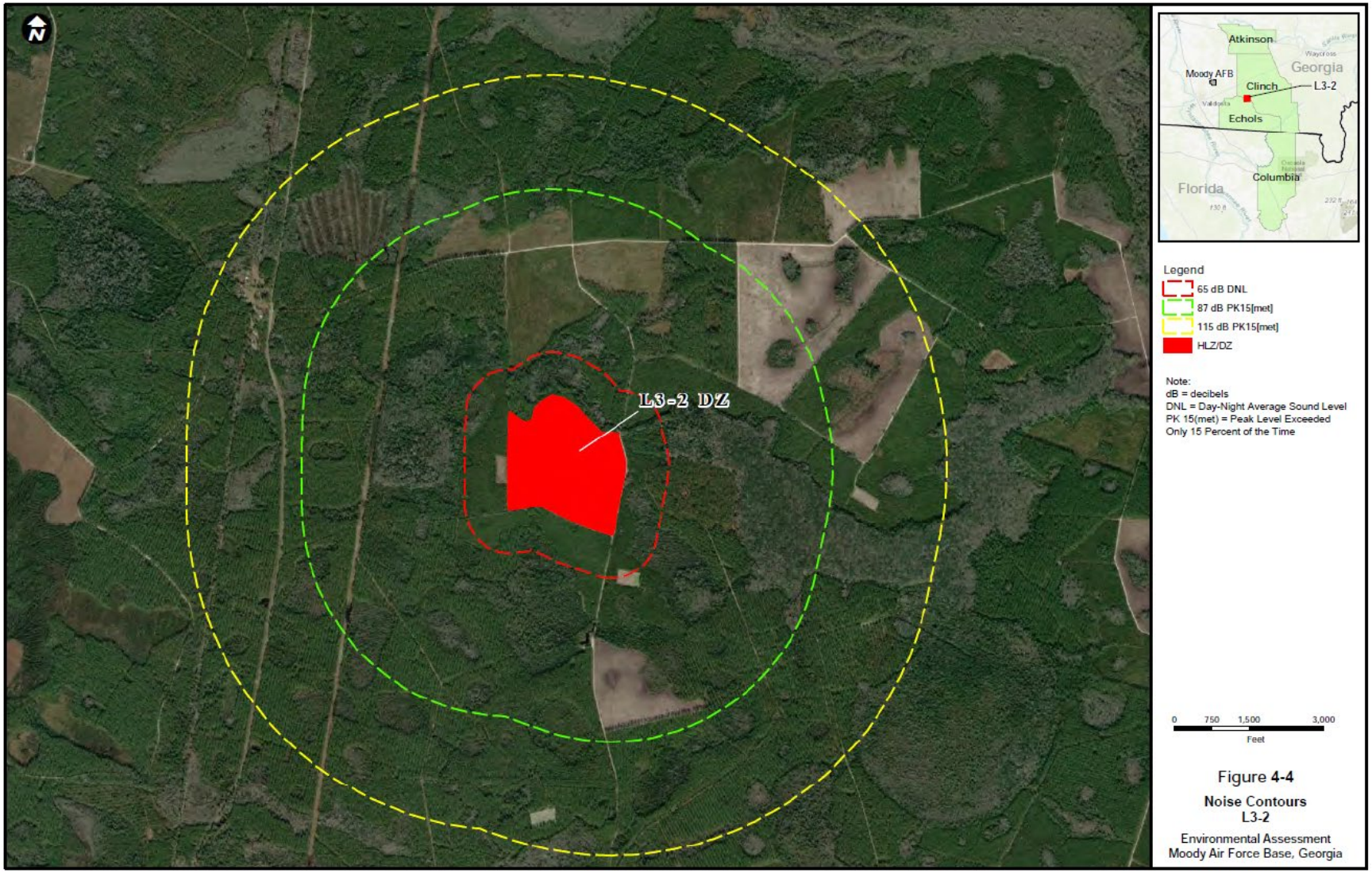
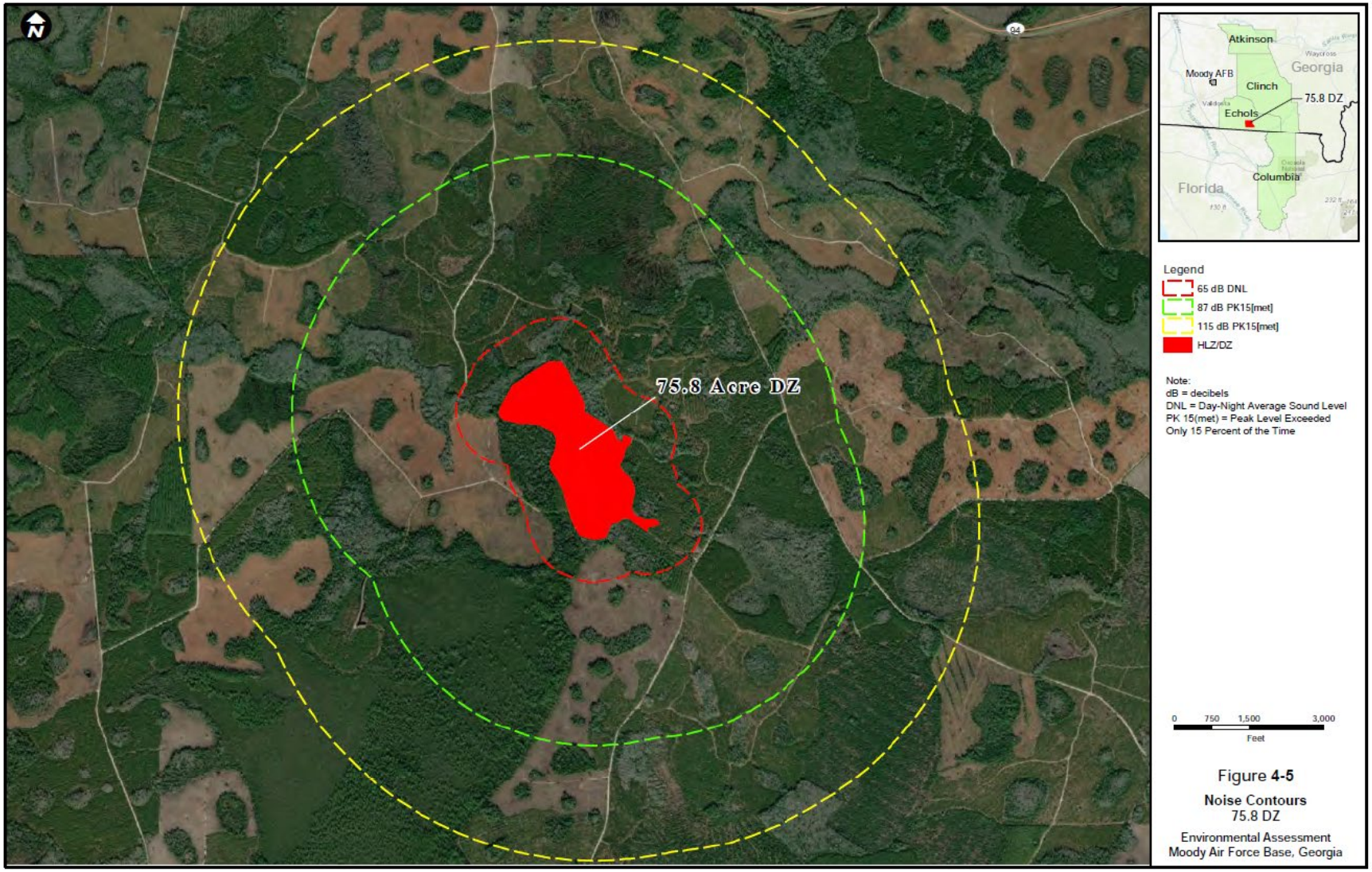


Figure 4-5: Noise Contours 75.8 DZ



4.2 AIR QUALITY

4.2.1 Analysis Methodology

The CAAA of 1990 require that all federal agency activities conform to the applicable State Implementation Plan (SIP) with respect to achieving and maintaining attainment of NAAQS and addressing potential air quality impacts. The USEPA General Conformity Rule requires that a conformity analysis be performed to demonstrate that an action would not: 1) cause or contribute to any new violation of any NAAQS in the area; 2) interfere with provisions in the SIP for maintenance or attainment of any NAAQS; 3) increase the frequency or severity of any existing violation of any NAAQS; or 4) delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP. Provisions in the General Conformity Rule allow for exemptions from performing a conformity determination only if total emissions of individual nonattainment area pollutants resulting from the action fall below the *de minimis* (i.e., significant) threshold values.

With respect to criteria pollutant emissions, effects on air quality would be considered significant if an action would result in an increase of the Regional Emissions Inventory above the General Conformity Rule's *de minimis* threshold levels established in 40 CFR 93.153(b) for individual *nonattainment* or *maintenance* pollutants. As described in Section 3.3.2, *Existing Conditions*, Moody AFB and the five parcels of land for the development of HLZs and DZs are each located in areas currently designated by the USEPA as being in *attainment* with all NAAQS criteria pollutants (USEPA 2022). However, the General Conformity Rule's *de minimis* (i.e., significant) threshold values were used to define whether criteria pollutant emissions from the proposed action would be considered significant or less than significant impacts to air quality. Specifically, criteria pollutant emission rates of less than 100 tons per year would be considered less than significant impacts to air quality.

To evaluate GHG emissions, air emission estimates for the proposed actions were calculated using ACAM in terms of CO_{2e}. The Significance Indication Analysis as described in Section 6.3.1 of the Air Quality EIAP Guide [USAF, 2016c] was then implemented. In guidance issued on 1 August 2016, CEQ did not propose a particular quantity of GHG emissions as "significant" or "insignificant" relating to impacts to the environment or climate change. However, on 3 October 2016, EPA proposed establishing a de minimis value of GHGs or "Significant Emissions Rate" (SER) of 75,000 tons per year CO_{2e} from stationary sources as a basis for requiring sources to obtain a Title V permit if the sources were not otherwise required to obtain a Title V permit. As a result of this rule proposal, the 75,000 tons per year (tpy) CO_{2e} has been used as an indicator of *de minimis* significance; actions resulting in less than 75,000 tpy CO_{2e} of GHG emissions are considered *de minimis* (too trivial or minor to merit consideration) and not significant enough to warrant further NEPA analysis.

Finally, the effects of climate change on the proposed actions were considered as directed in Section 6.4 of the Air Quality EIAP Guide (USAF, 2016c). As with the GHG analysis, actions resulting in less than 75,000 tpy CO_{2e} of GHG emissions have been considered *de minimis* (too trivial or minor to merit consideration) and not significant enough to warrant further NEPA analysis.

4.2.2 Proposed Action

4.2.2.1 L2-A HLZ

The proposed action for the L2-A HLZ would include the addition of day-to-day helicopter (HH-60) training sorties. Day-to-day training activities would consist of an average of two sorties per week and occur 52 weeks per year. Each sortie would include two aircraft that would travel between Moody AFB and the HLZ at 100 to 500 feet AGL and an air speed of 110 KIAS. Each sortie would also have a duration of two hours at the HLZ including:

- 50% of time flying patterns within 2 miles of the HLZ,
- 40% of time hovering over the HLZ, and
- 10% of time running on ground.

Air pollutant emissions including CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, volatile organic carbon (VOC), and CO_2 would be associated with HH-60 operations. Potential air emissions associated with these operations were quantified using ACAM. Because the flight altitude is below the atmospheric mixing level (approximately

3,000 feet), air emissions from HH-60 operations during transit to and from the HLZ were included in the potential air emission calculations. Details regarding these calculations are presented in **Appendix B**.

4.2.2.2 L4-3 HLZ

The proposed action for the L4-3 HLZ would include the addition of day-to-day helicopter (HH-60) training sorties. Day-to-day training activities would consist of an average of two sorties per week and occur 52 weeks per year. Each sortie would include two aircraft that would travel between Moody AFB and the HLZ at 100 to 500 feet AGL and an air speed of 110 KIAS. Each sortie would also have a duration of two hours at the HLZ including:

- 50% of time flying patterns within 2 miles of the HLZ,
- 40% of time hovering over the HLZ, and
- 10% of time running on ground.

Air pollutant emissions including CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, VOC, and CO_2 would be associated with HH-60 operations. Potential air emissions associated with these operations were quantified using ACAM. Because the flight altitude is below the atmospheric mixing level (approximately 3,000 feet), air emissions from HH-60 operations during transit to and from the HLZ were included in the potential air emission calculations. Details regarding these calculations are presented in **Appendix B**.

4.2.2.3 HLZ 11

The proposed action for HLZ 11 would include the addition of day-to-day helicopter (HH-60) training sorties. Day-to-day training activities would consist of an average of two sorties per week and occur 52 weeks per year. Each sortie would include two aircraft that would travel between Moody AFB and the HLZ at 100 to 500 feet AGL and an air speed of 110 KIAS. Each sortie would also have a duration of two hours at the HLZ including:

- 50% of time flying patterns within 2 miles of the HLZ,
- 40% of time hovering over the HLZ, and
- 10% of time running on ground.

Air pollutant emissions including CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, VOC, and CO_2 would be associated with HH-60 operations. Potential air emissions associated with these operations were quantified using ACAM. Because the flight altitude is below the atmospheric mixing level (approximately 3,000 feet), air emissions from HH-60 operations during transit to and from the HLZ were included in the potential air emission calculations. Details regarding these calculations are presented in **Appendix B**.

4.2.2.4 L3-2 DZ

The proposed action for the L3-2 DZ would include the addition of day-to-day helicopter (HH-60) training sorties. Day-to-day training activities would consist of an average of two sorties per week and occur 52 weeks per year. Each sortie would include two aircraft that would travel between Moody AFB and the DZ at 100 to 500 feet AGL and an air speed of 110 KIAS. Each sortie would also have a duration of two hours at the DZ including:

- 50% of time flying patterns within 2 miles of the DZ,
- 40% of time hovering over the DZ, and
- 10% of time running on ground.

Air pollutant emissions including CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, VOC, and CO_2 would be associated with HH-60 operations. Potential air emissions associated with these operations were quantified using ACAM. Because the flight altitude is below the atmospheric mixing level (approximately 3,000 feet), air emissions from HH-60 operations during transit to and from the DZ were included in the potential air emission calculations. Details regarding these calculations are presented in **Appendix B.**

In addition to the day-to-day HH-60 training sorties, the L3-2 DZ would also be used for occasional training involving HH-60, C-130, and A-10 aircraft; ground vehicles; and munitions usage. Occasional training activities would occur two times per month, 12 months per year. Each activity would include a single sortie involving two HH-60 aircraft similar to the day-to-day helicopter training sorties described above.

Occasional training would also include one C-130 and one A-10 aircraft making a sortie from Moody AFB to the L3-2 DZ. Travel between Moody AFB and the DZ was assumed to follow a normal departure profile from Moody AFB and to exceed 3,000 feet AGL for most of the transit. Once near the DZ, the C-130 aircraft would assume a flight pattern within 10 miles of the DZ at 300 to 1,000 feet AGL and make run-ins for equipment, supply, or personnel drops. Each C-130 sortie would have a duration of 2 hours at the DZ. Once near the DZ, the A-10 aircraft would assume a flight pattern within several miles of the DZ at 100 to 18,000 feet AGL and make run-ins for CAS. Each A-10 sortie would have a duration of 2 hours at the DZ. For the air quality analysis, the entire duration was assumed to occur below the atmospheric mixing level (approximately 3,000 feet).

Occasional training would also include two ground vehicles and the use of munitions by ground forces. The ground vehicles would travel between Moody AFB and the L3-2 DZ. Munitions usage would consist of

- Approximately 100 7.62-mm (M240) rounds per month
- Approximately 500 5.56-mm (M4) rounds per month
- Approximately four Mk-18 and one Mk-23 smoke cartridge per month
- Chemical light sticks
- Approximately two ground-burst simulators per LFE.

Air pollutant emissions including CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, VOC, and CO_2 would be associated with aircraft operations. These pollutants would also be produced by ground vehicle and munitions usage. Potential air emissions associated with these operations were quantified using ACAM. Because the flight altitude is below the atmospheric mixing level (approximately 3,000 feet), air emissions from HH-60 operations during transit to and from the DZ were included in the potential air emission calculations. Ground vehicle emissions during transit to and from the DZ were also included in the potential air emission calculations. Details regarding these calculations are presented in **Appendix B**.

4.2.2.5 75.8 Acre DZ

The proposed action for the 75.8 Acre DZ is identical to that associated with the L3-2 DZ as described in **Section 4.2.2.4**. Potential air emissions associated with these operations were quantified using engineering analyses and details regarding these calculations are presented in **Appendix B**.

Air emissions from the proposed action are summarized in **Table 4-6**. None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

Table 4-6: Air Quality Impacts from Proposed Action

Description	Air Pollutant Emissions (tons per year)						
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2
Proposed Action - L2-A HLZ	2.01	4.19	0.73	0.65	0.40	0.01	1,197
Proposed Action - L4-3 HLZ	1.78	3.43	0.58	0.52	0.33	0.01	990
Proposed Action - HLZ 11	1.83	3.60	0.61	0.55	0.34	0.01	1,036
Proposed Action - L3-2 DZ	6.11	6.45	1.17	0.98	0.70	1.49	2,127
Proposed Action - 75.8 Acre DZ	6.20	6.76	1.23	1.03	0.73	1.49	2,212
Total	17.94	24.42	4.33	3.75	2.50	3.01	7,562
Insignificance Indicator	250	250	250	250	250	250	75,000
Exceedance?	No	No	No	No	No	No	No

4.2.3 No Action Alternative

Under the No-Action Alternative, air quality within the project area would remain unchanged because the proposed action would not be implemented.

4.3 WATER RESOURCES

4.3.1 Surface Waters and Water Quality

4.3.1.1 Analysis Methodology

Significance of potential impacts to water resources is based on water availability, water quality, and use. An impact to water resources would be significant if it would

- reduce water availability or quality or interfere with the supply of existing users,
- adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions,
- threaten or damage unique hydrologic characteristics, or
- violate laws or regulations that have been established to protect or manage water resources of an area.

4.3.1.2 Proposed Action

L2-A HLZ

Site L2-A does not contain surface waters, so the use of the site as a HLZ would not impact surface waters or water quality.

L4-3 HLZ

Site L4-3A does not contain surface waters, so the use of the site as a HLZ would not impact surface waters or water quality.

HLZ 11

Site HLZ 11 does not contain surface waters, so the use of the site as a HLZ would not impact surface waters or water quality.

L3-2 DZ

Site L3-2 does not contain surface waters, so the use of the site as a DZ would not impact surface waters or water quality. The perennial stream with adjacent wetlands approximately 100 feet northeast of the northern property boundary would be avoided during any activities at the DZ. Potential isolated wetland areas within or near the site are described in **Section 4.3.3.1** on wetlands, below.

75.8 Acre DZ

Site 75.8 DZ does not contain surface waters, so the use of the site as a HLZ would not impact surface waters or water quality.

Furthermore, personnel and vehicles would avoid any adjacent wetlands or waterways, and proposed training activities at the HLZs and DZs would not involve construction or land disturbance. As a result, the Air Force has not identified any potential for direct or indirect impacts to water resources resulting from the Proposed Action.

4.3.1.3 No Action Alternative

Under the No-Action Alternative, surface waters and water quality within the project area would remain unchanged because the proposed action would not be implemented.

4.3.2 Floodplains

4.3.2.1 Analysis Methodology

Evaluation criteria for potential impacts to floodplains include endangerment of public health by creating or worsening health hazard conditions or violating established laws or regulations adopted to protect floodplains. Potential impacts related to flood hazards can be significant if such actions are proposed in areas with high probabilities of flooding; however, impacts can be mitigated through the use of design features to minimize the effects of flooding.

4.3.2.2 Proposed Action

L2-A HLZ

No designated 100-year floodplain areas are located within the site, so the use of the site would not impact floodplains.

L4-3 HLZ

No designated 100-year floodplain areas are located within the site, so the use of the site would not impact floodplains.

HLZ 11

Over half of the site is located within the designated 100-year floodplain associated with Toms Creek/Simmons Bay. However, the proposed action does not require any ground modifications or surface construction to use the site as an HLZ. Training activities located within the 100-year floodplain would not alter floodplain hydrology or cause induced flooding in areas not currently located within the floodplain. Thus, there would be no impact to the 100-year floodplain.

L3-2 DZ

No designated 100-year floodplain areas are located within the site, so the use of the site would not impact floodplains.

75.8 Acre DZ

Approximately half of the site is located within the designated 100-year floodplain associated with Toms Creek. However, the proposed action does not require any ground modifications or surface construction to use the site as a DZ. Training activity located within the 100-year floodplain would not alter floodplain hydrology or cause induced flooding in areas not currently located within the floodplain. Thus, there would be no impact to the 100-year floodplain.

4.3.2.3 No Action Alternative

Under the No-Action Alternative, floodplains within the project area would remain unchanged because the proposed action would not be implemented.

4.3.3 Wetlands

4.3.3.1 Analysis Methodology

Significance of potential impacts to wetlands is based on impacts to wetland functions and values. An impact to wetlands would be significant if it reduced wetland function and/or required Section 404 authorization for impacts.

4.3.3.2 Proposed Action

L2-A HLZ

No potential jurisdictional wetlands are located within the site, so the use of the site would not impact wetland functions or values.

L4-3 HLZ

No potential jurisdictional wetlands are located within the site, so the use of the site would not impact wetland functions or values.

HLZ 11

No potential jurisdictional wetlands are located within the site, so the use of the site would not impact wetland functions or values.

L3-2 DZ

Two forested wetland areas are within the site boundary and additional wetland areas are located along the northern border. The wetland areas were avoided during 2021 timber harvesting, so the wetlands were still vegetated during the site reconnaissance. The wetland in the southeastern portion of the site does not appear to have a direct connection to other streams or wetlands, so it would likely be considered "isolated" by USACE and not subject to Section 404 permitting. The property owner will maintain the cleared areas around the existing wetlands and will avoid additional clearing of wetland areas. These wooded areas will be obvious to personnel and will be avoided during training activities.

Wetlands within the site would be avoided by landing aircraft and exercises. Because the wetlands would be avoided by activities related to use of the site as a DZ, no impacts to wetlands would be expected.

75.8 Acre DZ

The NWI map indicates three forested wetland areas within the site boundary The wetland areas were generally avoided during 2021 timber harvesting, so most of the NWI wetlands were still vegetated during the site reconnaissance (the exception was a small wetland located in the south-central portion of the site, west of a larger wetland within the site). The three wetlands within the site do not appear to have a direct connection to other streams or wetlands, so they would likely be considered "isolated" by USACE and not subject to Section 404 permitting. The property owner will maintain the cleared areas around the existing wetlands and will avoid additional clearing of wetland areas. These wooded areas will be obvious to personnel and will be avoided during training activities.

Wetlands within the site would be avoided by landing aircraft and exercises. Because the wetlands would be avoided by activities related to use of the site as a DZ, no impacts to wetlands would be expected.

Furthermore, personnel and vehicles would avoid any adjacent wetlands or waterways, and proposed training activities at the HLZs and DZs would not involve construction or land disturbance. As a result, the Air Force has not identified any potential for direct or indirect impacts to water resources resulting from the Proposed Action.

4.3.3.3 No Action Alternative

Under the No-Action Alternative, wetlands within the project area would remain unchanged because the proposed action would not be implemented.

4.4 SAFETY AND OCCUPATIONAL HEALTH

4.4.1 Analysis Methodology

This section addresses the potential for the Proposed Action to increase flight and ground safety risks, as well as the Air Force's capability to manage these risks. Impacts to aircraft and public safety would be considered significant if the ability to provide for safe operation of aircraft is diminished or uncontrollable safety hazards are introduced to risk military personnel, the public, or property.

4.4.2 Proposed Action

Flight Safety

Under the Proposed Action, there would be no change in the types of aircraft operating at Moody AFB nor would the number of flight sorties increase. Additionally, all flight operations would continue to be performed within the current airspace environment. Consequently, no significant changes to potential for aircraft mishaps would be anticipated.

As discussed in Chapter 3, crop dusting occurs in the region, with crop duster aircraft operating from some airports near Moody AFB. Although these operations are not common, there is a potential for mid-air collisions or near misses associated with low-flying crop dusters and military aircraft, such as helicopters. There have been four near miss HATRs filed at Moody AFB during the last 10 years; however, none of these were associated with crop dusters.

The most advanced piece of mid-air collision avoidance equipment in the cockpit is the human eye. Since the number one cause of mid-air collisions is the failure to “see and avoid,” efficient use of visual techniques and knowledge of the eye’s limitations are crucial in helping to avoid collisions.

Crop dusters most commonly operate through a series of multiple low-passes above the target crop, with cross country transit limited to direct to-and-from flight from the origin airport to the crop. Large acreage farms typically use crop-dusters to maximize efficiency in application of pesticides. Upon review of aerial images and nearby property records, there are no significant agricultural operations within one mile of the subject properties (qPublic, 2022). There are also no small airports within 10 miles of each of the HLZs/DZs, reducing the risk of encounter with crop dusters and other private aircraft (SkyVector, 2022).

To minimize the potential for mid-air collisions or near misses, Moody AFB would continue to implement its Mid-Air Collision Avoidance (MACA) Program, with a particular emphasis on local crop duster operations. This program is designed to help increase military pilot awareness of the training airspace and activities. Additionally, the MACA Program informs local airports with known crop duster operations of airspace, HLZ/DZ locations, and low-level flight areas.

Ground Safety

Pyrotechnics Use - Ground-burst simulators and smoke cartridges would be employed as part of proposed activities. Ground-burst simulators replicate the detonation of artillery and mortar projectiles or artillery-type rockets. They typically produce a high-pitched whistle that lasts two to four seconds and then detonate with a loud report and brilliant flash. Smoke cartridges are used by ground soldiers to signal aircraft. They are designed to produce a smoke cloud that lasts up to 30 seconds. The devices operate by burning and/or detonating a small pyrotechnic charge. Safety procedures are currently in place to prevent potential injuries associated with loud noises or with flying debris generated during detonation of these devices. The use of ground-burst simulators and smoke cartridges could also have an impact on ground safety in the form of an increased wildfire risk. To minimize the potential for fire, the use of these devices would be prohibited during high-risk fire days (e.g., very dry conditions and days with high winds). The Moody AFB fire department or local fire departments would be available to respond in case of fire caused by pyrotechnic devices.

Air Drops - Training operations may require the dropping of sandbags, water barrels, or rubber-containing barrels by aircraft to the HLZ area. To avoid the potential for injury to personnel on the ground, positive two-way communication would be established and maintained between the pilot and personnel on the ground prior to any drops. Ground personnel directing aircraft to targets would also ensure that all personnel are well clear of the area and that target descriptions are clear and understood by the pilots.

Safety Summary

The operations described are routinely conducted in and around Moody AFB at other HLZs. The Proposed Action would not negatively affect the ability to provide for safe operation of aircraft nor would it result in uncontrollable safety hazards to military personnel, the public, or property. Implementation of established procedures, including those presented above, would ensure that activities associated with the Proposed Action would not result in significant impacts to safety.

4.4.3 No Action Alternative

Under the No Action Alternative, additional HLZs would not be acquired; however, current HLZ training operations at Moody AFB would continue. Consequently, no impacts other than those associated with current operations would be expected.

4.5 BIOLOGICAL/NATURAL RESOURCES

4.5.1 Analysis Methodology

Impacts are evaluated for vegetation, wildlife species, and protected species. Activities would not affect aquatic habitats. The methodology begins with identification of areas where resource occurrence overlaps the direct and indirect project footprint. The animal and plant resources potentially affected are identified based on habitat type and previous documented occurrence. Impacts are evaluated for significance based on the potential for long-term effects resulting from ground activities and air training. The greatest potential for impacts would result from noise, including aircraft overflights, small arms use, and ground-burst simulator use.

4.5.2 Proposed Action

Overall, there would be no significant adverse impacts to wildlife or protected species. Consultation with the USFWS is pending. Concurrence from the USFWS is anticipated due to the analysis of potential impacts to wildlife as presented in this EA demonstrated no effects on listed species.

There would be no construction, tree clearing, or other substantial ground disturbance associated with the Proposed Action, and thus no effect to vegetation due to these activities. Potential impacts to vegetation would be limited to quarterly mowing by the property owner, helicopter rotor wash, movement and placement of personnel and equipment during training events, and helicopter touch-downs. These events would likely result in only minimal, temporary damage to vegetation. Training involving ground activities would occur infrequently at any given HLZ or DZ and helicopter touchdowns would occur within mowed and maintained areas.

Wildlife could be affected by ground activities, rotor wash, air drops, visual perception of aircraft, and noise associated with aircraft overflights and munitions use. Ground training would involve a

relatively small number of people (approximately 10), so the presence and movement of personnel and equipment would result in only minor and temporary disturbance to animal species located near the activities.

Rotor wash could damage wildlife such as birds or bird nests if present at areas where helicopter touchdown or low-altitude hovering occurs. However, the number of individuals affected would likely be small and would result in no overall significant effects to populations. In addition, wildlife would likely leave areas near the landing point when noise from an approaching or departing aircraft occurred. Air drops could potentially result in a direct animal strike. The likelihood of such an event is not quantified but is considered remote due to the relatively low frequency of these activities and their occurrence in cleared areas, which are expected to support less wildlife than nearby undeveloped, wooded habitat.

Short-term startle effects due to visual sightings of aircraft could cause temporary displacement of individuals inhabiting areas surrounding the HLZs and DZs. However, animal species would likely habituate to aircraft presence over time, given the ongoing tempo of day-to-day training. Long-term reactions or significant behavior modifications are not expected from visual aircraft sightings.

Lastly, animal species, including wildlife and protected species, could be affected by noise associated with aircraft overflights, helicopter landings, and munitions use. The potential effects of aircraft overflight on animals have been investigated to varying degrees, depending on the species. A substantial literature synthesis report was compiled and published in 1998 as a cooperative effort between the USFWS and the Air Force Engineering and Services Center at Tyndall AFB, Florida (Manci et al., 1988). A review of available literature of the effects of aircraft noise on domestic animals (among other types of animals) is also provided by NoiseQuest (2013). The following information is derived from these sources, except where otherwise noted.

Animal response to aircraft noise is influenced by many variables such as aircraft size, speed, proximity, and engine noise level, among others. In addition, response may differ according to aircraft type (fixed-wing versus rotor-wing). Noise effects may be categorized as primary, secondary, and tertiary. Primary effects include direct physical auditory impacts such as eardrum rupture and hearing threshold shifts. Secondary effects include stress, behavioral changes, and decreased ability to perform functions such as obtaining food. Tertiary effects include population decline and habitat destruction. Stress and associated behavioral changes may be among the more commonly observed effects of noise. A sudden or unfamiliar sound may act as an alarm, activating the sympathetic nervous system and triggering short-term physiological reactions (fight-or-flight response). These reactions cause energy reserves to be used, may interrupt important behaviors, and may result in injury (trampling, etc.). Conversely, wildlife may become habituated to repeated noise and show no observable response over time. While birds, small mammals, and reptiles may experience noise and associated effects to varying degrees, such species occurrences are expected to be insignificant based on the condition of the HLZs and DZs (i.e., disturbed, recently harvested timber plantations) and the extent of use under the Proposed Action. Domestic livestock near HLZ or DZ locations would be a concern, but no domestic livestock are known to be located near the proposed HLZs or DZs.

Sound levels below 90 dB usually result in substantially less adverse behavior. Similar to the discussion of mammals in general, the 90 dB noise level may be considered a reasonable indicator of potential effects to domestic livestock. Noise levels produced by aircraft at various

altitudes and distances from the source, as well as by munitions, are presented in **Section 4.1**.

In the following subsections, these noise levels are evaluated in the context of biological noise receptors located on and near the HLZs and DZs. Noise receptors include wildlife species. It may be assumed that a greater number and diversity of wildlife species could occur in natural, wooded areas as compared to more developed or cleared sites. All of the HLZs and DZs have wooded habitat located on or directly adjacent to the sites.

Aircraft Use

Noise produced by aircraft overflights and helicopter hovering would likely disturb wildlife on the HLZs, DZs, and the nearby vicinity. The potential for impacts due to overflights would be greater than that associated with hovering. Birds may react by exhibiting a startle response. Based on previous studies and depending on the species and type of activity at the time of exposure, response could range from simply looking toward the aircraft to flushing (and associated energy expenditure) or other effects such as interruptions of nesting or breeding and abandonment of young. Raptors would probably have the least potential for behavioral reactions, while waterfowl and some passerines would be more likely to be affected.

To minimize potential impacts to protected species and/or sensitive habitats and per existing consultation agreements with USFWS, wood stork rookeries and bald eagle nests would be avoided by 1 lateral mile. None of the sites are located within known wood stork 13-mile core foraging areas.

Low-level flights would likely disturb or cause a startle reaction in mammal species. Although the effects on some comparatively large mammals specifically found in the area (e.g., deer, black bears) are uncertain, it may be assumed that noise levels greater than 90 dB would cause at least some behavioral reaction such as freezing or fleeing. Various effects, including startle effects and potential changes in habitat use, could occur in smaller mammal predators such as coyotes and foxes. Although effects to small mammals such as squirrels, mice, and rats have been suggested at noise levels from 69 to 115 dBA, based on discussion provided in U.S. Air Force (2001), the effects are likely to be small.

In general, although wildlife species may exhibit startle or escape responses to aircraft overflight, these responses are not necessarily detrimental long-term to a species, nor is reaction to aircraft noise alone enough to imply adverse effect. Animals react to a variety of external stimuli. Most affected individuals would likely resume normal activities soon after training events are completed. Low-level aircraft flight noise is not expected to significantly affect the overall health or viability of wildlife populations.

Munitions Use / Ground Training

Wildlife could also be disturbed by noise produced during small arms fire and use of ground-burst simulators. Individuals could be startled by the firing of 5.56-mm and 7.62-mm inert rounds, with reactions similar to those described for overflight noise. The 7.62-mm rounds would be the more impactive of the two sizes, producing noise levels of 102 dB at 1,000 feet from the firing point. However, most animals in the immediate vicinity of ground training operations would be aware of human presence and may move some distance away before munitions were fired, thus exposing fewer individuals to noise effects. Ground-burst simulators would produce substantially greater noise levels, potentially resulting in physiological harm (hearing effects) or behavioral effects.

Although it is assumed that the simulators would be placed in open areas, where species numbers would be smaller compared to natural areas, noise would propagate for some distance, with the 96 dB level extending for 6,000 feet. This would potentially affect wildlife occurring well outside the HLZ and DZ boundaries.

Several factors could limit the degree of potential noise-related impacts to wildlife species. First, the training tempo would not be intense overall. Assuming that day-to-day training occurs twice per week (although up to six times per week is possible), helicopters would typically operate at and near the HLZs and DZs for about one to four hours per week. Large force training exercises would add to the noise and human presence at the HLZs and DZs, but these activities would occur only twice per month on average. In addition, training exercises would rotate through different HLZs and DZs. Such a schedule reduces the likelihood that any given individual animal would be regularly exposed to substantial noise levels.

Impact Summary

Individuals may become habituated to training-related noise. In many studies, various species have demonstrated habituation to some degree. A substantial amount of hunting occurs in the areas in applicable seasons, so that gunfire is not a novel stimulus for at least some individuals. The likelihood of impacts would be reduced by the presumed tendency for at least some animals to move away from human presence and activity before loud noises occur.

In summary, anthropogenic noise would likely disturb wildlife species, resulting in various startle effects. Ground-burst simulator use could result in physiological effects such as hearing threshold shift if an animal were located near the noise source. Although it is possible that some individuals could avoid the HLZs and DZs long-term, in general, effects are expected to be temporary and not detrimental to overall wildlife populations. Large areas of similar habitat are available outside the affected area. Based on the significance thresholds identified in **Section 3.6**, there would be no significant impacts to biological resources at any of the HLZs or DZs associated with implementation of the Proposed Action.

4.5.3 No Action Alternative

Under the No Action Alternative, the HLZs and DZs would not be established. There would be no associated impacts to vegetation, wildlife, or protected species. There would be no change relative to existing conditions, and thus no significant impacts to biological resources as a result of the No Action Alternative.

4.6 SOCIOECONOMIC RESOURCES/ENVIRONMENTAL JUSTICE

4.6.1 Analysis Methodology

Socioeconomics

NEPA provides no specific thresholds of significance for socioeconomic impact assessment. Significance varies, depending on the setting of the proposed action (40 CFR 1508.27[a]), but 40 CFR 1508.8 states that indirect effects may include those that are growth inducing and others related to induced changes in the pattern of land use, population density, or growth rate.

Environmental Justice

The demographic profile of the region provides the context within which the environmental justice analysis was conducted. To determine whether environmental impacts would disproportionately affect minority or low-income populations, it is necessary to establish an appropriate basis of comparison. The basis is the “community of comparison” which consists of the geopolitical units that encompass the noise impact footprint of the proposed project. The environmental justice analysis therefore used this community of comparison to define the affected area. If there is a potential increase in the number of persons adversely affected by the 65 dB DNL and above noise contours, then a more detailed evaluation would be necessary. This would include estimating the percentage of minority and low-income persons that would be affected by the increased noise. A comparison is then made between these percentages and the ones previously calculated for the community of comparison to determine if there would be disproportionate effect under the noise contour due to the proposed activity. Locations of schools were also analyzed as noise-sensitive receptors.

4.6.2 Proposed Action

Socioeconomics

Under the Proposed Action, there would be no additional personnel or construction that would impact population, housing, or employment. The private owners of the proposed HLZ and DZ locations would benefit from any additional income associated with the leasing agreement with the Air Force.

In addition, usage of the land for HLZ and DZ as described under the Proposed Action would be compatible with current land uses and there would be no changes in land ownership, use, or management during the leasing agreement. Additionally, special considerations as identified in **Section 2.1** would be implemented as part of the Proposed Action and would minimize potential conflicts with land uses.

Environmental Justice

Under the Proposed Action, no residential structures would be affected by noise levels greater than 65 dB DNL. In addition, no residential areas would be exposed to peak noise levels above 140 dB PK 15[met], the level which poses a risk to hearing (see **Table 4-5**). As described in **Section 3.2**, Noise, there would be an increase in noise levels during HLZ and DZ training activities that would be expected to be annoying to certain nearby residents; however, no other impacts than annoyance are anticipated, and this would not be expected to be significant. Therefore, no disproportionate impacts to minority, low-income, or youth populations are

anticipated under the Proposed Action.

4.6.3 No Action Alternative

Under the No Action Alternative, socioeconomic resources would remain as described under baseline conditions. There would be no disproportionate impacts to environmental justice areas of concern.

4.7 CUMULATIVE EFFECTS

According to CEQ regulations, cumulative effects analysis should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects may occur when there is a relationship between a proposed action or alternative and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. The effects may then be incremental (increasing) in nature, resulting in cumulative impacts.

Actions overlapping with or in close proximity to a proposed action or alternative can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally tend to have a greater potential for cumulative effects.

Analysis was conducted by first identifying past, present, and reasonably foreseeable actions as related to the ROI for the particular resource. Cumulative impacts were then identified if the combination of proposed HLZ actions and past, present, and reasonably foreseeable actions were to interact with the resource to the degree that incremental or additive effects occur.

4.7.1 Relevant Past, Present, and Foreseeable Future Actions

Since there are no construction or land disturbing activities associated with the Proposed Action, actions most relevant to the cumulative impact analysis are associated with continued use of the proposed parcels by current landowners. Past, present, and reasonably foreseeable actions at these locations are generally continued use under current circumstances, which consist of silvicultural and recreational activities by the respective landowners.

4.7.2 Magnitude and Significance of Cumulative Effects

Noise

Noise levels beneath special use training airspace have increased slightly in recent years as a result of increases in sortie-operations tempo. This increase and resulting noise impacts are described in the EA Addressing the Expansion of Sortie-Operations at Moody AFB, GA (U.S. Air Force, 2012). Within the context of the special use training airspace, there would be no increase in sorties under the Proposed Action or associated overall increases in noise associated with the Proposed Action. Therefore, implementation of the Proposed Action would not incrementally contribute to the noise environment associated with other past, present, or reasonably foreseeable future actions within the ROI and no cumulative impacts have been identified.

Air Quality

Estimated emissions generated by the Proposed Action would be minor and below regulatory thresholds and would not contribute significantly to adverse cumulative effects on air quality. No past, present, or reasonably foreseeable projects have been identified that would have substantial cumulative effects on air quality when combined with the Proposed Action. Therefore, cumulative effects on air quality would be minor. No significant impacts would occur.

Water Resources

No significant cumulative impacts to water resources are expected because the Proposed Action will not significantly impact these resources. When combined with past, present, and future projects, adverse cumulative impacts are not expected because avoidance, minimization (BMPs), and mitigation measures would be employed for each project as directed by state and federal regulations.

Safety and Occupational Health

There would be no appreciable safety-related impacts associated with the Proposed Action; potential safety impacts are similar to those currently associated with training activities occurring within the ROI, and there would be no overall increase in training operations. Implementation of the Proposed Action would not incrementally contribute to safety impacts associated with other past, present, or reasonably foreseeable future actions within the ROI. Consequently, no cumulative impacts have been identified.

Hazardous Materials/Waste

No significant cumulative impacts due to hazardous materials/waste are expected because the Proposed Action will not utilize or create hazardous materials or hazardous wastes. Usage of training munitions is not designated as hazardous waste, and regular pickup following training activities will ensure no solid waste is generated. Minimal quantities of petroleum compounds may be released due to vehicle leakage, but such qualities would be easily mitigated through cleanup and would not exceed baseline conditions at the subject properties. Consequently, no cumulative impacts have been identified.

Biological/Natural Resources

There would be no significant cumulative impacts to biological resources resulting from the proposed actions. Establishment of three new HLZs and two DZs would not result in new training scenarios or increase the amount of training conducted by Moody AFB. Similar training occurs under existing conditions at other HLZs. The new HLZs and DZs would be established only to allow more realistic training and to alleviate scheduling conflicts. Although specific locations would differ, the types of biological resources potentially affected would be similar to those associated with current training. Implementation of the Proposed Action would not incrementally contribute to impacts associated with other past, present, or reasonably foreseeable future actions within the ROI, such as hunting or agricultural use, and no cumulative impacts to biological resources have been identified.

Cultural Resources

No significant cumulative impacts to cultural resources are expected because the Proposed Action will not impact these resources. When combined with past, present, and future projects, adverse cumulative impacts are not expected because avoidance, minimization, and mitigation measures would be employed for each project as directed by state and federal regulations.

Earth Resources

No significant cumulative impacts to earth resources are expected because the Proposed Action will not impact these resources. When combined with past, present, and future projects, adverse cumulative impacts are not expected because avoidance, minimization, and mitigation measures would be employed for each project as directed by state and federal regulations.

Land Use

There would be no changes to land use or incompatible uses associated with the Proposed Action. As a result, implementation of the Proposed Action would not incrementally contribute to impacts associated with other past, present, or reasonably foreseeable future actions within the ROI and no cumulative impacts to land use have been identified.

Socioeconomic Resources/Environmental Justice

No impacts to socioeconomic resources or environmental justice areas of concern have been identified. Therefore, implementation of the Proposed Action would not incrementally contribute to socioeconomic/environmental justice impacts associated with other past, present, or reasonably foreseeable future actions within the ROI and no cumulative impacts have been identified.

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5.0 LIST OF PREPARERS

Name/Organization	Degree	Contribution	Years of Experience
Eric Rider Nicklaus Engineering, Inc.	B.S. Environmental and Resource Science M.S. Soils and Biogeochemistry	Project Manager	17
Jonathan Bourdeau, Wood E&IS, Inc.	B.S. Forest Resources M.S. Management Science	Primary Author/ NEPA Specialist	22
Brian Cook Wood E&IS, Inc.	B.A. Biology	Senior Noise Analyst	22
Sean Mulligan Wood E&IS, Inc.	B.S. Mechanical Engineering	Senior Air Quality Analyst	28
Josh Sandige Nicklaus Engineering, Inc.	B.S. Environmental Science	Project Scientist	3
Richard Harmon Wood E&IS, Inc.	B.S. Marine Biology M.S. Coastal Ecology	Senior Technical Reviewer	33

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6.0 PERSONS AND AGENCIES CONSULTED/COORDINATED

Name	Title / Responsibility
Lorence Busker	Moody AFB Project Manager
Gregory Lee	Moody AFB Natural/Cultural Resources Manager
MSgt John Rosenberg	347 OSS/OSK Tactics Superintendent
Maj Dirksen	347 OSS/OSK HH-60 Pilot
Lt Col Cuddy	347 OSS/OSK Commander
Ron Durbin	23 CES/CEIAP
Stevie Wells	23 CES/CEIAP
Landowner	Atkinson County HLZ/DZ Landowner
Landowner	Echols County HLZ/DZ Landowner
Landowner	Clinch County HLZ/DZ Landowner
Landowner	Columbia County HLZ/DZ Landowner
U.S. Fish and Wildlife Service, Georgia	
U.S. Fish and Wildlife Service, Florida	
Division of Historical Resources, Florida	
Florida Fish and Wildlife Conservation Commission	
Georgia Environmental Protection Division	
Georgia Wildlife Resources Division	
Georgia Department of Community Affairs	
Georgia Department of Transportation	
South Georgia Regional Planning Council	
Lanier County Commission	
Lowndes County Commission	
Lowndes County Planner	
Lowndes County Manager	
Columbia County Commission	
Columbia County Courthouse	
Seminole Nation of Oklahoma	
Coushatta Tribe of Louisiana	
Muscogee Nation of Florida	
Kialegee Tribal Town	
Thlopthlocco Tribal Town	
Muscogee (Creek) Nation	
Poarch Band of Creek Indians	

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7.0 REFERENCES

Air Force Instruction (AFI). 2017. 13-217, Drop Zone and Landing Zone Operations. 10 May 2007. Accessed 20 December 2021.

American National Standard Institute (ANSI). 2013. Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present.

Bies and Hansen. 1988. Engineering Noise Control.

Code of Federal Regulations (CFR). 2021. Title 14 Code of Federal Regulations (CFR) Part 77, Subpart C, Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities. 9 December 2021.

Code of Federal Regulations (CFR). 2022. Title 14 Code of Federal Regulations (CFR) Part 261.3, Identification and Listing of Hazardous Waste, Subpart A, Definition of Hazardous Waste. 26 April 2022.

Code of Federal Regulations (CFR). 2022. Title 14 Code of Federal Regulations (CFR) Part 266.3, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities Subpart M, Definition of Hazardous Waste. 26 April 2022.

Council on Environmental Quality (CEQ). 1997. Guidance under the National Environmental Policy Act. Access 23 March 2020. Retrieved from: https://www.epa.gov/sites/production/files/201502/documents/ej_guidance_npea_ceq1297.pdf

Federal Aviation Administration (FAA). 2015. FAA Order 1050.1F Desk Reference. Federal Aviation Administration Office of Environment and Energy. July.

Federal Interagency Committee on Noise . 1992. Federal Agency Review of Selected Airport Noise Analysis Issues. August.

Florida Fish and Wildlife Conservation Commission (FWCC). 2021. Florida's Endangered and Threatened Species. June. Online at https://myfwc.com/media/1945/threatened-endangered-species.pdf.

Florida Natural Areas Inventory (FNAI). 2022. Biodiversity Matrix Query Results. 4 February 2022.

Georgia Department of Natural Resources (GADNR). 2022. Wildlife Resources Division. 3 March 2022. Accessed online at: georgiabiodiversity.org/portal/natural_locations/swap-sgcn

Harris, C. M. 1998. Handbook of Acoustical Measurements and Noise Control.

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. U.S. Fish and Wildlife Service National Ecology Research Center, Fort Collins, Colorado. NERC-88/29. 88 pp.

Moody Air Force Base (AFB). 2013. Final Environmental Assessment for Expansion of Off-Base Helicopter Landing Zones at Moody Air Force Base, Georgia. December.

Moody AFB. 2015. Air Installation Compatible Use Zone Study (AICUZ). 9 July 2015.

Moody AFB. 2022. Noise modeling utilizing NOISEMAP Version 7.3 based on the 2020 Draft Environmental Impact Statement, Moody Air Force Base Comprehensive Airspace Initiative and data collection via email with Moody AFB personnel.

NoiseQuest. 2013. https://www.noisequest.psu.edu/.

Notices to Airmen (NOTAM). 2019. Federal Aviation Administration Order 7930.2S, Notices to Airmen (NOTAM). https://www.faa.gov/documentLibrary/media/Order/7930.2S_Bsc_w-_Chg_1_Chg_2_dtd_12_2_21.pdf. 10 January 2019. Accessed 20 December 2021.

Occupational Safety and Health Administration (OSHA). 1983. Occupational Noise Exposure Standard. Code of Federal Regulations Title 29, Part 1910, Sec. 1910.95 (29 CFR 1910.95).

QPublic.net (qPublic). 2022. Local Government GIS for the Web. Data sourced from Atkinson County Board of Assessors, Clinch County Tax Assessor's Office, Echols County Tax Assessor's Office, and Echols County Tax Assessor's Office. Accessed online at: https://qpublic.schneidercorp.com/

SkyVector. 2022. SkyVector Online Aeronautical Chart, World VFR. Accessed online at: https://skyvector.com/.

U.S. Air Force. 2012. Environmental Assessment Addressing the Expansion of Sortie-Operations at Moody Air Force Base, Georgia. August.

U.S. Air Force. 2015. Air Force Instruction (AFI) 32-7063. Air Installations Compatible Use Zones Program.

U.S. Air Force. 2016. Air Force Instruction 32-7070, Air Force Noise Program.

U.S. Air Force. 2020. Draft Environmental Impact Statement, Moody Air Force Base Comprehensive Airspace Initiative. September.

U.S. Army (Army). 2007. Army Regulation (AR) 200-1, Environmental Protection and Enhancement, Chapter 14, Operational Noise.

U.S. Census Bureau (USCB). 2022a. QuickFacts - Atkinson County, Georgia. Accessed online at: https://www.census.gov/quickfacts/fact/table/atkinsoncountygeorgia/-PST045221

U.S. Census Bureau (USCB). 2022b. B01001 SEX BY AGE, 2020 American Community Survey 5-Year Estimates. U.S. Census Bureau, American Community Survey Office. Accessed online at: http://www.census.gov/.

U.S. Census Bureau (USCB). 2022c. QuickFacts - Clinch County, Georgia. Accessed online at: https://www.census.gov/quickfacts/fact/table/clinchcountygeorgia/-PST045221

U.S. Census Bureau (USCB). 2022d. QuickFacts - Columbia County, Florida. Accessed online at: https://www.census.gov/quickfacts/fact/table/columbiacountyflorida/-PST045221

U.S. Census Bureau (USCB). 2022e. QuickFacts - Echols County, Georgia. Accessed online at: https://www.census.gov/quickfacts/fact/table/echolscountygeorgia/-PST045221

U.S. Census Bureau (USCB). 2022f. QuickFacts - Florida. Accessed online at: https://www.census.gov/quickfacts/FL

U.S. Census Bureau (USCB). 2022g. QuickFacts - Georgia. Accessed online at: https://www.census.gov/quickfacts/GA

U.S Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With An Adequate Margin of Safety. March.

USEPA. 2022. “Current Nonattainment Counties for All Criteria Pollutants-- Green Book.” 2022. https://www3.epa.gov/airquality/greenbook/ancl.html.

U.S. Fish & Wildlife Service Information for Planning and Consultation (USFWS IPaC). 2022. 4 February 2022. Accessed online at: Ipac.ecosphere.fws.gov

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APPENDICES

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Appendix A: Public, Tribal, and Agency Reviews, Comments, and Consultations

Consultation letters were submitted to the following Tribal and Government agencies. Any comments received from consultations will be included in the Final EA.

Tribal Coordination

- Alabama Coushatta Tribe of Texas
- Alabama-Quassarte Tribal Town
- Caddo Nation
- Cherokee Nation
- Choctaw Nation of Oklahoma
- Coushatta Tribe of Louisiana
- Kialegee Tribal Town
- Mississippi Band of Choctaw Indians
- Muscogee (Creek) Nation
- Muscogee Nation of Florida
- Poarch Band of Creeks
- Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee Indians

Intergovernmental/Interagency Coordination of Environmental Planning (IICEP) Coordination

- Columbia County Commission
- Columbia County Commission
- Lanier County Commission
- Lowndes County Commission
- Lowndes County Commission
- Lowndes County Commission
- Southern Georgia Regional Commission
- Georgia Department Of Community Affairs
- Georgia Department Of Natural Resources
- Georgia Department Of Transportation
- Georgia Ecological Services
- Georgia Environmental Protection Division
- Florida Ecological Services
- Florida Fish & Wildlife Conservation Commission
- Florida Division Of Historical Resources
- Jewett Center For Historic Preservation
- U.S. Fish And Wildlife Service
- U.S. Fish And Wildlife Service

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Appendix B: Noise Analysis

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Appendix B:
Noise Analysis

Flight Profile Operations Summary

Based UH60A Aircraft with T700-CE-700 Engine

Closed Patterns

Profile	Track	Day	Night	Total
HH60_1mile_E	1mileE	4.800	1.200	6.000
HH60_1mile_N	1mileN	4.800	1.200	6.000
HH60_1mile_S	1mileS	4.800	1.200	6.000
HH60_1mile_W	1mileW	4.800	1.200	6.000
HH60_2mile_E	2mileE	1.600	0.400	2.000
HH60_2mile_N	2mileN	1.600	0.400	2.000
HH60_2mile_S	2mileS	1.600	0.400	2.000
HH60_2mile_W	2mileW	1.600	0.400	2.000
	Total:	25.600	6.400	32.000
	Runway 75_DZ_HLZ_E1:	25.00%	25.00%	25.00%
	Runway 75_DZ_HLZ_N1:	25.00%	25.00%	25.00%
	Runway 75_DZ_HLZ_S1:	25.00%	25.00%	25.00%
	Runway 75_DZ_HLZ_W1:	25.00%	25.00%	25.00%
	Total:	80.00%	20.00%	

Summary of Based Aircraft Operations

Closed Patterns

	Day	Night	Total
Total:	25.600	6.400	32.000
Runway 75_DZ_HLZ_E1:	25.00%	25.00%	25.00%
Runway 75_DZ_HLZ_N1:	25.00%	25.00%	25.00%
Runway 75_DZ_HLZ_S1:	25.00%	25.00%	25.00%
Runway 75_DZ_HLZ_W1:	25.00%	25.00%	25.00%
Total:	80.00%	20.00%	

Flight Profile Details

HH60_1mile_E

Notes
Day Ops 4.8
Night Ops 1.2
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_E1
Track 1mileE
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.28	80 AGL	Lfo Load 70 kts
d	2.07	100 AGL	Lfo Load 70 kts
e	2.69	100 AGL	Lnd Load 40 kts
f	4.14	20 AGL	Lnd Load 40 kts

HH60_1mile_N

Notes
Day Ops 4.8
Night Ops 1.2
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_N1
Track 1mileN
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.28	80 AGL	Lfo Load 70 kts
d	2.07	100 AGL	Lfo Load 70 kts
e	2.69	100 AGL	Lnd Load 40 kts
f	4.14	20 AGL	Lnd Load 40 kts

HH60_1mile_S

Notes
Day Ops 4.8
Night Ops 1.2
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_S1
Track 1mileS
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.28	80 AGL	Lfo Load 70 kts
d	2.07	100 AGL	Lfo Load 70 kts
e	2.69	100 AGL	Lnd Load 40 kts
f	4.14	20 AGL	Lnd Load 40 kts

HH60_1mile_W

Notes
Day Ops 4.8
Night Ops 1.2
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_W1
Track 1mileW
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.28	80 AGL	Lfo Load 70 kts
d	2.07	100 AGL	Lfo Load 70 kts
e	2.69	100 AGL	Lnd Load 40 kts
f	4.14	20 AGL	Lnd Load 40 kts

HH60_2mile_E

Notes
Day Ops 1.6
Night Ops 0.4
Aircraft UH60A
Engine T700-CE-700
A/C Category Based

Runway/Pad 75_DZ_HLZ_E1
Track 2mileE
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.50	80 AGL	Lfo Load 70 kts
d	4.00	100 AGL	Lfo Load 100 kts
e	6.00	100 AGL	Lfo Load 70 kts
f	9.00	50 AGL	Lnd Load 40 kts
g	10.28	20 AGL	Lnd Load 40 kts

HH60_2mile_N

Notes
Day Ops 1.6
Night Ops 0.4
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_N1
Track 2mileN
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.50	80 AGL	Lfo Load 70 kts
d	4.00	100 AGL	Lfo Load 100 kts
e	6.00	100 AGL	Lfo Load 70 kts
f	9.00	50 AGL	Lnd Load 40 kts
g	10.28	20 AGL	Lnd Load 40 kts

HH60_2mile_S

Notes
Day Ops 1.6
Night Ops 0.4
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_S1
Track 2mileS
Runup Time ----

Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.50	80 AGL	Lfo Load 70 kts
d	4.00	100 AGL	Lfo Load 100 kts
e	6.00	100 AGL	Lfo Load 70 kts
f	9.00	50 AGL	Lnd Load 40 kts
g	10.28	20 AGL	Lnd Load 40 kts

HH60_2mile_W

Notes
Day Ops 1.6
Night Ops 0.4
Aircraft UH60A
Engine T700-CE-700
A/C Category Based
Runway/Pad 75_DZ_HLZ_W1
Track 2mileW
Runup Time ----
Takeoff Displacement 0 ft
Landing Displacement 0 ft
Profile Segments

Point	Distance NM	Height ft	Power KNOTS
a	0.00	20 AGL	Lnd Load 40 kts
b	0.50	40 AGL	Tkf Load 40 kts
c	1.50	80 AGL	Lfo Load 70 kts
d	4.00	100 AGL	Lfo Load 100 kts
e	6.00	100 AGL	Lfo Load 70 kts
f	9.00	50 AGL	Lnd Load 40 kts
g	10.28	20 AGL	Lnd Load 40 kts

Static Pad Summary

Name	Location	Elevation ft
HOVER15	lat: 30° 39.3579' N long: 82° 52.1901' W	15
HOVER35	lat: 30° 39.3579' N long: 82° 52.1901' W	35
HOVER45	lat: 30° 39.3579' N long: 82° 52.1901' W	45
HOVER75	lat: 30° 39.3579' N long: 82° 52.1901' W	75
WHEELSDOWN	lat: 30° 39.3579' N long: 82° 52.1901' W	0

Static Profile Summary

Name	Aircraft	Engine	Suppressor	Pad	Heading ° mag
HOVER_15_12	UH60A	T700-CE-700	NONE	HOVER15	0
HOVER_35_12	UH60A	T700-CE-700	NONE	HOVER35	0
HOVER_45_12	UH60A	T700-CE-700	NONE	HOVER45	0
HOVER_75_12	UH60A	T700-CE-700	NONE	HOVER75	0
WHEELSDOWN_12	UH60A	T700-CE-700	NONE	WHEELSDOWN	0

Static Profile Details

HOVER_15_12

Notes
Aircraft UH60A
Engine T700-CE-700
Suppressor NONE
Pad HOVER15
Heading 0° mag
Profile Segments

Power POWER	Day Ops	Night Ops	Duration sec	Number Engines
Ige Load	1.6	0.4	720	1

HOVER_35_12

Notes
Aircraft UH60A
Engine T700-CE-700
Suppressor NONE
Pad HOVER35
Heading 0° mag
Profile Segments

Power POWER	Day Ops	Night Ops	Duration sec	Number Engines
Ige Load	1.6	0.4	720	1

HOVER_45_12

Notes
Aircraft UH60A
Engine T700-CE-700
Suppressor NONE
Pad HOVER45
Heading 0° mag
Profile Segments

Power POWER	Day Ops	Night Ops	Duration sec	Number Engines
Ige Load	1.6	0.4	720	1

HOVER_75_12

Notes
Aircraft UH60A
Engine T700-CE-700
Suppressor NONE

Pad HOVER75
Heading 0° mag

Profile Segments	Power POWER	Day Ops	Night Ops	Duration sec	Number Engines
	Ige Load	1.6	0.4	720	1

WHEELSDOWN_12

Notes
Aircraft UH60A
Engine T700-CE-700
Suppressor NONE
Pad WHEELSDOWN
Heading 0° mag

Profile Segments	Power POWER	Day Ops	Night Ops	Duration sec	Number Engines
	Idl	1.6	0.4	720	1

7.62 MOODY HH60.TXT

```
7.62 MOODY HH60.DAT
202205021327
Case file display
#
# Receiver Grid Selection = HH-60
# Metric Selection = PEAK, FLAT
# Activity Table Selection = 7.62 HH60 MOODY
#
RANGE
MOODY HH60 A
# HH60 MOODY
# US AIR FORCE
# GA
# USA
# BCOOK
UTM GRID ZONE NUMBER
17
#
# Firing point #1, full (to 1 m) UTM easting, northing and height
FRPT1
320791
3393000
150
#
# This is the azimuth from the first firing point to the first
# target, measured in degrees clockwise from the grid north
GRDAZ (deg)
90
#
# Distance in meters from firing point to target
TARDIS (m)
50
#
# This is the number of shooting lanes
LANNUM
1
#
# This is the spacing of between shooting lane centers in meters
LANSPC (m)
1
#
#
#
END RANGE
#
#
RECEIVER GRID
# HH60 MOODY
# US AIR FORCE
# GA
```

```
# USA
# BCOOK
SOUTHWEST CORNER
314000
3388000
OVERALL GRID SIZE (m) EAST-WEST
5000
OVERALL GRID SIZE (m) NORTH-SOUTH
5000
GRID RESOLUTION (m)
10
END_RECEIVER_GRID
#
#
WEAPONS_AND_AMMUNITION
WEAPON NAME/AMMO NAME
MG M60 7.62 mm / blank
# The following are the gun spectra
# SEL=a+b*x+c*x^2
# x=cos(off-axiz angle)
# BAND  a       b       c
FIT COEFICIENTS
0       -100    0       0
1       -100    0       0
2       -100    0       0
3       -100    0       0
4       -100    0       0
5       -100    0       0
6       -100    0       0
7       -100    0       0
8       -100    0       0
9       -100    0       0
10      90.8600006103516        -0.230000004172325      4.15000009536743
11      92.1999969482422        -0.150000005960464      3.95000004768372
12      94.0500030517578        -0.0299999993294477     3.67000007629395
13      94.8600006103516        0.140000000596046       3.33999991416931
14      96.4000015258789        0.349999994039536       2.98000001907349
15      98.3000030517578        0.620000004768372       2.57999992370605
16      100.059997558594        0.949999988079071       2.16000008583069
17      101.440002441406        1.30999994277954        1.76999998092651
18      103.569999694824        1.70000004768372        1.4099999666214
19      105.309997558594        2.09999990463257        1.05999994277954
20      106.459999084473        2.47000002861023        0.779999971389771
21      107.709999084473        2.83999991416931        0.579999983310699
22      108.949996948242        3.52999997138977        0.569999992847443
23      108.830001831055        5.03999996185303        0.639999985694885
24      110.629997253418        6.40999984741211        -0.300000011920929
25      113.400001525879        5.48000001907349        -0.5
26      114.540000915527        5.21000003814697        0.280000001192093
27      115.459999084473        6.07000017166138        -1.00999999046326
```

```
28      115.98999786377 5.53999996185303        -1.12000000476837
29      113.629997253418        4.03999996185303        -2.10999989509583
30      112.470001220703        4.46000003814697        -7.17999982833862
31      112.459999084473        5.8600001335144 -3.29999995231628
32      110.599998474121        6.01999998092651        -3.17000007629395
33      108.870002746582        6.48999977111816        -4.01000022888184
34      108.919998168945        7.01999998092651        -5.86999988555908
35      106.949996948242        5.65000009536743        -1.50999999046326
36      105.139999389648        6.28999996185303        -1.54999995231628
37      103.290000915527        6.6399998664856 -2.50999999046326
38      103.080001831055        7.32999992370605        -3.60999989509583
39      102.160003662109        7.1399998664856 -1.79999995231628
40      102.5   5.78999996185303        0.620000004768372
41      -100    0       0
42      -100    0       0
43      -100    0       0
BULLET SPEED (m/s) AND SPEED AT 100m (m/s)
0       0
BULLET DIAMETER (mm)
7.82000017166138
BULLET LENGTH (mm)
26
BULLET MASS (g)
9.72000026702881
END MG M60 7.62 mm / blank
#
END_WEAPONS_AND_AMMUNITION
#
#
ACTIVITY_FOR_EACH_RANGE
RANGE NAME
MOODY HH60 A
WEAPON&AMMO
MG M60 7.62 mm / blank
DAY RNDS
100
% DAY RAPID FIRE
0
NIGHT RNDS
0
% NIGHT RAPID FIRE
0
#
END_ACTIVITY
#
#
METRICS_AND_PENALTIES
NOISE_EXPOSURE_METRIC
MXPK
ASSESSMENT_PERIOD_(h)
```

```
 0.00000000000000E+0000
IMPULSIVENESS_PENALTY
 1.20000000000000E+0001
SILENCE_THRESHOLD_(dB)
-1.00000000000000E+0002
SILENCE_METRIC_NAME
LE
END_METRICS_AND_PENALTIES
#
#
FREQUENCY_WEIGHTING
FLAT
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
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0
0
0
0
0
```

```
0
0
0
0
0
0
END_FREQUENCY_WEIGHTING
#
#
```

MOODY GBS.TXT

```
CASE_BCALC_v1.x

begin_description

  #Date/Time Created: 2 May 2022 14:04
  #Case File Name: C:\BNOISE2\Cases\MOODY GBS.dat
  #BNOISE2 v1.3.2003-07-03

  #
  # Receiver Grid Selection = MOODY HH60
  # Metric Selection = PK, 10, NO WEIGHTING
  # Activity Selection = MOODY HH60 GBS
  # Include Terrain: False
  # Include Land-Water: False
  #

  # Installation Name: MOODY HH60
  # Service: US AIR FORCE
  # State: GA
  # Country: USA
  # Author: BCOOK
  # Date Created: 2 May 2022
  # Date Last Modified: 2 May 2022

end_description


begin_bcalccommands

  # This section is for diagnostic purposes only
Draw Firing Areas: .true.
Draw Target Areas: .true.
Draw Trajectories: .true.
Draw Registration Marks: .true.
Write Annotations: .true.
Calculate Contour Grid: .true.

end_bcalccommands


begin_sound_propagation_types

Propagation Directory Name: C:\BNOISE2\support\

Propagation Type: BN3.2 DAY FOCUS
Downwind Table: noloss
Downwind Corrections: dfocus.st
Upwind Table: noloss
Upwind Corrections: dfocus.st
  # Date Created: 7 Jun 1999
```

```
  # Date Last Modified: 7 Jun 1999

Propagation Type: BN3.2 DAY BASE
Downwind Table: noloss
Downwind Corrections: dbase.st
Upwind Table: noloss
Upwind Corrections: dbase.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999

Propagation Type: BN3.2 DAY NEGATIVE GRADIENT
Downwind Table: noloss
Downwind Corrections: dneg.st
Upwind Table: noloss
Upwind Corrections: dneg.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999

Propagation Type: BN3.2 DAY EXCESS NEGATIVE GRADIENT
Downwind Table: noloss
Downwind Corrections: dexneg.st
Upwind Table: noloss
Upwind Corrections: dexneg.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999

Propagation Type: BN3.2 NIGHT FOCUS
Downwind Table: noloss
Downwind Corrections: nfocus.st
Upwind Table: noloss
Upwind Corrections: nfocus.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999

Propagation Type: BN3.2 NIGHT BASE
Downwind Table: noloss
Downwind Corrections: nbase.st
Upwind Table: noloss
Upwind Corrections: nbase.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999

Propagation Type: BN3.2 NIGHT NEGATIVE GRADIENT
Downwind Table: noloss
Downwind Corrections: nneg.st
Upwind Table: noloss
Upwind Corrections: nneg.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999
```

```
Propagation Type: BN3.2 NIGHT EXCESS NEGATIVE GRADIENT
Downwind Table: noloss
Downwind Corrections: nexneg.st
Upwind Table: noloss
Upwind Corrections: nexneg.st
  # Date Created: 7 Jun 1999
  # Date Last Modified: 7 Jun 1999


end_sound_propagation_types


begin_propagation_occurrence_by_azimuth

Propagation Type: BN3.2 DAY FOCUS
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 5
Nighttime Occurrence (pct): 0
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 DAY BASE
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 25.4
Nighttime Occurrence (pct): 0
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 DAY NEGATIVE GRADIENT
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 40.8
Nighttime Occurrence (pct): 0
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 DAY EXCESS NEGATIVE GRADIENT
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 28.8
Nighttime Occurrence (pct): 0
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 NIGHT FOCUS
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 0
Nighttime Occurrence (pct): 5.6
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 NIGHT BASE
```

```
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 0
Nighttime Occurrence (pct): 33.9
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 NIGHT NEGATIVE GRADIENT
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 0
Nighttime Occurrence (pct): 28.8
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999

Propagation Type: BN3.2 NIGHT EXCESS NEGATIVE GRADIENT
Propagation Azimuth (deg): 0
Daytime Occurrence (pct): 0
Nighttime Occurrence (pct): 32
  # Date Created: 9 Aug 1999
  # Date Last Modified: 9 Aug 1999


end_propagation_occurrence_by_azimuth


begin_receivergrid

Receiver Grid Name: MOODY HH60
UTM Zone: 17
SW Corner Easting: 314000.00
SW Corner Northing: 3388000.00
EW Overall Size: 5000
NS Overall Size: 5000
Mesh Spacing: 10
  # Installation Name: MOODY HH60
  # Service: US AIR FORCE
  # State: GA
  # Country: USA
  # Author: BCOOK
  # Date Created: 2 May 2022
  # Date Last Modified: 2 May 2022

end_receivergrid


begin_maps

  #Land-Water XYW Map File Name: None
  #Terrain XYZ Map File Name: None

end_maps
```

```
begin_firingareas

Firing Area Name: MOODY HH60 FA_POINT_POINT
UTM Zone: 17
East1: 320791.00
North1: 3393000.00
Percent1: 100.00
Elevation: 50.00
  # Easting: 320791.00
  # Northing: 3393000.00
  # EastWest Size: 0.00
  # NorthSouth Size: 0.00
  # Azimuth: 0.00
  # Installation Name: MOODY HH60
  # Service: US AIR FORCE
  # State: GA
  # Country: USA
  # Author: BCOOK
  # Date Created: 2 May 2022
  # Date Last Modified: 2 May 2022

end_firingareas


begin_targetareas

end_targetareas


begin_equivalentyields

Equivalent Yield Name: TNT
Pressure Equivalent TNT Multiple: 1.0000
Impulse Equivalent TNT Multiple: 1.0000
  # Description: M.M. Swisdak NSWC TR-75-116; ANSI S2.20-1983
  # Date Created: 1 Jan 1998
  # Date Last Modified: 1 Jan 1998

end_equivalentyields


begin_cselacousticefficiencies

end_cselacousticefficiencies


begin_directivityspectra
```

```
end_directivityspectra


begin_cseldirectivities

end_cseldirectivities


begin_noisesources

Noise Source Code: DTN01
Weapon Class: EXPLOSIVE
  # Weapon Type: DEMOLITION
  # Weapon: TNT
  # Charge Increment: 0.25 LBS
Explosive Charge Weight (kg): 0.1134
  # Charge Increment Description:
Equivalent Yield: TNT
  # Noise Source Description:
  # Date Created: 10 Feb 2002
  # Date Last Modified: 10 Feb 2002

end_noisesources


begin_activitydetails

Detail Record Number: 1
Firing Area: MOODY HH60 FA_POINT_POINT
Firing Noise Source: DTN01
Firing Height: 50.00
Target Area:
  # This Acitivty Detail uses no Target Area
Number of Day Shots: 2.00000000
Number of Night Shots: 0.00000000
  # Activity Detail Date:
  # Activity Detail Description:
  # Date Created: 2 May 2022
  # Date Last Modified: 2 May 2022

end_activitydetails


begin_frequencyweighting

Frequency Weighting Name: NO WEIGHTING
Band 0: 0.00
Band 1: 0.00
Band 2: 0.00
Band 3: 0.00
```

```
Band 4: 0.00
Band 5: 0.00
Band 6: 0.00
Band 7: 0.00
Band 8: 0.00
Band 9: 0.00
Band 10: 0.00
Band 11: 0.00
Band 12: 0.00
Band 13: 0.00
Band 14: 0.00
Band 15: 0.00
Band 16: 0.00
Band 17: 0.00
Band 18: 0.00
Band 19: 0.00
Band 20: 0.00
Band 21: 0.00
Band 22: 0.00
Band 23: 0.00
Band 24: 0.00
Band 25: 0.00
Band 26: 0.00
Band 27: 0.00
Band 28: 0.00
Band 29: 0.00
Band 30: 0.00
Band 31: 0.00
Band 32: 0.00
Band 33: 0.00
Band 34: 0.00
Band 35: 0.00
Band 36: 0.00
Band 37: 0.00
Band 38: 0.00
Band 39: 0.00
Band 40: 0.00
Band 41: 0.00
Band 42: 0.00
Band 43: 0.00

end_frequencyweighting


begin_metrics

Metric Name: PK, 10
Frequency Weighting: NO WEIGHTING
Contour Metric: PK
Silence Threshold: 0.00
```

```
Assessment Period (h): 0.000277777813607827
Exceedance Percent (pct): 10.00
  # Date Created: 12 Aug 1999
  # Date Last Modified: 12 Aug 1999

end_metrics
```

MOODY_HLZ_DZ - BASELINE - MRNMap.LOG

```
                  ***** MOA RANGE NOISEMAP *****
                           Version  3.0
                        Release Date      2/7/2013

                              CASE INFORMATION
  Case Name:MOODY HLZ_LZ 2022 - Baseline Scenario

  Site Name:Moody AFB


                              SETUP PARAMETERS
  Number of MOAs and Ranges =  2     Number of tracks = 0
  Lower Left  Corner of Grid in feet (X Y pair) =  -143103.,  -174353.
  Upper Right Corner of Grid in feet (X Y pair) =   106647.,   137897.
  Grid spacing =      250. feet      Number of events above an SEL  of 65.0 dB
  Temperature =  59 F      Humidity =  70     Flying days per month = 30


                            MOA SPECIFICATIONS

  MOA name MOA US 01746_M2N
       Lat       Long
      (deg)      (deg)
    31.30028   -82.85000
    31.23361   -82.81667
    31.02667   -82.65000
    30.95028   -82.65000
    30.95028   -83.01667
    31.35028   -83.01667
    31.30028   -82.85000
  Floor =     500 feet AGL     Ceiling =    7849 feet AGL

  MOA name MOA US 01748_M2S
       Lat       Long
      (deg)      (deg)
    30.95028   -83.01667
    30.95028   -82.65000
    30.58333   -82.65000
    30.60305   -83.01667
    30.95028   -83.01667
  Floor =     100 feet AGL     Ceiling =    7849 feet AGL


                    SPECIFIC POINT SPECIFICATION
  Number of Specific points =  5
   Latitude    Longitude       Name
    30.71178   -82.86529     11 HLZ
    30.65596   -82.86989     75.8 HLZ_DZ
    30.58408   -82.52271     L2-A HLZ
    30.84788   -82.88462     L3-2 DZ
```

31.20534 -82.97472 L4-3 HLZ

MISSION DATA

Mission name = A10_M2N_1
Aircraft code =FM0090100 Speed = 180 kias Power = 86.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	5.0
3000	5000	30.0
5000	7849	60.0

Mission name = A10_M2N_2
Aircraft code =FM0090101 Speed = 250 kias Power = 93.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	5.0
3000	5000	30.0
5000	7849	60.0

Mission name = A10_M2N_3
Aircraft code =FM0090102 Speed = 350 kias Power = 97.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	5.0
3000	5000	30.0
5000	7849	60.0

Mission name = A10_M2S_1
Aircraft code =FM0090100 Speed = 180 kias Power = 86.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	5.0
3000	5000	30.0
5000	7849	60.0

Mission name = A10_M2S_2
Aircraft code =FM0090101 Speed = 250 kias Power = 93.0

```
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


 Mission name = A10_M2S_3
 Aircraft code =FM0090102  Speed =  350 kias  Power =    97.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


 Mission name = A29_M2N_1
 Aircraft code =FM0870100  Speed =  120 kias  Power =    30.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


 Mission name = A29_M2N_2
 Aircraft code =FM0870101  Speed =  180 kias  Power =    55.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


 Mission name = A29_M2N_3
 Aircraft code =FM0870102  Speed =  220 kias  Power =   100.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
```

```
       5000         7849        60.0


  Mission name = A29_M2S_1
  Aircraft code =FM0870100  Speed =  120 kias  Power =    30.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


  Mission name = A29_M2S_2
  Aircraft code =FM0870101  Speed =  180 kias  Power =    55.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


  Mission name = A29_M2S_3
  Aircraft code =FM0870102  Speed =  220 kias  Power =   100.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000         5.0
       3000          5000        30.0
       5000          7849        60.0


  Mission name = C130_M2N_1
  Aircraft code =FM0290400  Speed =  150 kias  Power =   800.0
            Altitude Distribution
     Lower Alt    Upper Alt     Percent
    (feet AGL)   (feet AGL)   Utilization
        500          1000         5.0
       1000          3000        15.0
       3000          5000        30.0
       5000          7849        50.0


  Mission name = C130_M2N_2
  Aircraft code =FM0290401  Speed =  220 kias  Power =  1800.0
            Altitude Distribution
```

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	15.0
3000	5000	30.0
5000	7849	50.0

Mission name = C130_M2N_3
Aircraft code =FM0290402 Speed = 250 kias Power = 4700.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	15.0
3000	5000	30.0
5000	7849	50.0

Mission name = C130_M2S_1
Aircraft code =FM0290400 Speed = 150 kias Power = 800.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	15.0
3000	5000	30.0
5000	7849	50.0

Mission name = C130_M2S_2
Aircraft code =FM0290401 Speed = 220 kias Power = 1800.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	15.0
3000	5000	30.0
5000	7849	50.0

Mission name = C130_M2S_3
Aircraft code =FM0290402 Speed = 250 kias Power = 4700.0
Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	15.0
3000	5000	30.0
5000	7849	50.0

Mission name = F18_M2N
Aircraft code =FM0450100 Speed = 350 kias Power = 80.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	5.0
3000	5000	10.0
5000	7849	80.0

Mission name = F18_M2S
Aircraft code =FM0450100 Speed = 350 kias Power = 80.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	5.0
1000	3000	5.0
3000	5000	10.0
5000	7849	80.0

Mission name = H60_M2N_1
Aircraft code =FM6210100 Speed = 70 kias Power = 0.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	25.0
1000	3000	70.0
3000	5000	5.0

Mission name = H60_M2N_2
Aircraft code =FM6210101 Speed = 100 kias Power = 0.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	25.0
1000	3000	70.0
3000	5000	5.0

Mission name = H60_M2N_3
Aircraft code =FM6210102 Speed = 140 kias Power = 0.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	25.0

1000	3000	70.0
3000	5000	5.0

Mission name = H60_M2S_1
Aircraft code =FM6210100 Speed = 70 kias Power = 0.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	25.0
1000	3000	70.0
3000	5000	5.0

Mission name = H60_M2S_2
Aircraft code =FM6210101 Speed = 100 kias Power = 0.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	25.0
1000	3000	70.0
3000	5000	5.0

Mission name = H60_M2S_3
Aircraft code =FM6210102 Speed = 140 kias Power = 0.0

Altitude Distribution

Lower Alt (feet AGL)	Upper Alt (feet AGL)	Percent Utilization
500	1000	25.0
1000	3000	70.0
3000	5000	5.0

MOA OPERATION DATA

MOA name = MOA US 01746_M2N

Mission Name	Day OPS	Night OPS	Time On Range (minutes)	Daily Day OPS	Daily Night OPS	Monthly Day OPS	Monthly Night OPS	Yearly Day OPS
A10_M2N_1	7.850	0.872	235.50	26.17	2826.	314.	4.	
A10_M2N_2	7.850	0.872	235.50	26.17	2826.	314.	14.	
A10_M2N_3	7.850	0.872	235.50	26.17	2826.	314.	2.	

	A29_M2N_1			1.850	0.097	55.50
2.92	666.	35.	16.			
	A29_M2N_2			1.850	0.097	55.50
2.92	666.	35.	52.			
	A29_M2N_3			1.850	0.097	55.50
2.92	666.	35.	18.			
	C130_M2N_1			0.378	0.356	11.33
10.67	136.	128.	3.			
	C130_M2N_2			0.378	0.356	11.33
10.67	136.	128.	24.			
	C130_M2N_3			0.378	0.356	11.33
10.67	136.	128.	3.			
	F18_M2N			1.400	0.075	42.00
2.25	504.	27.	43.			
	H60_M2N_1			1.972	0.525	59.17
15.75	710.	189.	8.			
	H60_M2N_2			1.972	0.525	59.17
15.75	710.	189.	124.			
	H60_M2N_3			1.972	0.525	59.17
15.75	710.	189.	18.			

MOA name = MOA US 01748_M2S

Monthly	Mission	Yearly		Daily		
				Day	Night	Day
Night	Day	Night	Time On Range			
	Name			OPS	OPS	OPS
OPS	OPS	OPS	(minutes)			
	A10_M2S_1			7.850	0.872	235.50
26.17	2826.	314.	4.			
	A10_M2S_2			7.850	0.872	235.50
26.17	2826.	314.	14.			
	A10_M2S_3			7.850	0.872	235.50
26.17	2826.	314.	2.			
	A29_M2S_1			1.911	0.100	57.33
3.00	688.	36.	16.			
	A29_M2S_2			1.911	0.100	57.33
3.00	688.	36.	52.			
	A29_M2S_3			1.911	0.100	57.33
3.00	688.	36.	18.			
	C130_M2S_1			0.378	0.356	11.33
10.67	136.	128.	3.			
	C130_M2S_2			0.378	0.356	11.33
10.67	136.	128.	24.			
	C130_M2S_3			0.378	0.356	11.33
10.67	136.	128.	3.			
	F18_M2S			1.369	0.072	41.08
2.17	493.	26.	43.			
	H60_M2S_1			1.972	0.525	59.17

```
15.75       710.       189.         8.
      H60_M2S_2                                    1.972      0.525      59.17
15.75       710.       189.       124.
      H60_M2S_3                                    1.972      0.525      59.17
15.75       710.       189.        18.
```

***** MOA RANGE NOISEMAP *****
RESULTS

The noise metric is Ldnmr.

MOA RESULTS

MOA Name	MOA Area (sq statute miles)	Uniform Distributed Sound Level (dB)	Number of Daily Events Above SEL of 65.0 dB
MOA US 01746_M2N	420.7	44.3	0.0
MOA US 01748_M2S	536.5	43.2	0.0

***** MOA RANGE NOISEMAP *****
RESULTS

SPECIFIC POINT RESULTS

Specific Point: 11 HLZ
Top 20 contributors to this level:

< Airspace > Aircraft	Sound Level (dB)	HA(%)	Mission
MOA US 01748_M2S			A10_M2S_2
A-10A	39.1	0.4	
MOA US 01748_M2S			H60_M2S_2

```
   UH60A        37.2        0.3
 MOA US 01748_M2S                              A10_M2S_3
   A-10A      < 35.0
 MOA US 01748_M2S                              H60_M2S_3
   UH60A      < 35.0
 MOA US 01748_M2S                              F18_M2S
   F-18A/C    < 35.0
 MOA US 01748_M2S                              A29_M2S_3
   T-6        < 35.0
 MOA US 01748_M2S                              C130_M2S_2
   C-130J     < 35.0
 MOA US 01748_M2S                              A10_M2S_1
   A-10A      < 35.0
 MOA US 01748_M2S                              A29_M2S_2
   T-6        < 35.0
 MOA US 01748_M2S                              C130_M2S_3
   C-130J     < 35.0
 MOA US 01748_M2S                              H60_M2S_1
   UH60A      < 35.0
 MOA US 01748_M2S                              C130_M2S_1
   C-130J     < 35.0
 MOA US 01748_M2S                              A29_M2S_1
   T-6        < 35.0
 MOA US 01746_M2N                              A10_M2N_2
   A-10A      < 35.0
 MOA US 01746_M2N                              H60_M2N_2
   UH60A      < 35.0
 MOA US 01746_M2N                              A10_M2N_3
   A-10A      < 35.0
 MOA US 01746_M2N                              H60_M2N_3
   UH60A      < 35.0
 MOA US 01746_M2N                              F18_M2N
   F-18A/C    < 35.0
 MOA US 01746_M2N                              A29_M2N_3
   T-6        < 35.0
 MOA US 01746_M2N                              C130_M2N_2
   C-130J     < 35.0


Total Level ........     43.2        0.6


    Specific Point:  75.8 HLZ_DZ
    Top 20 contributors to this level:


                Sound Level
    <                Airspace                 >  Mission
       Aircraft     (dB)       HA(%)
```

```
MOA US 01748_M2S                                A10_M2S_2
   A-10A        39.1        0.4
MOA US 01748_M2S                                H60_M2S_2
   UH60A        37.2        0.3
MOA US 01748_M2S                                A10_M2S_3
   A-10A      < 35.0
MOA US 01748_M2S                                H60_M2S_3
   UH60A      < 35.0
MOA US 01748_M2S                                F18_M2S
   F-18A/C    < 35.0
MOA US 01748_M2S                                A29_M2S_3
   T-6        < 35.0
MOA US 01748_M2S                                C130_M2S_2
   C-130J     < 35.0
MOA US 01748_M2S                                A10_M2S_1
   A-10A      < 35.0
MOA US 01748_M2S                                A29_M2S_2
   T-6        < 35.0
MOA US 01748_M2S                                C130_M2S_3
   C-130J     < 35.0
MOA US 01748_M2S                                H60_M2S_1
   UH60A      < 35.0
MOA US 01748_M2S                                C130_M2S_1
   C-130J     < 35.0
MOA US 01748_M2S                                A29_M2S_1
   T-6        < 35.0
MOA US 01746_M2N                                A10_M2N_2
   A-10A      < 35.0
MOA US 01746_M2N                                H60_M2N_2
   UH60A      < 35.0
MOA US 01746_M2N                                A10_M2N_3
   A-10A      < 35.0
MOA US 01746_M2N                                H60_M2N_3
   UH60A      < 35.0
MOA US 01746_M2N                                F18_M2N
   F-18A/C    < 35.0
MOA US 01746_M2N                                A29_M2N_3
   T-6        < 35.0
MOA US 01746_M2N                                C130_M2N_2
   C-130J     < 35.0


Total Level ........     43.2        0.6


   Specific Point:  L2-A HLZ
   Top 20 contributors to this level:
```

Airspace	Aircraft	Sound Level (dB)	HA(%)	Mission
MOA US 01746_M2N	A-10A	< 35.0		A10_M2N_2
MOA US 01748_M2S	A-10A	< 35.0		A10_M2S_2
MOA US 01746_M2N	UH60A	< 35.0		H60_M2N_2
MOA US 01748_M2S	UH60A	< 35.0		H60_M2S_2
MOA US 01746_M2N	A-10A	< 35.0		A10_M2N_3
MOA US 01746_M2N	UH60A	< 35.0		H60_M2N_3
MOA US 01748_M2S	A-10A	< 35.0		A10_M2S_3
MOA US 01748_M2S	UH60A	< 35.0		H60_M2S_3
MOA US 01746_M2N	F-18A/C	< 35.0		F18_M2N
MOA US 01746_M2N	T-6	< 35.0		A29_M2N_3
MOA US 01746_M2N	C-130J	< 35.0		C130_M2N_2
MOA US 01748_M2S	F-18A/C	< 35.0		F18_M2S
MOA US 01748_M2S	T-6	< 35.0		A29_M2S_3
MOA US 01748_M2S	C-130J	< 35.0		C130_M2S_2
MOA US 01746_M2N	A-10A	< 35.0		A10_M2N_1
MOA US 01748_M2S	A-10A	< 35.0		A10_M2S_1
MOA US 01746_M2N	C-130J	< 35.0		C130_M2N_3
MOA US 01746_M2N	T-6	< 35.0		A29_M2N_2
MOA US 01748_M2S	T-6	< 35.0		A29_M2S_2
MOA US 01746_M2N	UH60A	< 35.0		H60_M2N_1

Total Level ..... < 35.0

Specific Point: L3-2 DZ

Top 20 contributors to this level:

< Airspace	Aircraft	Sound Level (dB)	HA(%)	> Mission
MOA US 01748_M2S				A10_M2S_2
	A-10A	39.1	0.4	
MOA US 01748_M2S				H60_M2S_2
	UH60A	37.2	0.3	
MOA US 01748_M2S				A10_M2S_3
	A-10A	< 35.0		
MOA US 01748_M2S				H60_M2S_3
	UH60A	< 35.0		
MOA US 01748_M2S				F18_M2S
	F-18A/C	< 35.0		
MOA US 01748_M2S				A29_M2S_3
	T-6	< 35.0		
MOA US 01748_M2S				C130_M2S_2
	C-130J	< 35.0		
MOA US 01748_M2S				A10_M2S_1
	A-10A	< 35.0		
MOA US 01748_M2S				A29_M2S_2
	T-6	< 35.0		
MOA US 01748_M2S				C130_M2S_3
	C-130J	< 35.0		
MOA US 01748_M2S				H60_M2S_1
	UH60A	< 35.0		
MOA US 01748_M2S				C130_M2S_1
	C-130J	< 35.0		
MOA US 01748_M2S				A29_M2S_1
	T-6	< 35.0		
MOA US 01746_M2N				A10_M2N_2
	A-10A	< 35.0		
MOA US 01746_M2N				H60_M2N_2
	UH60A	< 35.0		
MOA US 01746_M2N				A10_M2N_3
	A-10A	< 35.0		
MOA US 01746_M2N				H60_M2N_3
	UH60A	< 35.0		
MOA US 01746_M2N				F18_M2N
	F-18A/C	< 35.0		
MOA US 01746_M2N				A29_M2N_3
	T-6	< 35.0		
MOA US 01746_M2N				C130_M2N_2
	C-130J	< 35.0		

Total Level 43.2 0.6

Specific Point: L4-3 HLZ
Top 20 contributors to this level:

Airspace	Aircraft	Sound Level (dB)	HA(%)	Mission
MOA US 01746_M2N	A-10A	40.1	0.4	A10_M2N_2
MOA US 01746_M2N	UH60A	38.2	0.3	H60_M2N_2
MOA US 01746_M2N	A-10A	< 35.0		A10_M2N_3
MOA US 01746_M2N	UH60A	< 35.0		H60_M2N_3
MOA US 01746_M2N	F-18A/C	< 35.0		F18_M2N
MOA US 01746_M2N	T-6	< 35.0		A29_M2N_3
MOA US 01746_M2N	C-130J	< 35.0		C130_M2N_2
MOA US 01746_M2N	A-10A	< 35.0		A10_M2N_1
MOA US 01746_M2N	C-130J	< 35.0		C130_M2N_3
MOA US 01746_M2N	T-6	< 35.0		A29_M2N_2
MOA US 01746_M2N	UH60A	< 35.0		H60_M2N_1
MOA US 01746_M2N	C-130J	< 35.0		C130_M2N_1
MOA US 01746_M2N	T-6	< 35.0		A29_M2N_1
MOA US 01748_M2S	A-10A	< 35.0		A10_M2S_2
MOA US 01748_M2S	UH60A	< 35.0		H60_M2S_2
MOA US 01748_M2S	A-10A	< 35.0		A10_M2S_3
MOA US 01748_M2S	UH60A	< 35.0		H60_M2S_3
MOA US 01748_M2S	F-18A/C	< 35.0		F18_M2S
MOA US 01748_M2S	T-6	< 35.0		A29_M2S_3
MOA US 01748_M2S	C-130J	< 35.0		C130_M2S_2

```
Total Level ........     44.2        0.7


     <Run Log>
     Date:                   5/ 2/2022
     Start Time:            11:48:48
     Stop Time:             12:50:45
     Total Running Time:    61 minutes and  58 seconds.
```

Appendix C: Air Quality Analysis

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Appendix C:
Air uality Analysis

Summary of Air Emissions from Proposed Action at All 5 HLZ / DZ

Proposed Action	Air Pollutant Emissions (tons per year)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
L2-A HLZ	2.01	4.19	0.73	0.65	0.40	0.01	1,197
L4-3 HLZ	1.78	3.43	0.58	0.52	0.33	0.01	990
HLZ 11	1.83	3.60	0.61	0.55	0.34	0.01	1,036
L3-2 DZ	6.11	6.45	1.17	0.98	0.70	1.49	2,127
75.8 DZ	6.20	6.76	1.23	1.03	0.73	1.49	2,212
Total	17.94	24.42	4.33	3.75	2.50	3.01	7,562
Insignificance Indicator	250	250	250	250	250	250	75,000
Exceedance?	No	No	No	No	No	No	No

Description of Proposed Action

The proposed action would lease up to five parcels for use as HLZs and DZs for Moody AFB aircraft and personnel training operations. The Air Force would notify parcel landowners of intent to lease and begin correspondence with nearby residences to communicate the intended uses. Site development would be limited to the clearing of vegetation and debris. Daily training sorties would involve HH-60 hovering and pattern work as part of personnel recovery exercises. Larger monthly LFEs involve HH-60s, C-130s, and A-10s, as well as simulated ground troops and vehicles.

Description of Air Quality Impact Analysis

Air emissions are generated from aircraft (HH-60, C-130, and A-10) operations, ground vehicle operations, and munitions use. Where possible, 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 Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989). However, of the air emission sources associated with the proposed action, ACAM only includes provisions for estimating air emissions from C-130 and A-10 aircraft. Air emissions from HH-60, ground vehicle, and munitions operations were estimated using engineering analyses as documented in this appendix.

Air Emissions from Proposed Action at L2-A HLZ

1 Day-to-Day Operations - HH-60G Aircraft

1.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

1.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per week:	2	
Number weeks LTOs conducted per year:	52	
Number of LTOs per year for all aircraft:	208	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

1.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

1.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

1.2.3 Low Flight Pattern Information

Travel Moody AFB to HLZ

Distance to HLZ (mi)	47
KIAS	110
Round trip time to/from HLZ (min)	51.3

Engine Power Setting	Time in Mode (min/sortie)	
Flight max	51.3	Travel time to/from HLZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near HLZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at HLZ
Ground Idle	12.0	Ground running time at HLZ

1.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

1.4 Air Emissions - Day to Day Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	98	26,371	0.61	0.04	0.02	0.02	0.01	0.01	42.64
Flight Idle	201	188,325	0.48	1.03	0.12	0.11	0.10	0.00	304.52
Flight max	405	507,122	0.89	3.01	0.56	0.51	0.27	0.00	820.02
Overspeed	12.7	18,371	0.03	0.10	0.02	0.02	0.01	0.00	29.71
Total			**2.01**	**4.19**	**0.73**	**0.65**	**0.40**	**0.01**	**1,196.89**

Air Emissions from Proposed Action at L4-3 HLZ

1 Day-to-Day Operations - HH-60G Aircraft

1.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

1.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per week:	2	
Number weeks LTOs conducted per year:	52	
Number of LTOs per year for all aircraft:	208	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

1.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

1.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

1.2.3 Low Flight Pattern Information

Travel Moody AFB to HLZ

Distance to HLZ (mi)	20
KIAS	110
Round trip time to/from HLZ (min)	21.8

Engine Power Setting	Time in Mode (min/sortie)	
Flight max	21.8	Travel time to/from HLZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near HLZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at HLZ
Ground Idle	12.0	Ground running time at HLZ

1.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

1.4 Air Emissions - Day to Day Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	98	26,371	0.61	0.04	0.02	0.02	0.01	0.01	42.64
Flight Idle	201	188,325	0.48	1.03	0.12	0.11	0.10	0.00	304.52
Flight max	303	379,281	0.67	2.25	0.42	0.38	0.20	0.00	613.30
Overspeed	12.7	18,371	0.03	0.10	0.02	0.02	0.01	0.00	29.71
Total			**1.78**	**3.43**	**0.58**	**0.52**	**0.33**	**0.01**	**990.17**

Air Emissions from Proposed Action at HLZ 11

1 Day-to-Day Operations - HH-60G Aircraft

1.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

1.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per week:	2	
Number weeks LTOs conducted per year:	52	
Number of LTOs per year for all aircraft:	208	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

1.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

1.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

1.2.3 Low Flight Pattern Information

Travel Moody AFB to HLZ		
Distance to HLZ (mi)	26	
KIAS	110	
Round trip time to/from HLZ (min)	28.4	
Engine Power Setting	Time in Mode (min/sortie)	
Flight max	28.4	Travel time to/from HLZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near HLZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at HLZ
Ground Idle	12.0	Ground running time at HLZ

1.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

1.4 Air Emissions - Day to Day Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	98	26,371	0.61	0.04	0.02	0.02	0.01	0.01	42.64
Flight Idle	201	188,325	0.48	1.03	0.12	0.11	0.10	0.00	304.52
Flight max	326	407,690	0.72	2.42	0.45	0.41	0.22	0.00	659.24
Overspeed	12.7	18,371	0.03	0.10	0.02	0.02	0.01	0.00	29.71
Total			**1.83**	**3.60**	**0.61**	**0.55**	**0.34**	**0.01**	**1,036.10**

Air Emissions from Proposed Action at L3-2 DZ

1 Day-to-Day Operations - HH-60G Aircraft

1.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

1.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per week:	2	
Number weeks LTOs conducted per year:	52	
Number of LTOs per year for all aircraft:	208	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

1.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

1.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

1.2.3 Low Flight Pattern Information

Travel Moody AFB to DZ

Distance to DZ (mi)	20
KIAS	110
Round trip time to/from DZ (min)	21.8

Engine Power Setting	Time in Mode (min/sortie)	
Flight max	21.8	Travel time to/from DZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near DZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at DZ
Ground Idle	12.0	Ground running time at DZ

1.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

1.4 Air Emissions - Day to Day Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	98	26,371	0.61	0.04	0.02	0.02	0.01	0.01	42.64
Flight Idle	201	188,325	0.48	1.03	0.12	0.11	0.10	0.00	304.52
Flight max	303	379,281	0.67	2.25	0.42	0.38	0.20	0.00	613.30
Overspeed	12.7	18,371	0.03	0.10	0.02	0.02	0.01	0.00	29.71
Total			**1.78**	**3.43**	**0.58**	**0.52**	**0.33**	**0.01**	**990.17**

2 Occassional Operations - HH-60G Aircraft

2.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

2.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per month:	2	
Number months LTOs conducted per year:	12	
Number of LTOs per year for all aircraft:	48	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

2.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

2.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

2.2.3 Low Flight Pattern Information

Travel Moody AFB to DZ

Distance to DZ (mi)	20
KIAS	110
Round trip time to/from DZ (min)	21.8

Engine Power Setting	Time in Mode (min/sortie)	
Flight max	21.8	Travel time to/from DZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near DZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at DZ
Ground Idle	12.0	Ground running time at DZ

2.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

2.4 Air Emissions - Occassional Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	26	7,075	0.16	0.01	0.01	0.00	0.00	0.00	11.44
Flight Idle	55	51,252	0.13	0.28	0.03	0.03	0.03	0.00	82.88
Flight max	73	90,994	0.16	0.54	0.10	0.09	0.05	0.00	147.14
Overspeed	6.6	9,593	0.01	0.05	0.01	0.01	0.01	0.00	15.51
Total			**0.47**	**0.89**	**0.15**	**0.14**	**0.09**	**0.00**	**256.96**

3 Occassional Operations - C-130 Aircraft

Analyis of air emissions from occasstional C-130 aircraft operations was completed using the USAF's Air Conformity Applicability Model (ACAM). See the detailed ACAM report for a desciption of the air emissions calculations. Results are summarized in Section 3.2.

3.1 Aircraft & Engine

Aircraft type: WC-130H
Aircraft engine: T56-A-15
Number of engines/aircraft: 4

3.2 Air Emissions - Occasional Operations of C-130 Aircraft

Operation	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Total	1.35	1.94	0.13	0.12	0.25	0.70	744.60

4 Occassional Operations - A-10 Aircraft

Analyis of air emissions from occasstional A-10 aircraft operations was completed using the USAF's Air Conformity Applicability Model (ACAM). See the detailed ACAM report for a desciption of the air emissions calculations. Results are summarized in Section 4.2.

4.1 Aircraft & Engine

Aircraft type: OA-10A
Aircraft engine: TF34-GE-100
Number of engines/aircraft: 2

4.2 Air Emissions - Occasional Operations of A-10 Aircraft

Operation	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Total	2.51	0.18	0.31	0.21	0.04	0.77	135.30

5 Occassional Operations - Ground Vehicles

5.1 Ground Vehicle Information

Vehicle type: LDDT Light duty diesel truck assumed (HMMV)

5.2 Ground Vehicle Operations

Number of vehicles: 2
Number of operations per month: 2
Number months operations conducted per year: 12
Number of operations per year for all vehicles: 48
Travel Moody AFB to DZ
Distance to DZ (mi) 20
Round trip distance (mi) 40
Miles per year (VMT): 1920

5.3 Emission Factors

Vehicle Type	Emission Factors (g/mile)						
	CO	NOx	PM10	PM2.5	Sox	VOC	CO2e
LDDT	4.43	0.37	0.01	0.01	0.00	0.23	443

Notes:
Emission factors for LDDT vehicle located in Georgia [Air Emissions Guide for Air Force Mobile Sources, Table 5-19, June 2020, USAF]

5.4 Air Emissions - Occasional Operations of Ground Vehicles

Vehicle Type	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Total	**9.38E-03**	**7.91E-04**	**1.48E-05**	**1.27E-05**	**8.47E-06**	**4.93E-04**	**0.94**

6 Occassional Operations - Ammunition Usage

6.1 Ammunition Operations

Ammunition Description	Rounds Used (#/Operation)
7.62-mm (M240)	100
5.56-mm (M4)	500
Smoke cartridge (MK-18)	4
Smoke cartridge (MK-23)	1
Ground burst simulator	2

Number of operations per month: 2
Number months operations conducted per year: 12
Number of operations per year: 24

6.2 Emission Factors

Ammunition Description	DODIC	Emission Factors (lb/item)						
		CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
7.62-mm (M240)	A143	2.30E-03	9.70E-05	5.10E-05	3.80E-05			1.20E-03
5.56-mm (M4)	A059	1.60E-03	8.50E-05	3.90E-05	2.80E-05			8.70E-04
Smoke cartridge (MK-18)	G940	1.20E-02	8.10E-05	1.30E-01	1.00E-01	1.60E-04	2.10E-03	8.40E-02
Smoke cartridge (MK-23)	G978	1.20E-02	4.40E-04	5.30E-02	2.90E-02		2.00E-03	1.50E-02
Ground burst simulator	L594	2.10E-03	5.50E-03	1.90E-01	1.90E-01	1.50E-04	1.30E-04	3.40E-03

Notes:
Emission factors for DODIC A143 from AP-42, Section 15.1.15, Table 15.1.15-1 [February 2008, USEPA].
Emission factors for DODIC A059 from AP-42, Section 15.1.4, Table 15.1.4-1 [February 2008, USEPA].
Emission factors for DODIC G940 from AP-42, Section 15.5.6, Table 15.5.6-1 [July 2009, USEPA].
Emission factors for DODIC G978 from AP-42, Section 15.5.11, Table 15.5.11-1 [July 2009, USEPA].
Emission factors for DODIC L594 from AP-42, Section 15.8.10, Table 15.8.10-1 [July 2009, USEPA].

6.3 Air Emissions - Occasional Operations - Ammunition Usage

Ammunition Description	DODIC	Emissions (tons/yr)						
		CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
7.62-mm (M240)	A143	1.15E-04	4.85E-06	2.55E-06	1.90E-06	0.00E+00	0.00E+00	6.00E-05
5.56-mm (M4)	A059	4.00E-04	2.13E-05	9.75E-06	7.00E-06	0.00E+00	0.00E+00	2.18E-04
Smoke cartridge (MK-18)	G940	2.40E-05	1.62E-07	2.60E-04	2.00E-04	3.20E-07	4.20E-06	1.68E-04
Smoke cartridge (MK-23)	G978	6.00E-06	2.20E-07	2.65E-05	1.45E-05	0.00E+00	1.00E-06	7.50E-06
Ground burst simulator	L594	2.10E-06	5.50E-06	1.90E-04	1.90E-04	1.50E-07	1.30E-07	3.40E-06
Total		**5.47E-04**	**3.20E-05**	**4.89E-04**	**4.13E-04**	**4.70E-07**	**5.33E-06**	**4.56E-04**

7 Air Emissions - Total for Proposed Action at L3-2 DZ

Operation	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Day-to-Day HH60G	1.78	3.43	0.58	0.52	0.33	0.01	990.17
Occasional HH60G	0.47	0.89	0.15	0.14	0.09	0.00	256.96
Occasional C-130	1.35	1.94	0.13	0.12	0.25	0.70	744.60
Occastional A-10	2.51	0.18	0.31	0.21	0.04	0.77	135.30
Occasional Ground Vehicles	3.96E-04	7.91E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04
Occational Ammunition Use	5.47E-04	3.20E-05	4.89E-04	4.13E-04	4.70E-07	5.33E-06	4.56E-04
Total	**6.11**	**6.45**	**1.17**	**0.98**	**0.70**	**1.49**	**2,127.03**

Air Emissions from Proposed Action at 75.8 Acre DZ

1 Day-to-Day Operations - HH-60G Aircraft

1.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

1.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per week:	2	
Number weeks LTOs conducted per year:	52	
Number of LTOs per year for all aircraft:	208	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

1.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

1.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

1.2.3 Low Flight Pattern Information

Travel Moody AFB to DZ

Distance to DZ (mi)	29
KIAS	110
Round trip time to/from DZ (min)	31.6

Engine Power Setting	Time in Mode (min/sortie)	
Flight max	31.6	Travel time to/from DZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near DZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at DZ
Ground Idle	12.0	Ground running time at DZ

1.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

1.4 Air Emissions - Day to Day Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	98	26,371	0.61	0.04	0.02	0.02	0.01	0.01	42.64
Flight Idle	201	188,325	0.48	1.03	0.12	0.11	0.10	0.00	304.52
Flight max	337	421,895	0.74	2.50	0.47	0.42	0.23	0.00	682.20
Overspeed	12.7	18,371	0.03	0.10	0.02	0.02	0.01	0.00	29.71
Total			**1.86**	**3.68**	**0.63**	**0.57**	**0.35**	**0.01**	**1,059.07**

2 Occassional Operations - HH-60G Aircraft

2.1 Aircraft & Engine

Aircraft type:	HH-60G
Aircraft engine:	T-700-GE-700
Number of engines:	2

2.2 Flight Operations

Number of aircraft:	2	
Number of LTOs per aircraft per month:	2	
Number months LTOs conducted per year:	12	
Number of LTOs per year for all aircraft:	48	
Number of trim test per aircraft per year:	12	One trim test assumed per month per aircraft based on ACAM
Number of trim tests per year total for all aircraft:	24	

2.2.1 Landing & Takeoff (LTO) Cycle Information

Engine Power Setting	Time in Mode (min/LTO)
Taxi/Idle Out [Ground Idle]	8.00
Takeoff [Overspeed]	2.27
Climb Out [Flight Max]	4.53
Approach [Flight Idle]	6.80
Taxi/Idle in [Ground Idle]	7.00

Time in mode during LTO for military helicopter [Air Emissions Guide for Air Force Mobile Sources, Table 2-4, June 2020, USAF]

2.2.2 Trim Test Information

Engine Power Setting	Time in Mode (min/trim test)
Ground Idle	12
Flight Idle	27
Flight Max	9
Overspeed	12

Time in mode during trim test from ACAM

2.2.3 Low Flight Pattern Information

Travel Moody AFB to DZ

Distance to DZ (mi)	29
KIAS	110
Round trip time to/from DZ (min)	31.6

Engine Power Setting	Time in Mode (min/sortie)	
Flight max	31.6	Travel time to/from DZ is below the mixing height (3,000 ft AGL)
Flight max	60.0	Pattern flight near DZ is below the mixing height (3,000 ft AGL)
Flight Idle	48.0	Hovering time at DZ
Ground Idle	12.0	Ground running time at DZ

2.3 Emission Factors

Power Setting	Thrust (%)	Fuel Flow Rate (lb/hr)	Emission Factors (lb/100 lb fuel)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	4%	134	46.24	3.36	1.48	1.33	1.07	0.50	3234.00
Flight Idle	56%	469	5.12	10.95	1.26	1.13	1.07	0.02	3234.00
Flight max	82%	626	3.51	11.87	2.22	2.00	1.07	0.01	3234.00
Overspeed	100%	725	2.81	11.43	2.61	2.33	1.07	0.01	3234.00

Notes:
Emission factors for T-700-GE-700 engine [Air Emissions Guide for Air Force Mobile Sources, Table 2-8, June 2020, USAF] except for CO2e.
CO2e emission factor obtained from ACAM.

2.4 Air Emissions - Occassional Operations of HH-60G Aircraft

Operation	Duration (hr/yr)	Fuel Usage (lb/yr)	Emissions (tons/yr)						
			CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Ground Idle	26	7,075	0.16	0.01	0.01	0.00	0.00	0.00	11.44
Flight Idle	55	51,252	0.13	0.28	0.03	0.03	0.03	0.00	82.88
Flight max	81	100,827	0.18	0.60	0.11	0.10	0.05	0.00	163.04
Overspeed	6.6	9,593	0.01	0.05	0.01	0.01	0.01	0.00	15.51
Total			**0.49**	**0.95**	**0.16**	**0.15**	**0.09**	**0.00**	**272.87**

3 Occassional Operations - C-130 Aircraft

Analyis of air emissions from occasstional C-130 aircraft operations was completed using the USAF's Air Conformity Applicability Model (ACAM). See the detailed ACAM report for a desciption of the air emissions calculations. Results are summarized in Section 3.2.

3.1 Aircraft & Engine

Aircraft type: WC-130H
Aircraft engine: T56-A-15
Number of engines/aircraft: 4

3.2 Air Emissions - Occasional Operations of C-130 Aircraft

Operation	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Total	1.35	1.94	0.13	0.12	0.25	0.70	744.60

4 Occassional Operations - A-10 Aircraft

Analyis of air emissions from occasstional A-10 aircraft operations was completed using the USAF's Air Conformity Applicability Model (ACAM). See the detailed ACAM report for a desciption of the air emissions calculations. Results are summarized in Section 4.2.

4.1 Aircraft & Engine

Aircraft type: OA-10A
Aircraft engine: TF34-GE-100
Number of engines/aircraft: 2

4.2 Air Emissions - Occasional Operations of A-10 Aircraft

Operation	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Total	2.51	0.18	0.31	0.21	0.04	0.77	135.30

5 Occassional Operations - Ground Vehicles

5.1 Ground Vehicle Information

Vehicle type: LDDT Light duty diesel truck assumed (HMMV)

5.2 Ground Vehicle Operations

Number of vehicles: 2
Number of operations per month: 2
Number months operations conducted per year: 12
Number of operations per year for all vehicles: 48
Travel Moody AFB to DZ
Distance to DZ (mi) 29
Round trip distance (mi) 58
Miles per year (VMT): 2784

5.3 Emission Factors

Vehicle Type	Emission Factors (g/mile)						
	CO	NOx	PM10	PM2.5	Sox	VOC	CO2e
LDDT	4.43	0.37	0.01	0.01	0.00	0.23	443

Notes:
Emission factors for LDDT vehicle located in Georgia [Air Emissions Guide for Air Force Mobile Sources, Table 5-19, June 2020, USAF]

5.4 Air Emissions - Occasional Operations of Ground Vehicles

Vehicle Type	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Total	**1.36E-02**	**1.15E-03**	**2.15E-05**	**1.84E-05**	**1.23E-05**	**7.15E-04**	**1.36**

6 Occassional Operations - Ammunition Usage

6.1 Ammunition Operations

Ammunition Description	Rounds Used (#/Operation)
7.62-mm (M240)	100
5.56-mm (M4)	500
Smoke cartridge (MK-18)	4
Smoke cartridge (MK-23)	1
Ground burst simulator	2

Number of operations per month:	2
Number months operations conducted per year:	12
Number of operations per year:	24

6.2 Emission Factors

Ammunition Description	DODIC	Emission Factors (lb/item)						
		CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
7.62-mm (M240)	A143	2.30E-03	9.70E-05	5.10E-05	3.80E-05			1.20E-03
5.56-mm (M4)	A059	1.60E-03	8.50E-05	3.90E-05	2.80E-05			8.70E-04
Smoke cartridge (MK-18)	G940	1.20E-02	8.10E-05	1.30E-01	1.00E-01	1.60E-04	2.10E-03	8.40E-02
Smoke cartridge (MK-23)	G978	1.20E-02	4.40E-04	5.30E-02	2.90E-02		2.00E-03	1.50E-02
Ground burst simulator	L594	2.10E-03	5.50E-03	1.90E-01	1.90E-01	1.50E-04	1.30E-04	3.40E-03

Notes:
Emission factors for DODIC A143 from AP-42, Section 15.1.15, Table 15.1.15-1 [February 2008, USEPA].
Emission factors for DODIC A059 from AP-42, Section 15.1.4, Table 15.1.4-1 [February 2008, USEPA].
Emission factors for DODIC G940 from AP-42, Section 15.5.6, Table 15.5.6-1 [July 2009, USEPA].
Emission factors for DODIC G978 from AP-42, Section 15.5.11, Table 15.5.11-1 [July 2009, USEPA].
Emission factors for DODIC L594 from AP-42, Section 15.8.10, Table 15.8.10-1 [July 2009, USEPA].

6.3 Air Emissions - Occasional Operations - Ammunition Usage

Ammunition Description	DODIC	Emissions (tons/yr)						
		CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
7.62-mm (M240)	A143	1.15E-04	4.85E-06	2.55E-06	1.90E-06	0.00E+00	0.00E+00	6.00E-05
5.56-mm (M4)	A059	4.00E-04	2.13E-05	9.75E-06	7.00E-06	0.00E+00	0.00E+00	2.18E-04
Smoke cartridge (MK-18)	G940	2.40E-05	1.62E-07	2.60E-04	2.00E-04	3.20E-07	4.20E-06	1.68E-04
Smoke cartridge (MK-23)	G978	6.00E-06	2.20E-07	2.65E-05	1.45E-05	0.00E+00	1.00E-06	7.50E-06
Ground burst simulator	L594	2.10E-06	5.50E-06	1.90E-04	1.90E-04	1.50E-07	1.30E-07	3.40E-06
Total		**5.47E-04**	**3.20E-05**	**4.89E-04**	**4.13E-04**	**4.70E-07**	**5.33E-06**	**4.56E-04**

7 Air Emissions - Total for Proposed Action at 75.8 Acre DZ

Operation	Emissions (tons/yr)						
	CO	NOx	PM10	PM2.5	SOx	VOC	CO2e
Day-to-Day HH60G	1.86	3.68	0.63	0.57	0.35	0.01	1,059.07
Occasional HH60G	0.49	0.95	0.16	0.15	0.09	0.00	272.87
Occasional C-130	1.35	1.94	0.13	0.12	0.25	0.70	744.60
Occastional A-10	2.51	0.18	0.31	0.21	0.04	0.77	135.30
Occasional Ground Vehicles	3.96E-04	1.15E-03	3.96E-04	3.96E-04	3.96E-04	3.96E-04	3.96E-04
Occational Ammunition Use	5.47E-04	3.20E-05	4.89E-04	4.13E-04	4.70E-07	5.33E-06	4.56E-04
Total	**6.20**	**6.76**	**1.23**	**1.03**	**0.73**	**1.49**	**2,211.84**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: MOODY AFB
State: Georgia
County(s): Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Development of Additional HLZS and DZS at Moody Air Force Base, Georgia

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2023

- Action Purpose and Need:

The purpose of the proposed action is to address scheduling conflicts and increase range space by leasing land for the development of three HLZs and two DZs within Moody AFB airspace. This will increase the ability of Attack and Rescue forces to prepare for major combat operations given extremely limited training and mission rehearsal areas and increased costs incurred by off-station/Temporary Duty Travel requirements to adequately prepare for real world missions.

The proposed action is needed to alleviate recurring scheduling conflicts and provide more realistic and varied training areas for 347 RQG and 23 WG aircraft. The lack of space in current HLZ/DZ training areas lends itself to lost training proficiency and currency, which in turn drives up the man hour costs when use of alternate training areas distant to Moody AFB and its airspace is required. New HLZs and DZs within Moody AFB airspace are required to properly simulate current mission realities and ensure comprehensive training.

- Action Description:

The proposed action would lease up to five parcels for use as HLZs and DZs for Moody AFB aircraft and personnel training operations. The Air Force would notify parcel landowners of intent to lease and begin correspondence with nearby residences to communicate the intended uses. Site development would be limited to the clearing of vegetation and debris. Daily training sorties would involve HH-60 hovering and pattern work as part of personnel recovery exercises. Larger monthly LFEs would begin involving HH-60s, C-130s, and A-10s, as well as simulated ground troops and vehicles.

- Point of Contact

Name: Sydnie Margallo
Title: Air Quality Specialist and Environmental Analyst
Organization: Wood, Environment & Infrastructure Solutions, Inc.
Email: sydnie.margallo@woodplc.com
Phone Number:

- Activity List:

Activity Type		Activity Title
2.	Aircraft	L3-2DZ: Occassional Operations - C-130 Aircraft
3.	Aircraft	L3-2DZ: Occassional Operations - A-10 Aircraft
4.	Aircraft	75.8 DZ: Occassional Operations - C-130 Aircraft
5.	Aircraft	75.8 DZ: Occassional Operations - A-10 Aircraft

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: L3-2DZ: Occassional Operations - C-130 Aircraft

- Activity Description:
L3-2DZ

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.704253
SO_x	0.246199
NO_x	1.944441
CO	1.346910
PM 10	0.129706

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.115770
Pb	0.000000
NH_3	0.000000
CO_2e	744.6

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.704253
SO_x	0.246199
NO_x	1.944441
CO	1.346910
PM 10	0.129706

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.115770
Pb	0.000000
NH_3	0.000000
CO_2e	744.6

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: WC-130H
Engine Model: T56-A-15
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	794.00	24.15	1.07	3.90	32.00	0.83	0.75	3234
Approach	1185.00	14.26	1.07	4.40	22.20	0.97	0.87	3234
Intermediate	1825.00	0.58	1.07	9.20	2.40	0.51	0.46	3234
Military	2302.00	0.46	1.07	9.30	2.10	0.50	0.45	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 24
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 9.2
Takeoff [Military] (mins): 0.4
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 121.2 [Note: Includes 120 min low altitude flight time near DZ]
Approach [Approach] (mins): 5.1
Taxi/Idle In [Idle] (mins): 6.7

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): 12
AfterBurn (mins): 0

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$AEPS_{AFTERBURN}$: 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
1	1	No	GTCP 85-180L	

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
GTCP 85-180L	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

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

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: L3-2DZ: Occassional Operations - A-10 Aircraft

- Activity Description:
L3-2 DZ

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A

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End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.772983
SO_x	0.044762
NO_x	0.181563
CO	2.511439
PM 10	0.308591

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.205257
Pb	0.000000
NH_3	0.000000
CO_2e	135.3

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.772983
SO_x	0.044762
NO_x	0.181563
CO	2.511439
PM 10	0.308591

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.205257
Pb	0.000000
NH_3	0.000000
CO_2e	135.3

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OA-10A
Engine Model: TF34-GE-100
Primary Function: Combat
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 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	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 24
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 12

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	18.5
Takeoff [Military] (mins):	0.4
Takeoff [After Burn] (mins):	0
Climb Out [Intermediate] (mins):	120.8 [Note: Includes 120 min low altitude flight time near DZ]
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):	12
AfterBurn (mins):	0

3.3.2 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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)

3.4 Auxiliary Power Unit (APU)

3.4.1 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

3.4.2 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

3.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 75.8 DZ: Occassional Operations - C-130 Aircraft

- Activity Description:
75.8 DZ

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.704253
SO_x	0.246199
NO_x	1.944441
CO	1.346910
PM 10	0.129706

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.115770
Pb	0.000000
NH_3	0.000000
CO_2e	744.6

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.704253
SO_x	0.246199
NO_x	1.944441
CO	1.346910
PM 10	0.129706

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.115770
Pb	0.000000
NH_3	0.000000
CO_2e	744.6

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Aircraft & Engine

Aircraft Designation: WC-130H
Engine Model: T56-A-15
Primary Function: Transport - Bomber
Aircraft has After burn: No
Number of Engines: 4

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

4.2.2 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	794.00	24.15	1.07	3.90	32.00	0.83	0.75	3234
Approach	1185.00	14.26	1.07	4.40	22.20	0.97	0.87	3234
Intermediate	1825.00	0.58	1.07	9.20	2.40	0.51	0.46	3234
Military	2302.00	0.46	1.07	9.30	2.10	0.50	0.45	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 24
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 9.2
Takeoff [Military] (mins): 0.4
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 121.2 [Note: Includes 120 min low altitude flight time near DZ]
Approach [Approach] (mins): 5.1
Taxi/Idle In [Idle] (mins): 6.7

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): 12
AfterBurn (mins): 0

4.3.2 Flight Operations Formula(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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)

4.4 Auxiliary Power Unit (APU)

4.4.1 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
1	1	No	GTCP 85-180L	

4.4.2 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
GTCP 85-180L	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

4.4.3 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

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Lowndes
Regulatory Area(s): NOT IN A REGULATORY AREA

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: 75.8 DZ: Occassional Operations - A-10 Aircraft

- Activity Description:
75.8 DZ

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.772983
SO_x	0.044762
NO_x	0.181563
CO	2.511439
PM 10	0.308591

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.205257
Pb	0.000000
NH_3	0.000000
CO_2e	135.3

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.772983
SO_x	0.044762
NO_x	0.181563
CO	2.511439
PM 10	0.308591

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.205257
Pb	0.000000
NH_3	0.000000
CO_2e	135.3

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OA-10A
Engine Model: TF34-GE-100
Primary Function: Combat
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

5.2.2 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	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 24
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 18.5
Takeoff [Military] (mins): 0.4
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 120.8 [Note: Includes 120 min low altitude flight time near DZ]
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): 12
AfterBurn (mins): 0

5.3.2 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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$AEM_{APPROACH}$: 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)

5.4 Auxiliary Power Unit (APU)

5.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

5.4.2 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

5.4.3 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