125 FW - JACKSONVILLE, FL

FLORIDA AIR NATIONAL GUARD 125th FIGHTER WING (ACC) Jacksonville IAP, Floride

FL1.0 **125TH FIGHTER WING INSTALLATION OVERVIEW**

This section presents an overview of the 125th Fighter Wing (125 FW), Jacksonville, Florida; the specifics of the Proposed Action as it relates to both the airfield and the associated airspace; construction and facility modifications required at the installation; and changes to personnel that would result if the F-35A was beddown at the 125 FW installation.

The 125 FW of the Florida Air National Guard (FLANG) is located on property owned by the Jacksonville International Airport (IAP) that is leased by the federal government and then licensed back to the State of Florida for use by the FLANG. The airport is located 10 miles north of downtown Jacksonville in Duval County in northeastern Florida (Figure FL1.0-1). Facilities and land area associated with the 125 FW currently comprise 342 acres.

The federal mission of the 125 FW is to provide fully trained and qualified personnel for air defense for the southeastern United States (U.S.), from Charleston, South Carolina to the southern tip of Florida and across the Florida panhandle, as directed by the North American Aerospace Defense Command and United States Northern Command. The 125 FW also maintains a state mission of protecting life and property and preserving peace, order, and public safety. These missions are accomplished through emergency relief support during natural disasters such as floods, earthquakes and forest fires; search and rescue operations; support to civil defense authorities; maintenance of vital public services and counterdrug operations (FLANG 2017a). The 125 FW currently operates 18 F-15C aircraft.

In the sections that follow, FL2.0 presents the installation-specific description of the Proposed Action at the 125 FW installation. Section FL3.0 addresses the affected environment and environmental consequences that could result if the 125 FW installation was selected as one of the F-35A beddown locations. Refer to Chapter 3 for a complete and detailed definition of resources and the methodology applied to identify potential impacts. Section FL4.0 identifies other, unrelated past, present, and reasonably foreseeable future actions in the affected environment and evaluates whether these actions would cause cumulatively significant effects when considered along with the F-35A beddown actions. This section also represents the irreversible and irretrievable resources that would be committed if the beddown were implemented at the 125 FW installation.



FL2.0 125TH FIGHTER WING ALTERNATIVE

FL2.1 125TH FIGHTER WING INSTALLATION

Four elements of this alternative have the potential to affect the 125 FW installation: 1) conversion from F-15s to F-35As, 2) operations conducted by F-35As, 3) construction and modification projects to support beddown of the F-35A, and 4) personnel changes to meet F-35A requirements. Each is explained in more detail below.

FL2.1.1 Aircraft Conversion

Under this alternative, 18 F-35A aircraft would be based at the 125 FW installation. The beddown is anticipated to begin in 2023 with delivery of the first F-35A aircraft and would be complete by 2024 when the full complement of 18 F-35A aircraft would be at the installation. Drawdown of the 125 FW's F-15Cs would be complete approximately 6 months before the arrival of the F-35A.

FL2.1.2 Airfield Operations

The 125 FW is an integral component of the Combat Air Forces (CAF). The CAF defends the homeland of the U.S. as well as deploys forces worldwide to meet threats to ensure the security of the U.S. To fulfill this role, the 125 FW must train as it would fight.

Under this alternative, the National Guard Bureau (NGB) anticipates that by 2024, the 18 F-35A aircraft would be flying up to 6,222 operations per year at the airfield, compared to 4,850 annual operations currently with the F-15C (Table FL2.1-1). In total, Jacksonville IAP supports about 101,653 operations annually, with over 90 percent consisting of commercial and civilian flights occurring 365 days per year. Based on proposed requirements and deployment patterns under CAF, the F-35A operational aircraft would fly some operations during deployments at other locations for exercises, or in preparation for deployments. During such periods, home station flying operations would be reduced accordingly. Some of the home station missions could involve inert ordnance delivery training (within the scope of existing National Environmental Policy Act [NEPA] documentation) at approved ranges.

	Total Current Operations	Proposed F-35A Operations
Based F-15	4,850	-
Proposed F-35A	-	6,222
Other Aircraft	96,803	96,807
Total Airfield Operations	101,653	103,025
Percent Change at Airfield	N/A	1.4%

 Table FL2.1-1. Current and Proposed Annual Airfield Operations at Jacksonville IAP

Under this alternative, total 125 FW annual airfield operations would increase by 28 percent from 4,850 to 6,222. This change would represent only an approximate 1 percent increase in terms of total airfield operations, which undergoes variations greater than these on year to year annual basis.

The F-35As would employ the same departure and landing flight tracks as currently used by the F-15Cs. The 125 FW currently uses afterburner on approximately 70 percent of F-15C take-offs at the airfield due to aircraft weight and configuration. The F-35A configuration and typical take-off weights would result in a more limited use of afterburner. NGB anticipates that the F-35A may use afterburner for take-offs no more than 5 percent of the time. F-35A operations would adhere to existing restrictions, avoidance procedures, and the quiet-hours program at Jacksonville IAP, known as course rules. The F-15Cs currently fly 3 percent of the time between the hours of 10 p.m. and 7 a.m. (environmental night) primarily as a result of late arrivals. There are no scheduled departures or closed patterns after 10 p.m. or before 7 a.m. However, occasional early morning departures do occur, and overseas deployment departures may occur during environmental night, but would be infrequent. At this percentage, the F-15Cs fly about 146 total operations annually during environmental night. In contrast, the civilian and commercial aircraft perform 12 percent of their operations between the hours of 10 p.m. and 7 a.m., or about 11,000 operations per year. The F-35A would be expected to fly the same amount of operations between these hours with no environmental night (10 p.m. to 7 a.m.) departures or closed pattern operations planned. Typically, all required "after dark" operations could be achieved prior to 10 p.m.

FL2.1.3 Construction

To support the proposed F-35A operations, additional infrastructure and facilities would be required at the 125 FW installation to support the F-35A beddown. Some of these construction projects also have several options that could be implemented. Table FL2.1-2 describes these projects, the total affected area in square feet (SF), and new impervious surfaces introduced. Figures FL2.1-1a and FL2.1-1b identify the construction locations for each project within the installation. It is anticipated that construction would occur between 2020 and 2023.

Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Project #1– Flight Simulator	<u>-</u>	
Construct a new 19,000 SF Flight Simulator building northwest of B1044. This project may also include the demolition of B1044 and B1045 depending on the final configuration of the new simulator building.	19,000	19,000
Project #2 – Corrosion Control	1	
Conduct interior renovation of the existing paint booth area in B1049 for administration offices and additional power upgrades for the F-35A.	0	0
Project #3 – Engine Shop	T	
Undertake interior renovation of B1023, to include the replacement of the crane system for a 6-ton bridge crane, upgrade ventilation, and installation of fire suppression system. In addition, this project would include the replacement of the concrete roadway to meet Department of Transportation standards for a tractor-trailer turn radius, and the installation of a new culvert and fence realignment.	19,040	0
Project #4 (Option 1) – Aircraft Shelters	1 _	
Certification of the existing LPS for the current aircraft shelters.	0	0
Project #4 (Option 2) – Aircraft Shelters	T	T
Upgrading the LPS for the current aircraft shelters in the event that they are not able to be certified as is.	0	0
Project #5 –Hangar		
Conduct interior renovations of B1001 for new power requirements, new cooling system, installation of an ALIS server room, and installation of a 3-ton bridge crane	0	0
Project #6 – Squadron Operations		
Conduct interior renovations of B1005 to upgrade HVAC; install an ALIS server room; construct administration offices; and install a heat detection system and dedicated electrical panel for ALIS.	0	0
Project #7 – (Option 1) AGE		
Conduct interior renovations of B1009 (the existing AGE building), to include installing a fire suppression system, 2-ton bridge crane, ventilation, and drive-through bays, and upgrading life and safety requirements.	0	0
Project #7 – (Option 2) AGE	T	T
Option 2 would construct a new AGE facility by demolishing B1009.	9,000	9,000
Project #8 – Fuel Cell		
Undertake interior renovation of B1029 for power upgrades.	0	0
Project #9 – MSA Administration	l	
Construct a new 4,800 SF administration building located north of the current MSA facility to support the F-35A.	4,800	4,800
Project #10 – MSA Inert Storage		
Construct a new 4,500 SF inert storage facility within the existing MSA boundaries.	4,500	4,500
Project #11 – MSA MAC Pad		
Construct a 100-foot by 100-foot covered MAC Pad shelter within the MSA boundaries	10,000	10,000
Project #12 – MSA Utilities (Not shown on man)		
Upgrade all utilities within the existing MSA buildings. This includes adding underground branch lines to the new facilities.	80,000	0

Table FL2.1-2. Proposed Construction and Modifications for the 125 FW Installation(Page 1 of 2)

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Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)			
Project #13 – M&I Facility					
Construct a new 3,800 SF M&I Facility. In addition, B1035 would be demolished.	3,800	3,800			
Project #14 – (Option 1) EOD Range					
Relocate the existing EOD range to an area south of its current location. The new EOD range would only need to be constructed if the safety quantity-distance arcs for the New M&I facility extend to the current EOD range. This will be dependent on the NEW of the munitions to be stored, which is currently undetermined. The new EOD range would require the clearing of approximately 6.7 acres of forest and the installation of 5,000 SF of concrete pads.	291,852	10,000			
Project #14 – (Option 2) EOD Range					
Under this option, the EOD Range would remain in its current location and would not be moved.	0	0			
Project #15 – (Option 1) Weapons Loading Training and Washrack					
Demolish B1022 and construct a Weapons Loading Training facility in its place. In addition, add a 9,000 SF washrack adjacent to the building.	20,500	20,500			
Project #15 – (Option 2) Weapons Loading Training					
Construction of a new Weapons Loading Training facility.	11,500	11,500			
Project #16 – (Option 1) Deployable Spare Parts					
Construct a 6,000 SF addition to B1006.	6,000	0			
Project #16 – (Option 2) Deployable Spare Parts					
Construction of a new 6,000 SF facility.	6,000	0			

Table FL2.1-2. Proposed Construction and Modifications for the 125 FW Installation(Page 2 of 2)

Legend: AGE = Aerospace Ground Equipment; ALIS = Autonomic Logistics Information System; EOD = Explosive Ordnance Disposal; HVAC = heating, ventilation, and air conditioning; LPS = Lightning Protection System; M&I = Maintenance and Inspection; MAC = Munitions Assembly Conveyor; MSA = Munitions Storage Area; NEW = Net Explosive Weight; SF = square foot/feet



Figure FL2.1-1a. 125 FW Installation Construction and Modifications



FL2.1.4 Personnel

The 125 FW supports 250 federal technician civilian employees, 487 Active Guard Reserve (AGR), and 1,255 traditional guardsmen (FLANG 2017a). It is expected that the overall number of Air National Guard (ANG) personnel at the 125 FW installation would remain effectively static following conversion to the F-35A. There may be some retraining that occurs, but overall, the number of ANG personnel is expected to remain approximately the same as it currently is at the 125 FW installation. However, as a component of this proposal, a U.S. Air Force (USAF) Active Duty Associate Unit would be installed at the two selected alternatives, which would comprise up to 5 pilots, 40 maintenance staff, and approximately 5 other support staff. For more information on the USAF Active Duty Associate Unit, see Section 2.2.1.4. In addition, up to approximately 35 new personnel would be added at each installation to provide security and contract oversight for Full Mission Simulator (FMS) and the Autonomic Logistics Information System (ALIS) (broken down approximately by 7 field service, 15 ALIS support, 10 training, and 3 security personnel).

FL2.2 125th Fighter Wing: Training Airspace and Ranges

The 125 FW uses several airspace units (Table FL2.2-1 and Figure FL2.2-1), including over land Military Operations Areas (MOAs), overlying Air Traffic Control Assigned Airspace (ATCAA), Restricted Areas, and over water Warning Areas (W-); 90 percent of their training occurs in Warning Areas over the Atlantic Ocean. Over land operations in MOAs and Restricted Areas are distributed throughout several other Special Use Airspace (SUA) where operations are dominated by other users. Section 2.2.2.1 provides definitions of these airspace units. The beddown action would not require changes in SUA attributes, volume, or proximity and the type of ordnance employed at the ranges is expected to remain the same or decrease.

FL2.2.1 Airspace Use

As the replacement for fighter aircraft, the F-35As would conduct missions and training programs necessary to fulfill its multi-role responsibilities (refer to Chapter 2). All F-35A flight activities would take place in existing airspace, so no airspace modifications would be required. The NGB expects that the F-35A would operate in the airspace currently used by the 125 FW, but may operate somewhat differently than the F-15Cs now using that airspace. These differences would derive from different operating requirements for the F-35A. Currently, F-15C conduct the majority of their training in the Warning Areas offshore. The only typical uses of over land ranges are for things such as test firing of the gun system, or occasional other flights in over land MOAs.

Complex	Airspace	Floor (feet MSL) ¹	Ceiling (feet MSL) ¹
Coastal Townsend	Coastal 1/2 MOA	3,000 AGL	To BNI 18,000
Coastal Townsend	Coastal 4 MOA	14,000	To BNI 18,000
Coastal Townsend	Coastal 5 MOA	300 AGL	To BNI 18,000
Coastal Townsend	Coastal 6/7 MOA	10,000	To BNI 18,000
Coastal Townsend	Coastal 8 MOA	11,000	To BNI 18,000
Coastal Townsend	R-3007 A ²	Surface	To BNI 13,000
Coastal Townsend	R-3007 B	1,200 AGL	To BNI 13,000
Coastal Townsend	R-3007 C	100 AGL	To BNI 13,000
Coastal Townsend	R-3007 D	13,000	25,000
Palatka / Pinecastle	Palatka 1 MOA	3000 AGL	To BNI 18,000
Palatka / Pinecastle	Palatka 2 MOA	3000 AGL	To BNI 18,000
Palatka / Pinecastle	R-2910A	Surface	FL 230
Palatka / Pinecastle	R-2910B	Surface	6000 MSL
Palatka / Pinecastle	R-2910C	Surface	6000 MSL
Palatka / Pinecastle	R-2910D	2000 MSL	FL 230
Palatka / Pinecastle	R-2910E	500 AGL	2000 MSL
Over Water			
Warning Areas	W-136 B/C/E/F	Surface	Unlimited
Overwater Warning Areas			
Over Water			
Warning Areas	W-137 A/B/C/D/E/F/L	Surface	Unlimited
Overwater Warning Areas			
Over Water			
Warning Areas	W-137 G	Surface	13,000
Overwater Warning Areas			
Over Water			
Warning Areas	W-138 A/B/C/D/E/L	Surface	Unlimited
Overwater Warning Areas			
Over Water			
Warning Areas	W-139 C/D/E	Surface	Unlimited
Overwater Warning Areas			
Over Water			
Warning Areas	W-139 F	Surface	Unlimited
Overwater Warning Areas			
Over Water		~ ^	• / • • •
Warning Areas	W-140 C/D/E	Surface	24,000
Overwater Warning Areas			
Over Water	W 140 F		12 000
Warning Areas	W-140 F	Surface	13,000
Overwater Warning Areas			
Over Water	XX7 1.41		5 000
Warning Areas	W-141	Surface	5,000
Overwater Warning Areas			
Over Water	N. 470 D/D/D		TT 11 1. 1
Warning Areas	W-47/0 D/E/F	Surface	Unlimited
Overwater Warning Areas			

Table FL2.2-1. 125 FW Military Training Airspace

Notes: ¹MSL is the elevation (on the ground) or altitude (in the air) of an object, relative to the average sea level. The elevation of a mountain, for example, is marked by its highest point and is typically illustrated as a small circle on a topographic map with the MSL height shown in either feet or meters or both. Because aircraft fly across vast landscapes, where points above the ground can and do vary, MSL is used to denote the "plane" on which the floors and ceilings of SUA are established and the altitude at which aircraft must operate within that SUA. ²R-3007 supports Townsend Bombing Range.

Legend: AGL = above ground level; BNI = but not including; MOA = Military Operations Area; MSL = mean sea level; R- = Restricted area; W- = Warning Area

Source: FAA 2017.



Although the F-35As would perform some of the F-15 missions, they represent a different aircraft with different capabilities and would fly somewhat differently. Pilots would adapt training activities, where necessary, to ensure their accomplishment within available airspace. No changes to airspace structure are anticipated. The differences in utilization of the existing airspace include greater use of over land airspace by the F-35A and use of higher altitudes overall when over land. F-35A use of Warning Areas would be similar to the F-15C use of the Warning Areas, although slightly less frequently due to increased use of the over land airspace and ranges by the F-35A. F-35A would also use the over land MOA airspace for a different variety of activities related to the air-to-ground mission requirements.

The most common over land training task for the F-15C is test firing the gun system (which is typically done from lower altitudes); whereas the F-35A, when training in over land MOAs, would be expected to fly more of the time at higher altitudes than the F-15 (Table FL2.2-2), operating more than 90 percent of the time above 10,000 feet MSL, conducting its various air-to-ground mission with stand-off weapons. This would result in the F-35A aircraft conducting a greater percentage of their overall training over land, but with most of their operations in the higher altitude regimes of this airspace when they use it. Regardless of the altitude structure and percent use indicated in Table FL2.2-2, F-35A aircraft (as do existing military aircraft) would adhere to all established floors and ceilings of airspace units.

All airspace associated with the 125 FW lies within the typical flight distance available during a standard daily training flight for both the F-15C and the F-35A. For example, the floor of Coastal MOA 4 lies at 14,000 feet mean sea level (MSL), so the F-35A would not fly below that altitude in that airspace nor above the 17,999 feet MSL ceiling. Rather, pilots would adapt training to this and other airspace units like the Coastal 1/2 MOAs with lower floors.

Overtanu MOA Use					
Altitude (feet)	Percentage Use F-15C Over land	Percentage Use F-35A Multi-role			
500-2,000 AGL	1%	1%			
2,000-5,000 AGL	4%	1%			
5,000-10,000 MSL	10%	5%			
10,000-18,000 MSL	35%	24%			
18,000 MSL-30,000 MSL	35%	58%			
>30,000 MSL	15%	11%			

Table FL2.2-2. Approximate 125 FW Current and Proposed Altitude Distribution forOverland MOA Use

Legend: AGL = above ground level; MSL = mean sea level.

Table FL2.2-3 shows current use of the airspace utilized by the 125 FW and reflects the total number of aircraft (125 FW aircraft as well as other USAF, Navy, and transient aircraft); fighter aircraft (F-15C from 125 FW) that would be replaced by the F-35A are also indicated.

Airspace Unit	Total All Aircraft Current Airspace Operations	F-15C Current Airspace Operations	Proposed Total All Aircraft Airspace Operations	Proposed F-35A Airspace Operations
Warning Areas	3,393	1,821	3,639	2,067
Coastal Townsend MOA	1,126	176	1,197	247
Palatka MOA	272	226	540	494

Table FL2.2-3. Approximate 125 FW Current and Proposed Airspace Operations

Legend: MOA = Military Operations Area.

Like F-15C aircraft, the F-35A would fly approximately 90-minute long missions, including take-off, transit to and from the training airspace, training activities, and landing. The 125 FW F-15 aircraft currently conduct up to 2,400 annual sorties (or 200 monthly sorties) lasting between 30-60 minutes in the airspace. Under the Proposed Action, the F-35A aircraft would conduct up to 3,061 annual sorties (approximately 250 monthly sorties) lasting 30-60 minutes. On occasion during an exercise, the F-35A may spend up to 90 minutes in one or more airspace units. Based on this, there would be an increase of approximately 28 percent in the amount of time spent in the airspace under the Proposed Action.

To train with the full capabilities of the aircraft, the F-35A would employ supersonic flight at altitudes and within airspace already authorized for such activities. Due to the F-35As mission and the aircraft's capabilities, NGB anticipates that approximately 10 percent of the time spent in air combat training would involve supersonic flight. This would represent a substantial decrease from the F-15Cs, which have only an air-to-air mission. Supersonic flight during air combat training would be performed only in the over water Warning Areas, at least 15 nautical miles (NM) offshore. All supersonic flight would be conducted above 15,000 feet MSL, with 90 percent occurring above 30,000 feet MSL.

FL2.2.2 Ordnance Use and Defensive Countermeasures

Most air-to-ground training would be simulated, where nothing is released from the aircraft, and target scoring is done electronically. As was discussed in Chapter 2, Section 2.2.2.7, however, the F-35A (like the F-15) is capable of carrying and employing several types of air-to-air and air-to-ground ordnance (including strafing) and pilots would need training in their use. As the NGB currently envisions, the type and the number of ordnance employed is expected to remain the same or decrease. F-35A pilots would only use ranges and airspace authorized for the type of ordnance being employed and within the number already approved at a range and/or target. If in the future the NGB identifies weapons systems that are either new or could exceed currently approved levels, appropriate NEPA documentation would need to occur prior to their employment.

Townsend Range contains varied target sets for supporting laser and practice/inert air-toground weapons training. No live-weapons training is permitted at Townsend Range. It is expected that any live-fire training would be conducted during formal training exercises conducted remotely from the 125 FW installation.

Like the F-15C, the F-35A would employ chaff and flares as defensive countermeasures in training. Chaff and flares are the principal defensive mechanisms dispensed by military aircraft to avoid attack by enemy air defense systems. For the purposes of this analysis, it is estimated that F-35A chaff and flare expenditure would not exceed use by the legacy F-15Cs on a per operation basis.

Chaff and flares would be used in the Coastal MOAs/ATCAAs and in over water Warning Areas identified in Table 2.2-3 and approved for use of chaff and flares. Flares are not permitted to be released below 2,000 feet above ground level (AGL) over non-government-owned or -controlled property. The amount of chaff and flares used in each authorized airspace unit would be proportional to the number of operations conducted by the F-35As. Based on the emphasis on flight at higher altitudes for the F-35A, roughly 90 percent of F-35A flare releases would occur above 15,000 feet MSL. At this altitude, most flares would be released more than seven times higher than the minimum release altitude permitted (2,000 feet AGL) over non-government-owned or -controlled property and ensure complete burnout before reaching the ground.

FL2.3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES AT THE 125 FW INSTALLATION

Analysis of affected environment provides a benchmark that enables decision-makers to evaluate the environmental consequences of the proposed beddown alternatives at each installation. For each resource, this installation-specific section uses description of the affected environment and the evaluation of the No Action Alternative. Changes to the affected environment that are attributable to the Proposed Action are then examined for each resource. Thus, the change (increase or decrease) in the resource at each installation can be compared for all alternative locations.

FL2.4 PERMITS, AGENCY CONSULTATIONS, AND GOVERNMENT-TO-GOVERNMENT CONSULTATIONS

The 125 FW operates under agreements with a series of environmental permitting agencies for such resources as air, water, and cultural resources.

Permitting. The following section describes the permits that would be required to implement at this alternative location.

• Facilities that discharge stormwater from certain activities (including industrial activities, construction activities, and municipal stormwater collection systems) require Clean Water

Act (CWA) Section 402 National Pollutant Discharge Elimination System (NPDES) permits.

- The Florida Department of Environmental Protection (DEP) requires owners or operators of construction sites that disturb 1 acre or greater and sites less than 1 acre but are part of a larger common plan of development or sale to develop a Stormwater Pollution Prevention Plan (SWPPP). The plan must describe how the permittee will effectively design, install, and maintain effective erosion controls, sediment controls, and pollution prevention measures appropriate for the site conditions. Plans should be designed and maintained to minimize erosion and maximize sediment removal (Florida DEP 2017a).
- o The 125 FW installation is covered under Jacksonville IAP's Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity. To comply with the Multi-Sector Generic Permit, the Jacksonville Aviation Authority has prepared an operational SWPPP (Jacksonville Aviation Authority 2016). The SWPPP is intended to be used by Jacksonville IAP and its tenants to provide consistent and effective management of stormwater runoff. The SWPPP was developed to facilitate compliance for affected tenants and provides a discussion of potential pollutant sources resulting from practices and activities at the Jacksonville IAP. The SWPPP also identifies best management practices (BMPs) to reduce or eliminate pollutants from entering the stormwater system or surface waters (Jacksonville Aviation Authority 2016). The existing SWPPP already in place for the installation (Jacksonville Aviation Authority 2016) would be amended, as necessary, to reflect post-construction operations and potentially new BMPs.
- Federal projects with a footprint larger than 5,000 SF must maintain predevelopment hydrology and prevent any net increase in stormwater runoff as outlined in Unified Facilities Criteria (UFC) 3-210-10, *Low Impact Development*, and consistent with the U.S. Environmental Protection Agency's (USEPA's) *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects* under Section 438 of the Energy Independence and Security Act (EISA) of 2007.
- As applicable, the 125 FW will coordinate with the USEPA, Region IV and Florida DEP regarding proposed construction near Environmental Restoration Program (ERP) sites, including potential release locations (PRLs) of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), on the 125 FW installation.
- A conformity applicability determination is required for federal actions occurring in nonattainment or maintenance areas for criteria pollutants when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed *de minimis* thresholds. Duval County is an attainment zone for all criteria pollutants, though adjacent Nassau County is in nonattainment for sulfur dioxide (SO₂). However, aircraft would not traverse Nassau County lower than 3,000 feet AGL (the

generally accepted mixing height). Therefore, a conformity determination would not be required. Personnel conducting construction and/or demolition activities will strictly adhere to all applicable occupational safety requirements during construction activities.

• Sampling for asbestos-containing material (ACM) and lead-based paint (LBP) would occur prior to demolition and renovation activities for those buildings not previously tested; all materials would be handled in accordance with USAF policy. If ACM or LBP is present, the 125 FW would employ appropriately trained and licensed contractors to perform the ACM and/or LBP removal work and would notify the construction contractors of the presence of ACM and/or LBP so that appropriate precautions could be taken to protect the health and safety of the workers.

Some of the construction and modifications would require prior Federal Aviation Administration (FAA) approval of a change to the airport's Airport Layout Plan. Before providing such approval, the FAA would have to comply with NEPA.

Consultation. An initial consultation letter was sent to the Florida and Georgia State Historic Preservation Offices (SHPOs) in February 2018. Consultation will continue through the Environmental Impact Analysis Process (EIAP).

Government-to-Government. An initial phone call to Tribal offices to verify contact information and current Senior-level Tribal Officials before any materials were mailed to the American Indian Tribe was completed in late October/early November 2017. An initial government-to-government consultation letter was sent to 10 federally-recognized American Indian Tribes with ancestral ties to the 125 FW installation and lands beneath the associated airspace in February 2018. These 10 American Indian Tribes included Miccosukee Tribe of Indians, Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Tribe of Florida, Cherokee Nation of Oklahoma, Eastern Band of Cherokee Indians, Choctaw Nation of Oklahoma, Chickasaw Nation of Oklahoma, Seminole Nation of Oklahoma, and United Keetoowah Band of Cherokee Indians. After the initial government-to-government consultation letter was sent, NGB followed up with telephone calls and emails in an effort to increase accessibility and encourage communication in the event an American Indian Tribe would have any concerns regarding the Proposed Action or land below the affected airspace areas. No American Indian reservations underlie the airspace associated with the 125 FW.

The Seminole Nation of Oklahoma responded via e-mail that they would like to be included in any consultation pursuant to the Proposed Action, and also requested that a full flora inventory be conducted in each area of interest. The Seminole Nation of Oklahoma also requested a face-to-face meeting to discuss the project (Isham 2018).

The Cherokee Nation of Oklahoma mentioned on a follow-up phone call that the 125 FW airspace is not in their area of concern (AOC) so there is no need to send any further correspondence regarding this alternative (Toombs 2018).

To date, no other responses have been received from federally-recognized Tribes associated with the 125 FW installation.

FL2.5 PUBLIC INVOLVEMENT / AGENCY CONCERNS

FL2.5.1 Scoping

A scoping meeting was held on March 13, 2018 in Jacksonville, Florida. There were four people that attended the scoping meeting and three comments were received from the public and agencies prior to close of the scoping period (one Tribe and two general public). Of the two general public comments, one person was in support of the proposed beddown, and one expressed concerns about noise.

FL2.5.2 Draft Environmental Impact Statement Public Comment Period

A Draft Environmental Impact Statement (EIS) public meeting was held on August 27, 2019 in Jacksonville, Florida. There were three people that attended the meeting and two comments were received from the public and agencies with regard to the Proposed Action at Jacksonville prior to close of the comment period. Both of these comments were in support of the proposed beddown. See Section 1.6 of the EIS for more details on the public involvement process. See Appendix A6 for a summary of responses to comments on the Draft EIS.

FL2.6 MITIGATION

Compensatory mitigation and federal permitting and state water quality certification, in accordance with Sections 401 and 404 of the CWA, would be necessary for any future construction activities affecting wetlands. State of Florida permitting under Chapter 62-330, Florida Administrative Code, known as the Statewide Environmental Resource Permit Rule, would also be necessary for any future construction activities affecting these wetlands. Since the proposed projects involve construction in a wetland, a Finding of No Practicable Alternative would be required.

Upon completion of the Final EIS, a mitigation plan will be prepared in accordance with 32 Code of Federal Regulations (CFR) 989.22(d). The mitigation plan will address specific mitigations identified and agreed to during the EIAP, as discussed in the EIS and identified in the Record of Decision (ROD). The Mitigation and Monitoring Plan will be developed for those installations chosen, and will include metrics to track and monitor those activities that are identified to minimize

the impacts. These could include afterburner usage, flight tracks, number of operations, etc. The Mitigation and Monitoring Plan will identify who is responsible for implementing specific mitigation procedures, who is responsible for funding them, and who is responsible for tracking these measures to ensure compliance.

FL3.0 125TH FIGHTER WING AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

FL3.1 NOISE

The following sections present the noise environment generated by military and civil/commercial aircraft operations around the airfield, followed by an evaluation of the noise generated by military aircraft in training airspace. Both the affected environment and the Proposed Action Alternative (environmental consequences) are analyzed and the results presented. For purposes of this analysis, the No Action Alternative is the same as the affected environment, whereby no F-35A aircraft would be beddown at the installation and operations would continue as presented.

FL3.1.1 Installation

The USAF and ANG specify use of the NOISEMAP software program suite to model noise exposure at and around military air bases for military aircraft activity, while the FAA requires the Aviation Environmental Design Tool (AEDT) to model commercial and civil aircraft operations at and around airfields. To comply with both organizations' requirements, the noise analysis utilized both software models for the 125 FW installation.

The affected environment reflects civil/commercial aircraft operations derived from radar data, provided by the Jacksonville Airport Authority, covering all operations from November 2016 through October 2017. The data includes location and altitude for all aircraft operating around the Jacksonville IAP every few seconds, which allowed for determination of runway assignments. Aircraft types comprising 1 percent or more of total operations were modeled directly while the remaining aircraft were grouped by type and size and represented by the aircraft most common within each group. Interviews with members of the 125 FW provided updates to the military flight operations to reflect current operational conditions.

Noise modeling utilized annual average day (AAD) aircraft operations computed by dividing the total yearly airport operations by 365 days per year. The noise modeling relies on aircraft's flight tracks (paths over the ground) and profiles (which includes altitude, airspeed, power settings, and other flight conditions). The noise analysis considers the numbers of each type of operation by aircraft/track/profile, local climate, terrain surrounding the airfield, and similar data related to aircraft engine runs that occur at specific static locations on the ground (e.g., pre- and post-flight and maintenance activities). A team primarily made up of representatives from the installation's flying squadrons and air traffic controllers, as well as the NGB, developed this data through iterative meetings and discussions subsequently compiled into a data validation package. The NGB team reviewed the data validation package and approved the operational details for modeling (125 FW 2019).

FL3.1.1.1 Affected Environment

For the noise analysis at and around the 125 FW installation, the affected environment is the area that experiences noise generated by aircraft operations. These areas include along taxiways, runways, engine run sites, and in adjacent airspace where aircraft operating at the airfield transit along flight routes, approach or depart the airfield, and conduct closed pattern operations.

Table FL3.1-1 summarizes the modeled annual military flight operations of F-15C aircraft based at the 125 FW installation as well as military aircraft that visit the airfield, referred to as 'transients.' Table FL3.1-2 summarizes the modeled current annual civil/commercial (e.g., 747, 767, A300, regional jets) flight operations that operate out of Jacksonville IAP. Between November 2016 and October 2017 there were 101,653 flight operations at Jacksonville IAP, just over 92 percent are civil/commercial aircraft; military aircraft account for just under 8 percent. Of the military aircraft, the F-15 conducts the most flight operations (4,850), or about 5 percent of the total for the airport. The F-15 utilizes afterburner during 70 percent of departures and military power for the remainder. Individual flight profiles have been modeled for the two departure types.

 Table FL3.1-1. Annual Airfield Operations for Based and Transient Military Aircraft at

 Jacksonville IAP – Current

Aircraft Type	Modeled As	Arrivals Day 0700- 2200	Arrivals Night 2200- 0700	Departures Day 0700-2200	Departures Night 2200-0700	Closed Patterns Day 0700- 2200	Closed Patterns Night 2200- 0700	Total Day 0700- 2200	Total Night 2200- 0700	Total
Based Military										
Aircraft										
F-15C	F-15C	2,302	98	2,352	48	50	0	4,704	146	4,850
Transient										
Military										
Aircraft										
P-8	P-8	230	0	230	0	920	0	1,380	0	1,380
H-60	UH-60	305	0	305	0	1,219	0	1,829	0	1,829
	Total	2,837	98	2,887	48	2,189	0	7,913	146	8,059

Notes: For total airfield operations, a closed pattern includes two operations (one departure and one arrival). Totals may be off due to rounding.

0700 = 7 a.m.; 2200 = 10 p.m.

Source: 125 FW 2019.

Aircraft Type	Arrivals Day 0700- 2200	Arrivals Night 2200- 0700	Departures Day 0700-2200	Departures Night 2200-0700	Closed Patterns Day 0700- 2200	Closed Patterns Night 2200- 0700	Total Day 0700- 2200	Total Night 2200- 0700	Total
747400	12	5	13	3	0	0	25	8	33
767300	116	42	141	21	0	0	257	63	320
1900D	256	25	294	11	0	0	550	36	586
737800	4,535	1045	4,925	721	0	0	9,460	1,766	11,226
757RR	1,255	309	1,412	143	0	0	2,667	452	3,119
A300-622R	340	241	329	274	0	0	669	515	1,184
A319-131	1,804	232	1,910	132	0	0	3,714	364	4,078
A320-211	1,444	554	1,621	364	0	0	3,065	918	3,983
BEC58P	2,420	238	2,422	221	0	0	4,842	459	5,301
CL600	3,426	293	3,530	165	0	0	6,956	458	7,414
CNA172	217	39	265	25	1,160	50	1,642	114	1,756
CNA55B	1,662	90	1,687	73	0	0	3,349	163	3,512
CNA750	171	5	170	7	0	0	341	12	353
DC1010	228	198	403	19	0	0	631	217	848
DHC6	504	29	508	19	0	0	1,012	48	1,060
EMB145	492	123	514	100	0	0	1,006	223	1,229
GV	11,302	2,262	11,565	1,873	0	0	22,867	4,135	27,002
LEAR35	624	41	635	32	0	0	1,259	73	1,332
MD83	2,084	354	2,104	313	0	0	4,188	667	4,855
MD9028	387	131	426	67	0	0	813	198	1,011
MU3001	605	53	643	26	0	0	1,248	79	1,327
PA28	614	56	703	38	8,402	645	9,719	739	10,458
SF340	789	3	809	6	0	0	1,598	9	1,607
TOTAL	35,287	6,368	37,029	4,653	9,562	695	81,878	11,716	93,594

Table FL3.1-2.	Annual Airfield Operations for Civil/Commercial Aircraft at Jacksonville
	IAP – Current

Notes: For total airfield operations, a closed pattern includes two operations (one departure and one arrival). Totals may be off due to rounding.

0700 = 7 a.m.; 2200 = 10 p.m.

Source: 125 FW 2019.

Noise Exposure

Noise exposure computed with the NOISEMAP software program is presented graphically in a plot of contour lines of Day-Night Average Sound Level (DNL), a table of DNL at specific noise-sensitive representative locations, and counts of on- and off-airport acreages within each noise contour.

Figure FL3.1-1 and Table FL3.1-3 present a graphical depiction and tabular description of the 12 points of interest (POIs), representing a cross section of nearby schools, places of worship, and daycare centers which inform on the adjacent residential area conditions. This is not intended to be an exhaustive list of POIs, but rather representative. The Pecan Park Baptist Church and St. Demiana Coptic Orthodox Church experience DNL between 60 and 65 decibels (dB) while no locations are exposed to DNL greater than 65 dB.



Source: 125 FW 2019.

POI Number	Description	DNL (dBA)
1	Veronica Crider's Family Daycare	55
2	The Learning Experience	51
3	Baptist Health – North Medical Campus	38
4	University of Florida Health North	56
5	Pecan Park Baptist Church	60
6	St. Demiana Coptic Orthodox Church	62
7	Oceanway Assembly of God	47
8	Garden City Elementary	40
9	Oceanway Elementary	45
10	Oceanway 7 th Grade Center	48
11	Country School	46
12	Biscayne Elementary	47
Lagand dD	A - A weighted desibel: DNI - Dev Night Average	Sound Lough

Table FL3.1-3. DNL at Representative Points of Interest – Current

Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest.

Source: 125 FW 2019.

Figure FL3.1-2 shows the DNL contours for the affected environment at Jacksonville IAP, in 5 dB increments from 65 to 85 dB DNL. As shown, the 65 dB DNL contour extends outside of the airport boundary to the east off the end of Runway 08/26 and along the entire north side of the airport.

Table FL3.1-4 shows the acreage lying within noise contours of 65 to 85 dB DNL under the affected environment. Outside airport boundaries there are 2,264 acres within the 65 to 75 dB DNL noise contours and 178 acres within the 75 to 80 dB DNL.

DNL Level (dBA)	On Airport Property	Off-Airport Property	Total
65-70	760	1,739	2,499
70-75	762	525	1,287
75-80	553	178	731
80-85	386	0	386
85+	270	0	270
Total	2,731	2,442	5,173

Table FL3.1-4. Acreage within Noise Contours Bands – Current

Note: Totals may be off due to rounding.

Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level. *Source:* 125 FW 2019.



Source: 125 FW 2019.

Table FL3.1-5 presents noise exposure within each DNL contour band for off-airport household and population counts. According to the U.S. Census Bureau, households are defined as a house, an apartment, a mobile home, a group of rooms, or a single room occupied (or if vacant, intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live separately from any other people in the building and that have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people sharing living quarters (U.S. Census Bureau 2010). Contour bands were overlaid over aerial imagery and household buildings within each 5 dB contour band were counted manually. Buildings intersected by contour lines were counted as if exposed to the higher of the two bands. The number of people per household was determined independently for each U.S. Census Bureau 2010). Adopting this methodology gives a more accurate estimate of the number of people who may be exposed to noise levels within the noise contour band. Exposure to noise levels of 65 dB DNL and greater includes an estimated 15 people and 4 households.

Contour Band (dB DNL)	Population	Households
65–70	15	4
70–75	0	0
75–80	0	0
80-85	0	0
85+	0	0
Total	15	4

Table FL3.1-5. Off-Airport Noise Exposure withinCurrent Contour Bands at Jacksonville IAP

Legend: dB = decibel; DNL = Day-Night Average Sound Level.

Supplemental Metrics

To supplement the cumulative metric analysis, the greatest single-event sound exposure levels (SELs) are provided for each POI, as listed in Table FL3.1-6. SEL accounts for both the magnitude and duration of individual events, making it a good metric to compare disparate noise events. Table FL3.1-6 also includes the corresponding number of weekly events as well as the DNL values for reference. For instance, at POI #4 (University of Florida Health North) the current DNL is 56 dB with a maximum SEL of 105 with almost 3 events per week. Almost all of the loudest SELs are due to the based F-15C aircraft at the 125 FW installation, and that the loudest events tend to occur closest to the airfield and nearest the flight tracks that align with the airport runways.

Map ID	Named Point of Interest	DNL	SEL (dBA)	Average Number Per Week (Day)	Average Number Per Week (Night)
1	Veronica Crider's Family Daycare	55	106	2.7	0.1
2	The Learning Experience	51	100	2.7	0.1
3	Baptist Health North Medical Campus	38	82	0.0	0.0
4	University of Florida Health North	56	105	2.7	0.1
5	Pecan Park Baptist Church	60	100	24.2	0.5
6	St. Demiana Coptic Orthodox Church	62	103	24.2	0.5
7	Oceanway Assembly of God	47	93	0.0	0.1
8	Garden City Elementary	40	86	2.7	0.1
9	Oceanway Elementary	45	94	0.0	0.1
10	Oceanway 7th Grade Center	48	97	0.0	0.1
11	Country School	46	97	0.0	0.0
12	Biscayne Elementary	47	98	0.0	0.0

Table FL3.1-6. Loudest Events at Each POI, Calculated in SEL – Current

Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest; SEL = Sound Exposure Level.

Classroom Speech Interference. To evaluate the potential for classroom learning interference, the Equivalent Noise Level (L_{eq}) was computed for daytime events. Additionally, the number of events above (NA) 50 dB were tabulated as well as the duration of time above 50 dB for an average school day and presented in Table FL3.1-7. Under the affected environment, there are no POIs that have L_{eq} values over 60 dB, the nearest—Veronica Crider's Family Daycare (POI #1)—has an L_{eq} value of 56 dB.

POI Number	Named POI	L _{eq(8)} Screening for Sample Classroom Locations (dBA)	Number of Events Speech Interfering events per School Day (hour) ¹	Time Above 50 dBA per 8-hour School Day (minutes) ¹
1	Veronica Crider's Family Daycare	56	<1	1
2	The Learning Experience	52	<1	1
8	Garden City Elementary	40	<1	<1
9	Oceanway Elementary	45	<1	<1
10	Oceanway 7th Grade Center	48	<1	<1
11	Country School	47	<1	<1
12	Biscayne Elementary	48	<1	<1

 Table FL3.1-7.
 Classroom Speech Interference – Current

Note: ¹Assumes even distribution of daytime operations throughout the day.

Legend: dBA = A-weighted decibel; $L_{eq(8)}$ = 8-Hour Equivalent Noise Level; POI = Point of Interest. *Source:* 125 FW 2019.

The NA represents the average number of potential speech interfering events per school day hour. A speech-interrupting event is one that exceeds 50 dB indoors because this is the level at which speech intelligibility decreases. As depicted in Table FL3.1-7, under the affected environment the number of speech interference events per hour range from 0 to 1 event per hour at all locations.

Another approach in evaluating classroom speech interference is calculating the time above the 50 dB interior threshold. Under the affected environment, time above 50 dB ranges from less than a minute at Garden City Elementary (POI #8) to more than 1 minute at Veronica Crider's Family Daycare (POI #1) and The Learning Experience (POI #2).

Residential Speech Interference. Residential Speech Interference considers the number of hourly interruptions likely to interfere with speech-related activities (i.e., conversation and watching television) during a 15-hour day (from 7 a.m. until 10 p.m.). Interior levels of 50 dB represent the threshold for counting interference during the daytime. This analysis uses standard values for building attenuation of 15 dB for windows opened and 25 dB for windows closed conditions. Table FL3.1-8 summarizes the results of this analysis for all 12 POIs. Typically this metric is applied only to residential locations but many of the other location types (i.e., school and places of worship) are located within or adjacent to residential areas so their computed results represent the nearby residences. No locations experience two or more interfering events per hour and three POIs (Veronica Crider's, Pecan Park Baptist Church, and St. Demiana Coptic Orthodox Church) experience one event per hour with windows open. Only Pecan Park Baptist Church is exposed to one speech interfering event per hour for windows closed conditions.

POI Number	Named POI	Windows Open ^{1, 2}	Windows Closed ^{1, 3}
1	Veronica Crider's Family Daycare	1	0
2	The Learning Experience	0	0
3	Baptist Health North Medical Campus	0	0
4	University of Florida Health North	0	0
5	Pecan Park Baptist Church	1	1
6	St. Demiana Coptic Orthodox Church	1	0
7	Oceanway Assembly of God	0	0
8	Garden City Elementary	0	0
9	Oceanway Elementary	0	0
10	Oceanway 7th Grade Center	0	0
11	Country School	0	0
12	Biscayne Bay Elementary	0	0
Notes:	¹ Assumes 15 dB attenuation. ² Assumes 25 dB attenuation. ³ Assumes even distribution of daytime operation	ons throughout the day.	

Table FL3.1-8. Residential Speech Interference Events (Daytime) – Current

Sleep Disturbance. For residential areas, a common concern is the possibility of sleep disturbance, or the probability of awakening. Table FL3.1-9 shows the cumulative probability of awakening at least once during that period for both a windows closed and windows open conditions. While residences may not be present at each of the POIs, the points are good representations of the noise environment in their immediate vicinity.

POI = Point of Interest.

125 FW 2019.

Legend:

Source:

Under the affected environment, all of the POI locations show a less than 1 percent chance of waking either with windows opened or windows closed. The low probability of awakening is primarily due to few nighttime flight operations in general and minimal nighttime flights by the relatively loud F-15C.

POI Number	Named POI	Windows Open ¹	Windows Closed ²
1	Veronica Crider's Family Daycare	<1%	<1%
2	The Learning Experience	<1%	<1%
3	Baptist Health North Medical Campus	<1%	<1%
4	University of Florida Health North	<1%	<1%
5	Pecan Park Baptist Church	<1%	<1%
6	St. Demiana Coptic Orthodox Church	<1%	<1%
7	Oceanway Assembly of God	<1%	<1%
8	Garden City Elementary	<1%	<1%
9	Oceanway Elementary	<1%	<1%
10	Oceanway 7th Grade Center	<1%	<1%
11	Country School	<1%	<1%
12	Biscayne Elementary	<1%	<1%
Notes: 1	Assumes 15 dB attenuation.		

 Table FL3.1-9.
 Probability of Awakening – Current

Legend: POI = Point of Interest.

Source: 125 FW 2019.

Potential for Hearing Loss. Potential for Hearing Loss (PHL) applies to people living in high noise environments. The threshold for assessing PHL is exposure to noise greater than 80 dB DNL. Under the affected environment, there are no residential areas on or adjacent to the airport that are exposed to contour bands of 80 dB DNL or greater (see Table FL3.1-5), so PHL does not apply.

Occupational Noise. USAF occupational noise exposure prevention procedures, such as hearing protection and monitoring, are currently used and comply with all applicable Occupational Safety and Health Administration (OSHA) and USAF occupational noise exposure regulations.

Other Noise Sources. Other generators of noise, such as vehicle traffic, and other maintenance and landscaping activities, are a common ongoing occurrence at Jacksonville IAP. While these sources may contribute to the overall noise environment, they are not distinguishable from aircraft-generated noise at and adjacent to the airport. For this reason, these other noise sources were not considered under the affected environment nor are they analyzed under environmental consequences.

FL3.1.1.2 Environmental Consequences

Proposed Action

The Proposed Action Alternative would beddown 18 F-35A aircraft at the 125 FW installation and replace the F-15s. Proposed annual F-35A flight operations total 6,222, about 1,372 more operations when compared to current F-15 operations (or the No Action Alternative). The civil operations were determined to continue relatively unchanged through the Proposed Action implementation. The F-35A aircraft would account for approximately 6 percent of the airport total. Other than an occasional arrival or departure (about 214), F-35As would not be expected to operate after 10 p.m. or before 7 a.m. The Proposed Action Alternative would introduce slightly more F-35A operations per year when compared to the F-15C that it is replacing; however, F-35A would use afterburner on up to 5 percent of departures and military power on the remainder. Individual flight departure flight profiles have been modeled for the two departure types.

Noise Exposure

Figure FL3.1-3 shows the DNL contours for the Proposed Action Alternative at Jacksonville IAP in 5 dB increments from 65 to 85 dB DNL. As shown, the 65 dB DNL contour extends outside of the airport boundary similar to the affected environment found under the No Action Alternative. Figure FL3.1-4 shows the comparison between the No Action and Proposed Action Alternative DNL contours. Of note is the slight reduction of the 65 dB DNL contour to the east end of Runway 08/26, due in part to less frequent use of afterburner for departures of the F-35A, when compared to that of the F-15. The reduction in length of the contour lobes to the east and south would be due to the F-35A climbing to higher altitudes quicker than the F-15 in these areas, which causes reduced sound levels at ground level.

Table FL3.1-10 lists the computed DNL for each of the 12 POIs under the Proposed Action Alternative. This table also shows the change in DNL when compared to the No Action Alternative. Under the Proposed Action Alternative, DNL values at the POIs would range from 39 dB to 61 dB. Of the 12 POI locations, only Pecan Park Baptist Church (POI #5) and St. Demiana Coptic Orthodox Church (POI #6), would experience noise levels equal to or greater than 60 dB DNL and no locations would be exposed to 65 dB DNL or greater. Noise levels at Pecan Park Baptist Church would remain unchanged relative to the No Action Alternative. DNL at St. Demiana Coptic Orthodox Church would decrease by 1 dB to 61 dB DNL. Across the POIs, changes in DNL value would range from -1 to +1 dB DNL but remain below 65 dB DNL for all locations analyzed under the Proposed Action.



Source: 125 FW 2019.



Source: 125 FW 2019.

POI Number	Description	Proposed Action Alternative DNL (dB)	Change from Current in DNL (dB)
1	Veronica Crider's Family Daycare	55	0
2	The Learning Experience	52	+1
3	Baptist Health – North Medical Campus	39	+1
4	University of Florida Health North	55	-1
5	Pecan Park Baptist Church	60	0
6	St. Demiana Coptic Orthodox Church	61	-1
7	Oceanway Assembly of God	47	0
8	Garden City Elementary	39	-1
9	Oceanway Elementary	46	+1
10	Oceanway 7 th Grade Center	49	+1
11	Country School	45	-1
12	Biscayne Elementary	46	-1

Table FL3.1-10. Proposed Action Alternative DNL at Points of Interest

Legend: dB = decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest. *Source:* 125 FW 2019.

Table FL3.1-11 presents the estimated on- and off-airport acreage, population, and households within each 5-dB DNL contour band. When compared to the No Action Alternative, off-airport, there would be 688 fewer acres, 15 fewer people, and 4 fewer households experiencing DNL equal to or greater than 65 dB. The primary cause for this decrease would be because the F-35A would climb quicker during departure than the F-15C aircraft that it would replace. The greater altitude of the F-35A would generate lesser noise levels beyond airport property and in residential neighborhoods.

DNL (dB)	Proposed Action Alternative Acreage	Proposed Action Alternative Estimated Population	Proposed Action Alternative Households	Change from Current Acreage	Change from Current Estimated Population	Change from Current Households
65 - 70	1,398	0	0	-341	-15	-4
70 - 75	343	0	0	-182	0	0
75 - 80	13	0	0	-165	0	0
80 - 85	0	0	0	0	0	0
85+	0	0	0	0	0	0
Total	1,754	0	0	-688	-15	-4

Table FL3.1-11. Proposed Action Alternative Off-Airport Noise Exposure

Legend: dB = decibel; DNL = Day-Night Average Sound Level

Supplemental Noise Metrics

Consistent with the affected environment supplemental analysis, single-event SELs are provided at each POI for the three greatest noise events for each POI. Table FL3.1-12 shows the aircraft events producing the greatest sound exposure levels at the airport along with the resulting SEL and weekly events during environmental daytime and nighttime hours. Also included are the DNL values at the POIs for reference. Under the Proposed Action Alternative, the greatest SELs at the representative POIs would be generated by F-35A events, which would be similar to the existing F-15C and up to 3 dB less. Table FL3.1-12, showing only the top noise contributor at each POI, suggests that the F-35A would generate nearly twice as many loud events as currently occur in the affected environment. However, because both the F-15C under the affected environment and the F-35A under the Proposed Action have been modeled with separate departure profiles for military power and afterburner, there exists a second top contributor of similar SEL. Once the events from both departure flight profiles are considered, the number of loud events under the Proposed Action would increase roughly by 25 percent relative to the No Action conditions. The loudest events would continue to occur closest to the airfield and nearest the departure flight tracks that align with the airport runways.

Classroom Learning Interference. As noted under affected environment, seven of the 12 POIs identified near the airport are schools or daycare centers. Table FL3.1-13 lists these points along with the calculation of the various metrics with the windows open. There are no POIs that would be exposed to L_{eq} values over 60 dB for the Proposed Action Alternative. L_{eq} would decrease for four schools and increase for the remaining three. The differences range from -1 to +1 dBA.

When compared to the No Action Alternative, the number of interfering events would increase by 1 at The Learning Experience (POI #2) while all other locations would not experience a change. Time above interior 50 dB under the Proposed Action Alternative would range from less than 1 minute to up to 2 minutes per day at The Learning Experience (POI #2). This would represent an approximate increase of 1 minute per day relative to the No Action condition.

Residential Speech Interference. Residential Speech Interference examines the number of events generating interior levels above 50 dB, as tabulated in Table FL3.1-14. The table presents the number of indoor speech interfering events per hour, both with windows open and closed, using a standard value for building attenuation of 15 dB and 25 dB, respectively. In the windows closed condition POIs would experience an increase of residential speech interference events of no more than one per hour under the Proposed Action Alternative.

Map ID	Named Point of Interest	Current DNL	Current SEL (dBA)	Current Average Events Per Week (Daytime)	Current Average Events Per Week (Night)	Proposed Action DNL	Proposed Action SEL (dBA)	Proposed Action Average Events Per Week (Daytime)	Proposed Action Average Events Per Week (Night)
1	Veronica Crider's Family Daycare	55	106	2.7	0.1	55	103	4.6	0.1
2	The Learning Experience	51	100	2.7	0.1	52	100	4.6	0.1
3	Baptist Health North Medical Campus	35	82	0.0	0.0	37	82	2.7	0.1
4	University of Florida Health North	56	105	2.7	0.1	56	103	4.6	0.1
5	Pecan Park Baptist Church	60	100	24.2	0.5	60	99	41.8	0.9
6	St. Demiana Coptic Orthodox Church	62	103	24.2	0.5	61	101	41.8	0.9
7	Oceanway Assembly of God	47	93	0.0	0.1	47	92	0.0	0.1
8	Garden City Elementary	38	86	2.7	0.1	38	84	0.2	0.0
9	Oceanway Elementary	45	94	0.0	0.1	46	94	0.0	0.1
10	Oceanway 7th Grade Center	48	97	0.0	0.1	49	96	0.0	0.1
11	Country School	45	97	0.0	0.0	44	92	4.6	0.1
12	Biscayne Elementary	47	98	0.0	0.0	46	98	0.0	0.0

Table FL3.1-12. I	Loudest Events at Each	Jacksonville IAP POI,	Measured in SEL – P	roposed Action Alternative
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Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest; SEL = Sound Exposure Level.
POI Number	Named POI	Outdoor L _{eq(8)} (dBA) Current	Outdoor L _{eq(8)} (dBA) Proposed	Outdoor L _{eq(8)} (dBA) Change Relative to Current	Number of Events Interrupting Speech per School Day (hour) ¹	Time above 50 dBA per 8-hour School Day (minutes) ¹
1	Veronica Crider's Family Daycare	56	56	0	0	1
2	The Learning Experience	52	53	+1	1	2
8	Garden City Elementary	40	40	0	0	<1
9	Oceanway Elementary	45	46	+1	0	1
10	Oceanway 7th Grade Center	48	49	+1	0	<1
11	Country School	47	46	-1	0	<1
12	Biscayne Elementary	48	47	-1	0	<1

 Table FL3.1-13.
 Classroom Speech Interference – Proposed Action Alternative

Note: ¹Assumes even distribution of daytime operations throughout the day.

Legend: dBA = A-weighted decibel; $L_{eq(8)} = 8$ -Hour Equivalent Noise Level; POI = Point of Interest. *Source:* 125 FW 2019.

Table FL3.1-14.	Residential St	peech Interference	Events – Propos	ed Action	Alternative
	itestucintial Sp		Lichts Hopos		Mitel matrix c

POI Number	Named POI	Windows Open ^{1, 2} Proposed Action	Windows Closed ^{1, 3} Proposed Action	Windows Open ^{1, 2} Change	Windows Closed ^{1, 3} Change
1	Veronica Crider's Family Daycare	1	0	0	0
2	The Learning Experience	0	1	0	+1
3	Baptist Health North Medical Campus	0	0	0	0
4	University of Florida Health North	1	1	+1	+1
5	Pecan Park Baptist Church	1	1	0	0
6	St. Demiana Coptic Orthodox Church	1	1	0	+1
7	Oceanway Assembly of God	1	0	+1	0
8	Garden City Elementary	0	0	0	0
9	Oceanway Elementary	1	0	+1	0
10	Oceanway 7 th Grade Center	0	0	0	0
11	Country School	1	0	+1	0
12	Biscayne Bay Elementary	1	0	+1	0

Notes: ¹Assumes even distribution of daytime operations throughout the day.

²Assumes 15 dB attenuation.

³Assumes 25 dB attenuation.

Legend: POI = Point of Interest.

Source: 125 FW 2019.

Sleep Disturbance. Table FL3.1-15 shows the probability of awakening for each POI by consistent with the American National Standards Institute (ANSI) standard S12.9 methodology used in the affected environment analysis. Note that while residences may not be present at each of the POIs, the points serve as good representations of the noise environment in the immediate vicinity, which often include residences. Under the Proposed Action Alternative, all of the POI locations show a less than 1 percent chance of awakening under windows opened or windows

closed conditions. Due to the relatively low number of night operations, the change in probability of awakening from No Action compared to the Proposed Action Alternative would be negligible.

POI Number	Named POI	Windows Open ¹	Windows Closed ²
1	Veronica Crider's Family Daycare	<1%	<1%
2	The Learning Experience	<1%	<1%
3	Baptist Health North Medical Campus	<1%	<1%
4	University of Florida Health North	<1%	<1%
5	Pecan Park Baptist Church	<1%	<1%
6	St. Demiana Coptic Orthodox Church	<1%	<1%
7	Oceanway Assembly of God	<1%	<1%
8	Garden City Elementary	<1%	<1%
9	Oceanway Elementary	<1%	<1%
10	Oceanway 7th Grade Center	<1%	<1%
11	Country School	<1%	<1%
12	Biscayne Elementary	<1%	<1%

Table FL3.1-15. Probability of Awakening – Proposed Action Alternative

Notes: ¹Assumes 15 dB attenuation. ²Assumes 25 dB attenuation. *Legend:* POI = Point of Interest. *Source:* 125 FW 2019.

Potential for Hearing Loss. Under the Proposed Action Alternative, no residential areas on or adjacent to Jacksonville IAP would be exposed to DNL greater than or equal to 80 dB. Therefore, a PHL is not anticipated due to the Proposed Action. This conclusion is justified because permanent hearing loss due to noise exposure would generally require daily exposure over 40 years or longer to DNL greater than or equal to 80 dB.

Occupational Noise. NGB occupational noise exposure prevention procedures, such as hearing protection and monitoring, would continue to be applied under the Proposed Action Alternative. These procedures would comply with all applicable OSHA and NGB occupational noise exposure regulations and ensure no significant adverse impacts under the Proposed Action Alternative.

Other Noise Sources. Noise is an unavoidable, short-term byproduct of construction activities. The major noise events for this construction would take place inside airport boundaries at the 125 FW installation with only a negligible increase in traffic noise caused by vehicles entering and exiting the airport for construction deliveries and work force arrivals and departures. During construction, steps would be taken to minimize any impacts. These include making sure all equipment is in good operating condition, with an emphasis on maintenance of mufflers, bearings, and moving machinery parts. Stationary equipment with a potential to emit noise would be placed away from sensitive noise receivers. Whenever possible, noise events would be scheduled to avoid noise-sensitive times. Construction workers would comply with OSHA exposure regulations to ensure no significant adverse effects from noise exposure.

No Action Alternative

Under the No Action Alternative, the acoustic environment at and around the airport would not differ from the conditions presented under the affected environment. Therefore, refer to Section FL3.1.1.1 for noise exposure and supplemental noise metrics. Impacts under the No Action Alternative would not be significant.

FL3.1.2 Airspace

The U.S. Government prescribes the use of the Onset-Rate Adjusted Monthly DNL (L_{dnmr}) for aircraft noise analysis in the SUA environment. L_{dnmr} is based on the month with the most aircraft activity in each airspace unit to account for the sporadic nature of operations. L_{dnmr} is similar to the DNL except that an additional penalty is applied to account for the startle effect of aircraft operating at low altitudes and at high rates of speed (over 400 knots) generating quick sound level increases. The penalty is calculated from the rate of increase in sound level and varies from 0 to 11 dB. Noise modeling, using MR_NMAP, was accomplished by determining the operations in each airspace unit and building each aircraft's flight profiles (airspeed and power setting) and the amount of time spent at various altitudes throughout the airspace.

In rural and open areas, the analysis of noise impacts are vastly different compared to areas near population centers. In these areas, public concerns can include effects to wildlife, domestic animals, natural sounds, and outdoor recreation. Although many studies have been conducted on noise impacts to animals, if the animal of concern has not been included in any of these studies, biological expertise is required to determine if additional research is required or a surrogate animal can be used for the assessment of impacts. See Section FL3.11, *Biological Resources* for a discussion of noise impacts to wildlife.

FL3.1.2.1 Affected Environment

The 125 FW primarily uses the over water Warning Areas for training; however, occasional training does occur in over land SUA in the Coastal/Townsend and Palatka/Pinecastle airspace complex (see Figure FL2.2-1). Under the affected environment, there are up to 2,400 sorties per year in the airspace attributable to the F-15s of the 125 FW. The majority of the operations occur in the over water Warning Areas which were not modeled for noise analysis due to their distance from populated areas. Flight profile data for the F-15's were provided by representatives from the 125 FW.

Noise Exposure

Subsonic. Table FL3.1-16 shows the L_{dnmr} levels, rounded to whole decibels, for the affected environment within each of the respective MOAs/ATCAAs. The areas under the MOAs range

from 36 to 50 dB. These include noise contribution from the ATCAAs directly over them. The results are shown rounded to whole numbers.

Airspace Name	Airspace Units	L _{dnmr} (dB)
PALATKA1 ⁽¹⁾	Palatka 1, R-2910A/B/C/D/E	44
PALATKA2 ⁽¹⁾	Palatka 2	44
COASTAL1E/W25 ⁽²⁾	Coastal 1E, 1W, 2, 5 R-3007 A/B/C/D	50
COASTAL4 ⁽²⁾	Coastal 4	36
COASTAL8 ⁽²⁾	Coastal 8	38
COASTAL67 ⁽²⁾	Coastal 6, 7	37
Notes: ¹ Palatka 1 and 2 r	nodeling assumes aircraft have	full use of the

Table FL3.1-16. Ldnmr Beneath SUA – Affected Environment

Notes: ¹Palatka 1 and 2 modeling assumes aircraft have full use of the MOA when R-2910 inactive.
 ²Modeling includes profiles extending above published MOA into overlaying ATCAA.
 Legend: dB = decibel; L_{dnnr} = Onset-Rate Adjusted Day-Night Average

Sound Level. Source: 125 FW 2019.

Supersonic. Supersonic operations are not approved for the Coastal/Townsend and Palatka/Pinecastle airspace complexes. Current supersonic flight activity by the 125 FW F-15Cs occurs in the Warning Areas, which are more than 12 NM offshore and consequently noise levels were not modeled because impacts would not affect populated areas.

FL3.1.2.2 Environmental Consequences

Proposed Action

This section presents noise conditions in the airspace and ranges that would be used by F-35A aircraft under the 125 FW Alternative. Under the Proposed Action Alternative, there would be an increase of up to 28 percent of sorties in the airspace, with each sortie lasting 30-60 minutes. Therefore, there would be an approximately 28 percent increase in the time spent in the airspace by 125 FW aircraft. All other aircraft operations would be unchanged from those described under the No Action Alternative. Although the F-35A would be expected to operate more often at higher altitudes than the F-15, no other changes in airspace or airspace use are proposed. The noise analysis accounts for subsonic flight operations and, consistent with current methodology, presented in L_{dnmr}.

Noise Exposure

Subsonic. Table FL3.1-17 shows the L_{dnmr} levels for the Proposed Action Alternative conditions within each of the respective MOAs and overlying ATCAAs. The areas under the MOAs would range from 37 to 49 dB. Under the Proposed Action Alternative, changes in noise levels range from -1 to +2 dB but still remain well below 65 dB L_{dnmr} . While the F-35A would fly more sorties

in these areas, they would do so at higher altitudes than the F-15Cs (in general), so the noise effect of the increased sorties is largely offset by use of higher altitudes. The largest change would be under the Palatka MOAs, which would increase by 2 dB from 44 to 46 dB L_{dnmr} .

The noise levels computed in Table FL3.1-17 represent only the military aircraft contributions to sound levels and does not consider other sources, such as road traffic and wind. Typical ambient L_{dnmr} for 'quiet suburban residential' areas range from 49 to 52 dB while rural is typically less than 49 dB (ANSI 2013). Although Palatka 1 and 2 would experience increases in L_{dnmr} due to aircraft noise, the proposed level likely would not exceed current ambient levels when other noise sources are considered.

Airspace Name	Airspace Units	Proposed Action Alternative L _{dnmr} (dB)	Change in L _{dnmr} (dB)
PALATKA1 ⁽¹⁾	Palatka 1, R-2910A/B/C/D/E	46	+2
PALATKA2 ⁽¹⁾	Palatka 2	46	+2
COASTAL1E/W25 ⁽²⁾	Coastal 1E, 1W, 2, 5 R-3007 A/B/C/D	49	-1
COASTAL4 ⁽²⁾	Coastal 4	37	+1
COASTAL8 ⁽²⁾	Coastal 8	39	+1
COASTAL6,7 ⁽²⁾	Coastal 6, 7	38	+1

 Table FL3.1-17. Proposed Action Alternative Ldnmr Beneath SUA

Notes: ¹Palatka 1 and 2 modeling assumes aircraft have full use of MOA when R-2910 inactive. ²Modeling includes profiles extending above published MOA into overlaying ATCAA.

Legend: dB = decibel; L_{dnmr} = Onset-Rate Adjusted Day-Night Average Sound Level.

Source: 125 FW 2019.

Supersonic. Consistent with the affected environment, proposed supersonic F-35A operations would only occur in the over water Warning Areas currently used by the F-15C. These Warning Areas are more than 12 NM offshore and would not generate noise impacts to populated areas.

No Action Alternative

Under the No Action Alternative, the acoustic environment in the airspace would not differ from the conditions presented under the affected environment. Therefore, refer to Section FL3.1.2.1 for noise exposure.

FL3.1.3 Summary of Impacts

Under the Proposed Action at the 125 FW installation, F-35A aircraft operations at the installation would result in a decrease of off-airport acreage contained within the 65 dB DNL and greater noise contours by 688 acres. There would be an estimated reduction of 4 households and 15 fewer people that would reside within the 65 dB, and greater, DNL contours where residential land use is considered conditionally compatible. Predicted changes in the DNL at POIs range from -1 to +1 dB with levels at all representative locations remaining under 65 dB. Schools located within

the Region of Influence (ROI) would experience little change in L_{eq} (increase or decrease of 1 dB) and the number of events causing speech interference would not increase noticeably. The predicted increase in L_{dnmr} in SUA would range from -1 to +2 dB with the highest L_{dnmr} remaining below 50 dB. Additional discussion regarding noise impacts on factors such as health effects and noise-induced vibration effects can be found in Appendix B, *Noise Modeling, Methodology, and Effects*. Based on context and intensity, the change in the noise environment associated with the Proposed Action would not be considered significant in the area surrounding the airfield nor in the SUA.

FL3.2 AIRSPACE

FL3.2.1 Installation

FL3.2.1.1 Affected Environment

The 125 FW is located within the boundaries of Jacksonville IAP, a joint use airport, which lies 9 miles north of downtown Jacksonville (see Figure FL1.0-1). The airport is publicly owned by the Jacksonville Airport Authority with the FAA providing air traffic control (ATC) services for pilots operating in the local airspace. The airport has two runways, Runway 08/26 and Runway 14/32. The majority of military operations occur on Runway 08/26 with approximately 76 percent occurring on Runway 08 and the rest occurring on Runways 26/14/32. Civilian traffic uses all four runways. Aircraft operations into and out of Jacksonville IAP are controlled by FAA air traffic controllers who use the Class C airspace immediately surrounding the airfield, and the Class E extension airspace associated with the radar approach control area.

Several other public and private airfields are located in the vicinity of the Jacksonville IAP. Many airports are located within the Jacksonville metropolitan area. These include four publicly owned airports (Stimarys, Fernandina Beach, Jacksonville Executive at Craig, and Herlong), one private airport (Nassau), and three military airfields (Whitehouse Naval Outlying Field and Mayport Naval Station, and Jacksonville Naval Air Station).

The 125 FW currently flies and maintains 18 F-15C aircraft in support of its mission for the FLANG. From November 2016 to October 2017, a total of 101,653 operations were conducted at Jacksonville IAP, including 8,059 military operations and 93,594 civilian operations. Of the military aircraft, the F-15 conducts the most flight operations (4,850), or about 5 percent of the total for the airport. The F-15Cs based at the 125 FW installation have flown in this airspace environment for many decades.

FL3.2.1.2 Environmental Consequences

Proposed Action

The one-for-one replacement of F-15C military aircraft assigned to the 125 FW installation would not require changes in local airspace or airfield management. Eventual replacement of F-15C aircraft at 125 FW installation by the F-35A would result in an approximate increase in 125 FW military operations of 28 percent, and a 1 percent increase (approximately four airfield operations per average annual day) in total airfield operations from the affected environment (Table FL3.2-1). The minimal increase in operations would not adversely affect Jacksonville IAP Radar Approach Control or its control tower handling air traffic within the local airspace. No changes to the Jacksonville IAP terminal airspace arrival or departure procedures would be required to accommodate the F-35A. Therefore, impacts on airspace use in the local air traffic environment would not be significant.

125 FW Installation	Current	Proposed Airfield Operations
Based F-15C	4,850	0
Transients ¹	3,209	3,209
F-35A	0	6,222
Civilian/Commercial	93,594	93,594
Total	101,653	103,025
Percent Change from Current	-	+1%

Table FL3.2-1. Comparison of Current and Proposed Airfield Operations

Note: ¹Transients include P-8, UH-60. Legend: $125 \text{ FW} = 125^{\text{th}}$ Fighter Wing. Source: 125 FW 2019.

No Action Alternative

Under the No Action Alternative, the F-15s would continue to fly from Jacksonville IAP. No changes to the frequency of operations, or use of arrival or departure routes, would occur. Operations would remain as described in Section FL3.2.1.1. There would be no change in use of local airspace; therefore, no significant impacts would occur.

FL3.2.2 Airspace

As noted in Chapter 2, Section 2.1.2, F-35A aircraft would not use Military Training Routes, either to access the training airspace or conduct training. Therefore, this aspect of airspace use is not addressed in this EIS.

FL3.2.2.1 Affected Environment

The 125 FW currently uses several airspace units which consist of MOAs, Restricted Areas, ATCAAs, and Warning Areas (see Table FL2.2-1 and Figure FL2.2-1). The 125 FW F-15 aircraft currently conduct up to 2,400 annual sorties (or 200 monthly sorties) lasting between 30-60 minutes in the airspace. These airspace units would be used by the F-35A on a continuing basis for training. The 125 FW currently uses the Warning Areas off the Atlantic Coast to accomplish approximately 90 percent of their training. The other 10 percent of training occurs over land in MOAs, Restricted Areas, and ATCAAs. The scheduling agency for the Warning Areas is the U.S. Navy, Fleet Area Control and Surveillance Facility, Jacksonville, Florida and the controlling agency is the FAA, Jacksonville Air Route Traffic Control Center (ARTCC). The Warning Areas are published and charted from the surface to an unlimited altitude and with continuous use (24 hours per day, 365 days per year).

The scheduling agency for the Coastal MOA/Townsend Range complex is the Marine Corps Air Station, Beaufort, South Carolina, and the controlling agency is the FAA, Jacksonville ARTCC. A Letter of Agreement (LOA) between Jacksonville ARTCC, Savannah ATC Tower, the Savannah Combat Readiness Training Center, and Fleet Area Control and Surveillance Facility Jacksonville defines the procedures for use of the Coastal MOAs/ATCAAs and Restricted Area (R-) 3007A-D. The LOA defines the primary means of activation and deactivation for use of the Coastal MOAs as real-time coordination between Townsend Range, Jacksonville ARTCC, and Savannah ATC Tower (FAA 2006). The Coastal MOAs published times of use are intermittent from 7 a.m. through 10 p.m. Monday through Friday and intermittent from 7 a.m. to 10 p.m. Saturday and Sunday by Notice to Airmen (NOTAM). Hours of use per year in the Coastal 1 East, Coastal 2 West, and Coastal 2 MOAs are not to exceed 665. Hours of use in Coastal 4 and Coastal 5 MOAs are not to exceed 316 hours per year, and hours of use in Coastal 6, 7, and 8 MOAs are not to exceed 60 hours per year. The Coastal MOA/Townsend Range complex includes R-3007A, B, C and D with published times of use from 7 a.m. to 10 p.m. Monday through Friday and sunday through Friday with other usage by NOTAM at least 24 hours in advance.

The Pinecastle Range/Palatka MOA is part of the Navy's JAX Range Complex. Pinecastle Range is located in Marion County, Florida. The Fleet Area Control and Surveillance Facility Jacksonville manages the range's day-to-day maintenance and controls access, as well as schedules all the training activities occurring on the range. Presently, the range operates under the terms and conditions established in the Special Use Permit issued by the U.S. Forest Service. The Special Use Permit authorizes the Navy to use the land for the purpose of a bombing range as long as the terms of the Special Use Permit are executed to the satisfaction of the U.S. Forest Service (property owner). The range has normal operating hours Monday and Wednesday 10 a.m.-8 p.m., Tuesday and Thursday 9 a.m.-5 p.m., and Friday from 8 a.m.-12 p.m.

The FAA uses Air Traffic Service Routes to direct the flow of air traffic throughout the U.S. Victor (V) and Tango (T) routes are low-altitude airways in airspace below 18,000 feet MSL used by air traffic controllers to route air traffic between fixed locations. Routes V-157, V-179, and V-578, flow through the Coastal MOAs; no T-routes are published in the area. Jet and Q-Routes are published airways designated at altitudes between 18,000 feet MSL and 45,000 feet MSL. Three routes, J-53, J-81, and J-75 traverse above the Coastal MOA Complex. There are no Q-Routes designated above the Coastal MOA Complex.

Air Traffic Service Routes over the Atlantic Ocean are designed for air traffic flowing north and south along the Atlantic Coast. Their use allows air traffic controllers to deconflict commercial and military air traffic within the Warning Areas. There are several routes within the Warning Areas used to support the north/south flow of traffic: AR15-17-21, AR16, and AR19-22 are located primarily within eastern most portions of the Warning Area complex. East/west routes provide access to coastal airports such as Jacksonville (AR5) and Charleston (AR7-12-25). AR7-12-25 runs east and west through the center of W-161A and W161B and AR5 runs east-west through W-137D, W-138D, W-139.

Route Name	MEA ¹	Associated Airspace
V-157	None	Coastal MOA Complex
V-179	None	Coastal MOA Complex
V-578	None	Coastal MOA Complex
J-53	None	Coastal MOA Complex
J-81	None	Coastal MOA Complex
J-75	None	Coastal MOA Complex
AR15-17-21	None	W-161A/B
AR16	None	W-161A/B
AR19-22	None	W-161A/B
AR5	None	W-137D/138D/139D
AR7-12-25	None	W-161A/B

Table FL3.2-2. Air Traffic Service Routes in the Vicinity of the Training Airspace

Note: MEA as published in the vicinity of the training airspace *Legend:* MEA = Minimum Enroute Altitude.

As indicated in Table FL3.2-3, there are two public airports located beneath the Coastal MOA Complex. In addition, the Class D airspace supporting Vidalia Regional Airport and Claxton-Evans County Airport lie within the Coastal 8 and Coastal 6 MOAs, respectively. Commercial aircraft activity in Georgia and Florida has increased over the past 10 years and is expected to continue to grow (FAA 2018).

Airport Name	Airport Ownership	Associated MOA	Based Aircraft	Annual Operations
Swinton Smith Field at Reidsville Municipal Airport (RVJ)	Public	Coastal 8 MOA	6 – Single Engine 4 – Multi-Engine 1 – Helicopter	5,500
Jesup-Wayne County Airport	Public	Coastal 1 West MOA	12 – Single Engine 1 – Multi-Engine 2 – Ultralights	6,000

Table FL3.2-3.	Public and	Private A	virports in	the Vici	inity of the	e Training	Airspace
	I upite unu	I II VALUE I S	in por com		mity of the		1 m space

Legend: MOA = Military Operations Area.

Source: Skyvector 2018.

FL3.2.2.2 Environmental Consequences

Proposed Action

Selection of 125 FW installation for beddown of 18 F-35A operational aircraft would not result in adverse impacts on airspace use and management throughout this region. The Proposed Action Alternative would not require any changes to the current lateral or vertical configuration of the MOAs, Restricted Areas, Warning Areas, or ATCAAs, nor would it alter the normally scheduled times of use in the SUA or be expected to cause an exceedance of the hours of use permitted in the Coastal MOA Complex. Ninety percent of the proposed F-35A training would occur in the Warning Areas over the Atlantic Ocean that are already charted for continuous operation from the surface of the water to an unlimited altitude. Under the Proposed Action, there would be an increase of approximately 28 percent in the amount of time spent in the airspace under the Proposed Action (see Table FL2.2-3). The existing coordination requirements for this airspace use would remain in effect and the 125 FW would continue to be required to contact Marine Corps Air Station Beaufort, South Carolina, to schedule its use. The Marine Corps would continue to be responsible for following the terms contained in the agreement with the FAA.

Impacts to civil and commercial aviation traffic in 125 FW training airspace would not be significant due to minimal increases in F-35A operations; the lack of Air Traffic Service Routes traversing the Coastal MOA/Townsend Range Complex, Palatka MOA/Pinecastle Range, and Warning Areas; and the existing procedures in place for scheduling and use of the SUA. Additionally, the traffic on the high altitude routes J-53, J-81, and J-75, which traverse above the Coastal MOA Complex, are within positive control airspace (over 18,000 feet MSL) that is released by the FAA for military training only when not needed for other air traffic purposes.

Close coordination and scheduling use of the MOAs, Restricted Areas, and Warning Areas by the 125 FW with the scheduling agencies and Jacksonville ARTCC would continue to ensure safe air traffic operations throughout the region. Other air traffic traveling near these airspace units would not be in conflict with military flight activities. In addition, the F-35A would conduct a greater

percentage of training at higher altitudes than the F-15Cs. Therefore, since the Proposed Action Alternative represents a continuation of current activities with slight increases in operations, and because no comments were received during the public scoping period revealing conflicts with civil or commercial aviation, no significant impacts to airspace use and management would be expected.

No Action Alternative

Under the No Action Alternative, the F-15s would continue to fly from Jacksonville IAP and use the same training airspace as they do today. No changes to the number of operations or frequency of use of the training airspace would occur. Operations would remain as described in Section FL3.2.1.1. There would be no change in use of training airspace and therefore, no significant impacts would occur.

FL3.2.3 Summary of Impacts

The one-for-one replacement of F-15 military aircraft with F-35A aircraft assigned to the 125 FW would not require changes in local airspace or airfield management. Eventual replacement of F-15 aircraft at the installation with F-35As would result in an approximate 28 percent increase in 125 FW military airfield operations and a 1 percent increase in total airfield operations when compared to the current operations. This increase in airfield operations would have no significant impact on the local air traffic environment. Time spent in the SUA would be expected to increase approximately 28 percent. The minimal increase in operations would not change the capabilities of Jacksonville IAP Radar Approach Control or its control tower for handling air traffic within the local airspace. No changes to the Jacksonville IAP terminal airspace arrival or departure procedures would be required to accommodate the F-35A. Close coordination of scheduling and use of the SUA by the 125 FW with the scheduling agencies would continue to ensure safe air traffic operations throughout the region. Therefore, impacts to airspace around Jacksonville IAP and the SUA associated with the 125 FW would not be significant as a result of the F-35A beddown.

FL3.3 AIR QUALITY

FL3.3.1 Installation

The following section describes the affected environment and examines the extent to which the beddown of the F-35A at the 125 FW installation would be consistent with federal, state, and local air quality regulations.

FL3.3.1.1 Affected Environment

The affected environment for the air quality analysis is Duval County, Florida, which is part of the Jacksonville (Florida)-Brunswick (Georgia) Interstate Air Quality Control Region (AQCR) (40 CFR 81.91). Duval County is in attainment for all criteria pollutants. There is a small area of nonattainment for SO₂ associated with a paper mill located in adjacent Nassau County, but it lies well beyond the distance the ANG aircraft from the 125 FW installation would travel below the mixing height, and therefore would not be impacted by aircraft emissions.

Table FL3.3-1 presents the 2014 emission inventory for Duval County, which includes the city of Jacksonville, as well as Jacksonville IAP.

Table EI 2 2 1	2014 Cuitania Dallutant	Emissions for Dr	and Country	Florida (tona/mon)
Table FL3.3-1.	2014 Criteria Pollutant	Emissions for Du	ival County, 1	riorida (tons/year)

Location	VOCs	NO _x	СО	SO_2	PM ₁₀	PM _{2.5}	
Duval County, FL	45,923	37,923	157,658	24,640	16,454	6,934	
<i>Legend</i> : $CO = carbon monoxide; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; PM_{2.5} = particulate matter less than$							
or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in							
diameter; VOC = volatile organic compound.							

Source: USEPA 2018a.

In the Duval County, Florida region, the summers are long, hot, and mostly cloudy; the winters are short, cool, and partly cloudy; and it is wet and humid year round. Over the course of the year, the temperature typically varies from 46 degrees Fahrenheit (°F) to 90°F and is rarely below 32°F or above 95°F. Rain falls throughout the year in Duval County. The most rain falls during the 31 days centered around September 6, with an average total accumulation of 5.2 inches during this period (Weather Spark 2018).

Since 1958, the amount of precipitation during heavy rainstorms has increased by 27 percent in the southeast, and the trend toward increasingly heavy rainstorms is likely to continue. Seventy years from now, temperatures in most of the state are likely to rise above 95°F between 45 and 90 days per year, compared with less than 15 days per year today (USEPA 2016).

Airfield operations are performed by the 125 FW, which currently flies 18 F-15 C/D aircraft that are scheduled to be replaced by the F-35A. For the air quality analysis, only the aircraft to be replaced have been analyzed, as all other aircraft and their activities would remain the same. The annual operations for the aircraft include 2,400 landings and take-offs and 50 closed patterns. Other sources of air emissions associated with aircraft operations include airfield equipment such as tow tractors, and aircraft engine testing. Table FL3.3-2 presents the annual F-15 C/D emissions for the 125 FW at Jacksonville IAP. Emission estimates were developed for the 18 F-15C and F-15D aircraft, using the F100-PW-220 engines. Emission estimates were derived manually using installation-specific data and include landings and take-offs, closed patterns, and annual engine testing. F-15 aircraft emissions are based on operations data provided by the installation, and

represent the most recent data available on flight operations. Aerospace Ground Equipment (AGE) operations emissions estimates were derived from the USAF's Air Conformity Applicability Model (ACAM), where a number of default values were used.

Table FL3.3-2. Annual F-15 Emissions Estimates for the 125 FW Jacksonville IAP (tons/year)

			(tons, j cu	.,				
Emission Source	VOCs	NOx	СО	SO 2	PM 10	PM _{2.5}	CO ₂ e	
F-15C/D	50.61	66.00	215.66	9.04	6.34	5.79	25,222	
1 1 00 1	11 00	> 1	1 1 .	1 ()10	•.	1 00	10	

Legend: $CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; PM_{2.5} = particulate matter less than or equal to 2.5 microns in diameter; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.$

FL3.3.1.2 Environmental Consequences

Proposed Action

Air quality impacts within the affected environment were reviewed relative to federal, state, and local air pollution standards and regulations. Refer to Section 3.4 for a detailed discussion of air quality resource definitions and the analytical methodology for evaluating impacts.

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the USEPA's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 tons per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant, the indication is the air quality impacts will be insignificant for that pollutant. In the case of criteria pollutants for which the proposed project region does not attain a NAAQS, the analysis compares the net increase in annual direct and indirect emissions to the applicable pollutant de minimis threshold(s). If the net direct and indirect emissions from the project alternative equal or exceed an applicable *de minimis* threshold, then a positive general conformity determination is required before any emissions from the actions may occur.

Construction

As a result of the proposed construction, there would be up to 468,492 SF (10.8 acres) of new construction footprint, including 81,600 SF (1.9 acres) new impervious surface. All proposed construction would be within the footprint of the developed installation. The calculations have been performed to account for all construction in 12 months, even though some projects would last longer than 12 months. This is to ensure a worst-case emissions scenario is captured. The following assumptions were used for construction projects at the 125 FW installation:

- New building foundations require excavation of at least 1 foot of grade soil.
- All buildings are single story.
- All new buildings require at least 100 feet of utility trenching.
- All new impervious surfaces are assumed to be concrete, unless specified otherwise.
- All construction activities were assumed to occur in one year to provide a worst-case scenario for emissions. This means all construction was calculated to occur in 2020.
- Where two options are under consideration, the option that would generate the greatest emissions was selected for analysis.

Construction emission estimates were prepared using the USAF air model ACAM. Emissions would primarily be generated by:

- diesel-powered construction equipment operating on-site,
- trucks removing or delivering materials from the construction areas,
- construction worker vehicles,
- application of architectural coatings, and
- dust created by grading and other bare earth construction activities.

Results of the modeling are presented in Table FL3.3-3. The 250-ton per year value serves as a comparative indicator for all criteria pollutants and precursors. Detailed information on the modeling can be found in Appendix C.

1201 (tons, year)												
Year	VOC	NO _x	СО	SO_x	PM 10	PM _{2.5}	CO ₂ e					
2019	1.60	4.84	4.48	0.01	15.66	0.23	1,003					
Comparative Indicator	250	250	250	250	250	250	NA					
Exceedance (Yes/No)	No	No	No	No	No	No	NA					

Table FL3.3-3. Annual Construction Emissions Estimates for the	ļ
125 FW installation at Jacksonville IAP - 2019 (tons/year)	

Legend: $CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM_{2.5} = particulate matter less than or equal to 2.5 microns in diameter; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.$

Based on the ACAM calculations, the emissions associated with the construction necessary to prepare the airfield for the basing of the F-35A would not be significant. All of the criteria pollutant emissions are below the comparative indicator values. A Record of Air Analysis (ROAA) has been prepared to document that the impacts would not be significant, and can be found in Appendix C.

Airfield Operations

Airfield operations for the 18 F-35A would be similar to those currently occurring with the F-15. The primary differences would be that the annual number of landings and take-offs is projected to increase by 661 and the closed patterns are expected to increase by 50, resulting in an overall increase in operations. There would be no changes of note to munitions use below 3,000 feet AGL. The net change in operational emissions at the 125 FW installation are presented in Table FL3.3-4 for 2025, when all 18 F-35A aircraft would be on-site and operational. This would represent the new airfield emission profile moving forward. The emissions account for the difference in the engine operations between the F-15 and F-35A aircraft, the increase in annual operations, and an increase in 85 commuting personnel who would be assigned to the 125 FW installation as a result of basing the F-35A at the installation.

Emissions Source	VOC	NO_x	СО	SO_x	PM ₁₀	PM _{2.5}	CO_2e					
F-35A Operations	6.02	71.60	21.19	14.26	2.34	2.24	20,916					
F-15C Operations	50.61	66.00	215.66	9.04	6.34	5.79	25,222					
Net Change	-44.60	5.60	-194.48	5.22	-4.00	-3.55	-4,306					
Comparative Indicator	250	250	250	250	250	250	NA					
Exceedance (Yes/No)	No	No	No	No	No	No	NA					

Table FL3.3-4. Annual Airfield Emissions Estimates for 125 FW – 2025 (tons/year)

Legend: $CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM_{2.5} = particulate matter less than or equal to 2.5 microns in diameter; PM₁₀ = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.$

The net change is the difference in emissions resulting from instituting the Proposed Action to base the F-35A as compared to not introducing the action.

Based on the calculations, the F-35A operational emissions associated with the 125 FW installation would not exceed the comparative indicator, as only two criteria pollutant emissions would increase slightly, nitrogen oxides (NO_x) and sulfur oxides (SO_x), and all other criteria pollutants would decrease as a result of the conversion. The emissions associated with the basing of the F-35A at the 125 FW installation would not be significant. A ROAA has been prepared to document that the airfield operation impacts would be minimal, and can be found in Appendix C.

Greenhouse Gas Emissions

The proposed construction activities would contribute directly to greenhouse gas (GHG) emissions from fossil fuels. Demolition and construction activities would generate 1,003 tons of carbon dioxide equivalents (CO_2e) emissions for 2020. To put these emissions in perspective, 1,003 tons of GHGs is the equivalent of 196 cars driving the national average of 11,500 miles per year (USEPA 2018b). These GHG emissions would only be generated during the construction period. The operation of new facilities may result in a small increase in installation-related GHG emissions, primarily through the consumption of electricity and possibly through the combustion of fossil fuel on-site if any oil or natural gas boilers or other heating units are installed in the new facilities.

GHG emissions from airfield operations are based on the same mobile sources as the criteria pollutants: aircraft flight operations at the airfield, AGE, and jet engine testing. For the proposed F-35A basing, additional commuter emissions are included because of an increase in personnel resulting from the basing of the F-35A. The annual airfield CO_2e emissions would decrease by 4,306 tons, or approximately 17 percent as a result of the transition. This is equivalent to removing approximately 841 passenger vehicles from the road, driving 11,500 miles per year on average.

While the GHG emissions generated from the construction alone would not be enough to cause global warming, in combination with past and future emissions from all other sources they would contribute incrementally to the global warming that produces the adverse effects of climate change.

No Action Alternative

Under the No Action Alternative, the transition of F-15C aircraft to F-35A aircraft would not occur. There would be no construction nor alterations to the 125 FW installation in support of the F-35A beddown. Air emissions would not be notably different from those that occur today and as such, would not be significant.

FL3.3.2 Airspace

FL3.3.2.1 Affected Environment

The affected environment is the airspace units that are used by the 125 FW that consist of Warning Areas off the Atlantic Coast to accomplish approximately 90 percent of their training. The other 10 percent of training occurs over land in MOAs, Restricted Areas, and ATCAAs with some operations in the Coastal MOA/Townsend Range complex (see Table FL2.2-1 and Figure FL2.2-1). The F-15Cs currently fly approximately 1.5 percent of the time below 3,000 feet AGL, which is below the mixing height and where emissions from the flying aircraft can influence

ground-level air quality. None of the areas are designated by USEPA as nonattainment or maintenance areas for criteria pollutants.

FL3.3.2.2 Environmental Consequences

Proposed Action

Generally, the F-35A would fly at higher altitudes, operating at 3,000 feet AGL or higher about 99 percent of the flight time. This would be a 0.5 percent decrease in flight below the mixing height compared to the legacy F-15C aircraft. No new airspace or airspace reconfigurations are proposed, or would be required to support the F-35A beddown at the 125 FW installation. The overall impact on air quality as a result of F-35A flight in the airspace would remain relatively unchanged. As a result, there would be no significant impacts to air quality in the airspace as a result of the Proposed Action.

GHG emissions that occur both below and above the mixing height contribute to climate change. Aircraft training activities in the airspaces are highly variable, and it is not possible to quantitatively analyze the affected environment or Proposed Action GHG emissions in airspace. While there would be a modest increase in annual operations, GHG emissions would be anticipated to decrease based on the different emission rates between the F-15 and the F-35, similar to the decrease associated with transitioning airfield activities between the two aircraft.

No Action Alternative

Under the No Action Alternative, the transition of F-15C aircraft to F-35A aircraft would not occur and the F-15C would continue to operate from the 125 FW installation. Airspace activities would not be notably different from those that occur today, and as such would not be significant.

FL3.3.3 Summary of Impacts

Duval County is in attainment for all criteria pollutants and has no designated maintenance areas. Based on the ACAM calculations, the emissions associated with construction of the 125 FW installation for the basing of the F-35A would not be significant. Under this alternative, all criteria pollutants would decrease. All of the criteria pollutant emissions would remain well below the comparative indicator value. There would be an anticipated decrease of 0.5 percent for operations below the mixing height in the SUA, which would be a minor positive impact. Impacts to air quality associated with the proposed beddown of the F-35A at the 125 FW installation would not be significant.

FL3.4 SAFETY

FL3.4.1 Installation

FL3.4.1.1 Affected Environment

Fire/Crash Response

Day-to-day operations and maintenance activities conducted by the 125 FW are performed in accordance with applicable USAF safety regulations, published USAF Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. The 125 FW provides fire, crash, rescue, and structural fire protection for the installation and its aircraft. The 125 FW has a cooperative response agreement with the local Jacksonville IAP fire department for mutual aid in fire protection, first responder and lifesaving services, and hazardous materials incident response. The 125 FW adheres to specific emergency-response procedures contained in the Technical Order 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information*, for aircraft mishaps involving composite materials (USAF 2018). Specifically, Technical Order 00-105E-9 contains a section (Chapter 3) on Mishap Composite Awareness that provides guidance on fire response to aircraft containing composite materials.

Accident Potential Zone/Runway Protection Zone

Runway Protection Zones (RPZs) are trapezoidal zones extending outward from the ends of active runways at commercial airports and delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during take-off or landing (Figure FL3.4-1). Development restrictions associated with RPZs are intended to preclude incompatible land use activities from being established in these areas (see Chapter 3, Section 3.5.1.1 for specific RPZ discussion and Section 3.6.1 for land use compatibilities). The City of Jacksonville utilizes the FAA's airport land use compatibility guidelines, and as such, the RPZs have allowed development to be compatible with airport operations.

Facilities within the 125 FW installation are sited in Department of Defense (DoD) Clear Zones (CZs), contrary to UFC 3-260-01 guidelines, but comply with the less stringent FAA Approach Obstacle Free Zone. As such, the 125 FW operates with an airfield waiver.



Explosive Safety

The 125 FW stores, maintains, and uses a small range of munitions required for performance of their mission. The Munitions Storage Area (MSA) at the 125 FW installation currently has three facilities: B1035, Maintenance and Inspection, B1036 munitions storage, and B1040, inert storage. The two explosive facilities (B1035 and B1036) have large Net Explosive Weight limits supported by large (1,250 foot) CZ around the MSA. Figure FL3.4-2 shows the quantity-distance (QD) arcs associated with these facilities.

Anti-terrorism/Force Protection

Many of the military facilities at the 125 FW installation were constructed before Anti-terrorism/Force Protection (AT/FP) considerations became a critical concern. Thus, many facilities currently do not comply with all current AT/FP standards. However, as new construction occurs and as facilities are modified, the 125 FW would incorporate these standards to the maximum extent practicable.

FL3.4.1.2 Environmental Consequences

Proposed Action

Existing facilities at the 125 FW installation for fire response and crash recovery meet F-35A beddown requirements (ANG n.d.).

Providing new and renovated facilities for the 125 FW that support operational requirements of the F-35A, and are properly sited with adequate space and a modernized supporting infrastructure would generally enhance ground and flight safety during required operations, training, maintenance and support procedures, security functions, and other activities conducted by the 125 FW.

Proposed renovation and infrastructure improvement projects related to this alternative would not impact aircraft take-off and landings or penetrate any RPZs. New building construction is not proposed within RPZs; therefore, construction activity would not result in any greater safety risk or obstructions to navigation. Operations would fall within the same general types as those that have historically occurred at the 125 FW installation. For example, the F-35A would follow established local approach and departure patterns used. Therefore, flight activity and subsequent operations would not require changes to RPZs.



While there are a few planned construction projects within the proposed QD arcs, per Air Force Manual 91-201, *Explosive Safety Standards*, all public traffic route distances (PTRDs) and inhabited building distances (IBDs) meet specified net explosive weight quantity-distance (NEWQD) criteria (Figures FL3.4-3a and FL3.4-3b). No explosives would be handled during construction or demolition activities. Therefore, no additional risk would be expected as a result of implementation of this alternative.

The proposed construction projects meet all criteria specified in the ANG Handbook 32-1084, *Facility Space Standards*. AT/FP requirements have also been addressed to the extent practicable in all projects. Projects would use AT/FP site design standards for siting of facilities, parking, walkways, and other features. Renovations would bring the facilities into compliance with UFC 4-022-01, *Security Engineering: Entry Control Facilities/Access Control Points* and UFC 4-010-01, *DoD Minimum Anti-terrorism Standards for Buildings*, providing additional protection for the personnel based there.

Chapter 3, Section 3.5.1.1 details F-35A composite material characteristics and potential exposure risks. Under the Proposed Action, firefighters would continue to be fully trained and appropriately equipped for crash and rescue response involving advanced aerospace composite materials and the proposed 125 FW F-35A beddown would not change these abilities. Additionally, 125 FW would keep local firefighting departments informed about any new information or firefighting techniques associated with composite materials should an accident occur. Based on current information on the characteristics of burning composite materials, standard firefighting equipment, including self-contained breathing apparatus, should be adequate to protect firefighters (Air Force Research Laboratory 2015; Naval Air Warfare Center 2003). No special extinguishing agents are needed for composite materials and typical aircraft firefighting agents, such as water or aqueous film forming foam, are adequate to control burning composite materials during an aircraft mishap. In the event of a crash of an aircraft containing composite materials, the USAF would follow the guidance contained in the *Mishap Response Checklist for Advanced Aerospace Materials/Composites* (USAF Advanced Composites Program Office 1993).

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. All aspects of ground and flight safety would be expected to remain as described under affected environment in Section FL3.4.1.1. Therefore, there would be no significant impacts to safety under the No Action Alternative.



Figure FL3.4-3a. Proposed QD Arcs and Proposed Construction at the 125 FW Installation



FL3.4.2 Airspace

FL3.4.2.1 Affected Environment

The airspace directly associated with the Proposed Action as it relates to the 125 FW includes Restricted Areas (R-3007A-D), offshore Warning Areas, and Coastal MOAs (see Figure FL2.2-1). The volume of airspace encompassed by the combination of airspace elements constitutes the affected environment for airspace management. These training areas allow military flight operations to occur and minimize exposure to civil aviation users, military aircrews, or the general public to hazards associated with military training and operations. This section describes the existing operations within the training airspace units and the following section evaluates changes that would occur with the introduction of the F-35A.

Flight Safety Procedures

Aircraft flight operations from Jacksonville IAP are governed by standard flight rules. Specific safety requirements are contained in standard operating procedures that must be followed by all aircrews operating from the airfield (Air Force Instruction [AFI] 11-2F-15V3, *F-15 Operations Procedures*, 2014) to ensure flight safety.

Aircraft Mishaps

F-15 aircraft have flown more than 6,798,701 hours since the aircraft entered the USAF inventory in 1972. Over that period, 157 Class A mishaps have occurred and 126 aircraft have been destroyed. This results in a Class A mishap rate of 2.31 per 100,000 flight hours, and an aircraft destroyed rate of 1.85 per 100,000 flight hours (Air Force Safety Center [AFSEC] 2019a). The 125 FW records since 1996 indicate the Wing has not experienced a Class A mishap during the past 21years (125 FW 2017a).

Bird/Wildlife Aircraft Strike Hazard

The USAF Bird/Wildlife Aircraft Strike Hazard (BASH) Team maintains a database that documents all reported bird/wildlife aircraft strikes. Historic information for the past 43 years indicates that for the entire USAF, 16 USAF aircraft have been destroyed and 29 fatalities have occurred from bird/wildlife aircraft strikes (AFSEC 2017a).

The 125 FW of the FLANG has an ongoing BASH program through which information and assistance is freely shared between airfield users, the 125 FW, and the local air traffic controllers. The USAF BASH Team has 44 bird/wildlife strikes recorded from the 125 FW in its database for the period between 1998 and 2016 (125 FW 2016a).

Fuel Jettison

For use in emergency situations, F-15 aircraft (all models) have the capability to jettison fuel and reduce aircraft gross weight for safety of flight. When circumstances require, fuel jettisoning is permitted above 5,000 feet AGL, over unpopulated areas, and is generally over water for coastal bases. AFI 11-2F-F15V3 covers the fuel dumping procedures, and local operating policies cover specific fuel dumping areas for each base.

FL3.4.2.2 Environmental Consequences

Proposed Action

The F-35A is a new aircraft and historical trends show that mishaps of all types decrease the longer an aircraft is operational as flight crews and maintenance personnel learn more about the aircraft's capabilities and limitations. As the F-35A becomes more operationally mature, the aircraft mishap rate is expected to become comparable with a similarly sized aircraft with a similar mission. F-35A has improved electronics and maintenance; thus, they are expected to result in long-term Class A accident rate comparable to that of the similarly sized F-16 aircraft (3.35 lifetime) (AFSEC 2019b).

Through Fiscal Year (FY) 2019,, the F-35A has amassed 96,313 flying hours with three Class A mishaps resulting in no injuries and a Class A mishap rate of 3.11 lifetime, and for the last 5 years of 2.17 (AFSEC 2019c). These statistics are updated annually. Because the F-35A has not yet reached 100,000 hours by the end of FY 2019, this rate is not directly comparable to other aircraft with more flying hours. However, this rate does provide some indication of the overall safety of the F-35A aircraft. For example, this rate is much lower than the 18.65 rate that the F-16 had in the past after a comparable amount of hours.

In order to provide a broader perspective on the potential mishap rate for a new technology like the F-35A, the following discussion refers to the mishap rates for the introduction of the F-22A (Raptor), the latest jet fighter in the DoD inventory. The F-22A was introduced in 2002, and provided the USAF with the most current engine and stealth capabilities. This new technology is akin to the F-35A in that it is a new airframe with similar flight capabilities. With that in mind, it is possible that projected mishap rates for the F-35A may be comparable to the historical rates of the F-22A. The Class A mishap rates for the F-22A from squadron operational status to September 2019 are provided in Table FL3.4-1.

					<u> </u>	smap III	story	
Year	Class A Number of MishapsClass A Class A Rate1Destroyed A/CDestroyed Rate1		Fatal Pilot	Fatal All	Hours Flown per Year	Cumulative Flight Hours		
FY02	1	0.00	0	0.00	0	0	0	0
FY03	0	0.00	0	0.00	0	0	133	133
FY04	1	32.12	0	0.00	0	0	3,113	3,246
FY05	1	24.90	1	24.90	0	0	4,016	7,262
FY06	1	11.10	0	0.00	0	0	9,012	16,274
FY07	0	0.00	0	0.00	0.00 0		14,487	30,761
FY08	1	5.56	0	0.00	0 0 0		17,977	48,738
FY09	1	4.76	1	4.76	0	1	20,988	69,726
FY10	0	0.00	0	0.00	0	0	24,675	94,401
FY11	1	6.54	1	6.54	1	1	15,289	109,690
FY12	3	11.32	0	0.00	0	0	26,506	136,196
FY13	1	3.82	1	3.82	0 0 26,1		26,184	162,380
FY14	1	3.34	0	0.00	0	0	29,939	192,319
FY15	1	3.13	0	0.00	0	0	31,993	224,312
FY16	1	3.24	0	0.00	0	0	30,889	255,201
FY17	1	2.96	0	0.00	0	0	33,834	289,035
FY18	5	13.01	0	0.00	0	0	38,424	327,458
FY19	6	21.48	0	0.00	0	0	27,932	355,390
Lifetime	26	7.32	4	1.13	1	2	-	355,390

Table FL3.4-1. F-22A Class A Flight Mishap History

Note: ¹Mishap rate is based on 100,000 hours of flight. *Legend:* A/C = aircraft.

Source: AFSEC 2019d

Since introduction of the single jet engine fighter or attack aircraft in the 1950s, technological advances have continually driven down the engine failure rate and associated aircraft mishaps (Figure FL3.4-4) (AFSEC 2017b).

Although the F-35A is a new aircraft, the single engine that powers it is a composite product of 30 years of engineering, lessons learned from previous single aircraft engines with a similar core, and tens of thousands of hours during operational use of legacy aircraft. The propulsion system design for the F-35A includes a dedicated system safety program with an acceptable risk level that was more stringent than legacy engines. The engine safety program focused on the major contributors of what previously caused the loss of an aircraft and provided redundancies in case of control system failures; additionally, the program allowed for safe recovery of the aircraft even with system failures. Throughout the design and testing process, safety initiatives took previous best practices for single engine safety and built upon them to promote flight safety progress. Examples of design characteristics that are damage tolerant and enhance safety include a dual wall engine liner, a fan blade containment shell, and a shaft monitor for vibration, torque, and alignment.



United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



Note: "Engine-related" excludes mishaps caused by foreign object damage, BASH, or failure of support systems external to the engine (e.g., fuel starvation).
 Source: AFSEC 2017b.

Additionally, pilots flying the F-35A would use simulators extensively. Simulator training includes all facets of flight operations and comprehensive emergency procedures. The sophistication and fidelity of current simulators and related computer programs are commensurate with the advancements made in aircraft technology. These factors should minimize risk associated with mishaps due to pilot error.

Due to the addition of the F-35A aircraft under the Proposed Action at the 125 FW installation, there would be an increase of approximately 1 percent in total Jacksonville IAP airfield operations compared to the affected environment. Under these scenarios, the increase in take-offs, landings, proficiency training, and other flights would result in a commensurate increase in the safety risk to aircrews and personnel. However, current airfield safety procedures discussed previously would continue to be implemented and additional airfield flight operations would adhere to established safety procedures.

The F-35A would operate in the same airspace environment as the F-15C aircraft. As such, the overall potential for bird aircraft strikes is not anticipated to be statistically different following the

beddown of the F-35A. However, the F-35 is considered to be more vulnerable to a catastrophic wildlife strike due to the Electro-Optical Targeting System (EOTS) Window Assembly than the legacy aircraft. Damage to the EOTS due to a wildlife strike could damage the engine, which could result in the catastrophic loss of the aircraft. It is anticipated that BASH potential would be somewhat lessened because the F-35A attains altitude more rapidly and would spend less time than F-15C aircraft at lower altitudes where species generally fly. In addition, F-35A aircrews operating in the 125 FW associated training airspace would be required to follow applicable procedures outlined in the 125 FW BASH Plan; adherence to this program has minimized bird aircraft strikes. When risk increases, limits are placed on low-altitude flights and some types of training (e.g., multiple approaches, closed pattern work). Furthermore, special briefings are provided to pilots whenever the potential exists for greater bird strike risks within the airspace; F-35A pilots would also be subject to these procedures.

Chapter 3, Section 3.5.1.1 details F-35A composite material characteristics and potential exposure risks. Under the Proposed Action, firefighters would continue to be fully trained and appropriately equipped for crash and rescue response involving advanced aerospace composite materials and the proposed 125 FW F-35A beddown would not change these abilities. Additionally, 125 FW would keep local firefighting departments informed about any new information or firefighting techniques associated with composite materials should an accident occur. Based on current information on the characteristics of burning composite materials, standard firefighting equipment, including self-contained breathing apparatus, should be adequate to protect firefighters (Air Force Research Laboratory 2015; Naval Air Warfare Center 2003). No special extinguishing agents are needed for composite materials and typical aircraft firefighting agents, such as water or aqueous film forming foam, are adequate to control burning composite materials during an aircraft mishap. In the event of a crash of an aircraft containing composite materials, the USAF would follow the guidance contained in the *Mishap Response Checklist for Advanced Aerospace Materials/Composites* (USAF Advanced Composites Program Office 1993).

The only maintenance of the stealth coating (e.g., low observable material) that would be accomplished at the base would be done using a brush or roller to apply coatings, bonding materials, or applying tape. Depot-level maintenance of the low observable material (including spray capability) would be conducted off-site, and therefore the composite material for major repairs to the low observable material would not be stored on base.

The F-35A does have the capability to jettison fuel for emergency situations. When circumstances require, fuel jettisoning is permitted above 5,000 feet AGL, over unpopulated areas, and is generally over water for applicable bases. AFIs cover the fuel jettison procedures, and local operating policies define specific fuel ejection areas for each base. In 2001, the USEPA National Vehicle and Fuel Emissions Laboratory concluded, "Since fuel dumping is a rare event, and the

fuel would likely be dispersed over a very large area, we believe its impact to the environment would not be serious" (USEPA 2001).

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. All aspects of safety would remain as described in the affected environment in Section FL3.4.2.1. Therefore, there would be no significant impacts to safety as a result of the No Action Alternative.

FL3.4.3 Summary of Impacts

Construction activities would not pose any unusual concerns, and standard construction safety procedures would be implemented. All new construction would implement AT/FP requirements. While there are a few planned construction projects within the proposed QD arcs, per Air Force Manual 91-201, *Explosive Safety Standards*, all PTRDs and IBDs meet specified NEWQD criteria. Though the F-35A is a relatively new fighter aircraft with fewer years in service, the expected mishap rate is not expected to be different than other fighter aircraft. The 125 FW has a robust BASH program, and BASH incidents could be expected to decline with the F-35A as described. The 125 FW would continue to use the same SUA that they currently use. Under the Proposed Action at the 125 FW installation, impacts to safety would not be significant.

FL3.5 LAND USE

FL3.5.1 Installation

The following section describes the affected environment and examines the extent to which the beddown of the F-35A at the 125 FW installation would be consistent with state, regional, and local conservation and development plans and zoning regulations. In order to provide a comparable data set between proposed siting alternatives at the five locations considered for the Proposed Action, local land use categories were consolidated and/or renamed. Table FL3.5-1 provides a cross-reference between the Duval County classifications and those used in this analysis.

	8
Duval County Land Use Classification	EIS Land Use Classification
Acreage Not Zoned for Agriculture, Residential, Vacant Residential	Residential
Institutional, Retail/Office,	Commercial
Industrial, Mining	Industrial
Public/Semi-Public	Public/Semi-Public
Recreation	Parks/Open Space
Mixed Use	Mixed Use
Vacant/Non-Residential, Agricultural, Non-Assessed, Parcels with No Value	Agriculture

Table FL3.5-1. Land Use Categories

Legend: EIS = Environmental Impact Statement.

FL3.5.1.1 Affected Environment

The 125 FW installation occupies a 342-acre parcel of land leased from the Jacksonville Airport Authority on the southwestern edge of Jacksonville IAP located in northern Duval County, about 14 miles from the Jacksonville city center. In 2007, the City of Jacksonville adopted a new Part 10 of its Land Use and Zoning Code to recognize Airport Environs Zones, which include all property within a Height and Hazard Zone, Noise Zone, Notice Zone, School Regulation Zone, Miscellaneous Use Zone, Runway Safety Area, and RPZ. The Height and Hazard zones are based on the limits defined in Federal Aviation Regulations Part 77, *Objects Affecting Navigable Airspace* (Jacksonville IAP 2010). The City of Jacksonville has zoned the areas encompassing the 125 FW installation and Jacksonville IAP as industrial light, and designated them within the Public Buildings and Facilities-3 (PBF-3) district. The PBF-3 district allows for uses that include both airports and military installations. Land west and northwest of the airport are zoned as agriculture, industrial, and public/semi-public. East of the airport is comprised of industrial, public/semipublic, commercial, and a small amount of residential areas (City of Jacksonville 2018).

Land use activities most sensitive to noise typically include residential and commercial use, public services, and areas associated with cultural and recreational uses. Noise measurements related to aircraft operations that define the area of noise impact are expressed in terms of DNL. DNL represents the average annual day noise exposure from aircraft operations during a 24-hour period over a year. The DoD has established noise compatibility criteria for various land uses. According to these criteria, sound levels up to 65 dB DNL are compatible with land uses such as residences, transient lodging, and medical facilities. Currently, aircraft noise from Jacksonville IAP exposes approximately 2,442 acres of off-airport areas of land zoned as industrial light, agricultural, commercial community general, residential rural, and other to noise levels between 65 and 80 dB DNL. Section FL3.1, *Noise,* discusses existing noise levels on POIs such as schools and churches located within the 65 dBA and 70 dBA DNL off-airport noise contour areas. Figure FL3.5-1 shows existing noise contours and the land use in the vicinity of Jacksonville IAP.

United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



FL3.5.1.3 Environmental Consequences

Proposed Action

All new construction would occur on previously disturbed land and would be totally within the boundary of the 125 FW installation. Additionally, there would be no change to the existing airfield-related RPZs and CZs. Therefore, the focus of this analysis is on changes in off-installation noise conditions.

The land use analysis compares the proposed noise contours to current noise contours, which show the existing noise environment. The comparison of the proposed contours to the current contours shows potential change in noise conditions and land use compatibility (Table FL3.5-2 and Figure FL3.5-2). The Proposed Action at the 125 FW installation would result in an overall decrease in the area affected by noise levels between 65 and 80 dB DNL by approximately 688 acres (Table FL3.5-2). No residential land use would fall under areas affected by noise greater than 65 dB DNL.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Land use would be expected to remain as described under affected environment in Section FL3.5.1.1. Therefore, there would be no additional significant impacts to land use under the No Action Alternative.

Table FL5.5-2. On-An port Land Uses Affected b								y noise Levels 05 ub Divil and Greater under Froposed Action										
Land Use Category	65-70 (C)	65-70 (P)	65-70 (AC)	70-75 (C)	70-75 (P)	70-75 (AC)	75-80 (C)	75-80 (P)	75-80 (AC)	80-85 (C)	80-85 (P)	80-85 (AC)	85+ (C)	85+ (P)	85+ (AC)	Totals (C)	Totals (P)	Totals (AC)
Commercial	4	0	-4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	-4
Industrial	599	438	-161	146	52	-94	26	0	-26	0	0	0	0	0	0	771	490	-281
Public/Semi- Public	727	663	-64	272	230	-41	152	13	-139	0	0	0	0	0	0	1,150	906	-244
Parks/Open Space	16	0	-16	0	0	0	0	0	0	0	0	0	0	0	0	16	0	-16
Agriculture	393	297	-96	107	61	-47	0	0	0	0	0	0	0	0	0	501	358	-143
Total	1,739	1,398	-341	525	343	-182	178	13	-165	0	0	0	0	0	0	2,442	1,754	-688

Table FL3.5-2. Off-Airport Land Uses Affected by Noise Levels 65 dB DNL and Greater under Proposed Action

Note: Numbers may not add up due to rounding errors.

Legend: (C) = Current; (P) = Proposed; (AC) = Acres Change; dB = decibel; DNL = Day-Night Average Sound Level.

United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



FL3.5.2 Airspace

FL3.5.2.1 Affected Environment

The 125 FW uses several airspace units (see Table FL2.2-1 and Figure FL2.2-1). The Coastal Townsend complex is airspace over Georgia, west and southwest of Savannah. The land area under the airspace lies within the counties of Brantley, Bryan, Glynn, Liberty, Long, McIntosh, Pierce, Tattnall, Toombs, and Wayne. Several small towns are under the airspace. DoD-managed lands, Fort Stewart Military Reservation and the Townsend Range, also lie under the airspace (Figure FL3.5-3). Special use areas provide recreational opportunities and/or solitude or wilderness experiences. These areas may include public land areas such as national forests or state and local parks. Coastal Townsend overlies the Gordonia-Alatamaha State Park, the Alatamaha Wildlife Management Area (WMA), the Big Hammock WMA, the Griffin Ridge WMA, the Moody Forest WMA, the Penholoway Swamp WMA, the Paulk's Pasture WMA, and the Sansavilla WMA. A WMA is designated as a protected area set aside for the conservation of wildlife and habitats, while allowing some recreation access. Recreational uses in these areas include hunting, camping, boating, canoeing, fishing, geocaching, and wildlife watching (Georgia Department of Natural Resources 2018).

FL3.5.2.2 Environmental Consequences

Proposed Action

The Proposed Action would not require changes in SUA attributes, volume, or proximity and it is expected that the type and number of ordnance employed at the range would remain the same or decrease. Additionally, the Proposed Action would not alter the structure, size, or operation of DoD lands, nor would the acquisition of new non-DoD lands be required. 125 FW operations within the airspace would increase. However, the 125 FW Proposed Action would not generate changes to the status or use of underlying lands, nor would it affect existing plans or policies implemented for land management. Standard flight rules require all pilots to avoid direct overflight of populated areas by 1,000 feet and structures by 500 feet. Furthermore, the FAA and DoD have identified and published avoidance criteria for specific aviation-related or noise-sensitive areas. F-35A aircraft (as do existing military aircraft) would adhere to all established floors and ceilings of airspace units as well as the procedures for their use. The differences in utilization of the existing airspace include use of higher altitudes overall, combined use of existing airspace, and generally higher altitudes for supersonic flights that occur.


While general noise would increase, the F-35A would be expected to fly more of the time at higher altitudes than the F-15 currently used by the 125 FW, operating more than 90 percent of the time above 10,000 feet MSL. All supersonic flight would be conducted above 15,000 feet MSL, with 90 percent occurring above 30,000 feet MSL. All airspace associated with the 125 FW lies within the typical flight distance available during a standard daily training flight for the F-35A. Depending upon the distance, speed, and type of training activity, the F-35A would spend approximately 30-60 minutes in the training airspace. On occasion during an exercise, the F-35A may spend up to 90 minutes in one or more airspace units. Changes in noise levels from the 125 FW Proposed Action would not affect general land use patterns, land ownership, or management of lands or special use land areas, such as the WMAs, beneath the airspace. Impacts to land use under the SUA would not be significant.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Land use would remain as described in the affected environment in Section FL3.5.2.1. Therefore, there would be no significant impacts to land use as a result of the No Action Alternative.

FL3.5.3 Summary of Impacts

Under the Proposed Action at the 125 FW installation, there would be a decrease of 688 acres within the 65 dB DNL and greater noise contours; no residential land use acreage would be included in the 65 or greater dB DNL noise contour. There would be no anticipated changes to the status or use of lands under the SUA as a result of the Proposed Action; therefore, impacts to land use under the SUA would not be significant.

FL3.6 SOCIOECONOMICS

FL3.6.1 Installation

The 125 FW installation is located at Jacksonville IAP in Duval County in the city of Jacksonville. Nassau County is also located less than 6 miles from the airport.

FL3.6.1.1 Affected Environment

Population

Population information for the state of Florida, Nassau County, Duval County, and the city of Jacksonville is presented in Table FL3.6-1. The population of Jacksonville increased by 86,167

between 2000 and 2010 and then increased by an additional 34,832 people between 2010 and 2016. This represents a 16.4 percent increase in the population since 2000. Duval County showed a lower growth rate with a 15.7 percent increase and Nassau County and the state of Florida as a whole showed a higher growth rate and increased by about 33.9 percent and 24.7 percent, respectively.

Area	2000	2010	2016	Percent Change 2000-2016	Percent Change 2010-2016
Florida	15,982,378	18,801,310	19,934,451	24.7%	6.0%
Duval County	778,879	864,263	900,890	15.7%	4.2%
City of Jacksonville	735,617	821,784	856,616	16.4%	4.2%
Nassau County	57,663	73,314	77,187	33.9%	5.3%

Table FL3.6-1. Population, 2000, 2010 and 2016

Source: U.S. Census Bureau 2000, 2010, and 2016a.

Employment and Income

Table FL3.6-2 provides employment and income data for the state of Florida, Nassau County, Duval County, and the city of Jacksonville. Median household income and per capita income in Jacksonville in 2016 were lower than in Duval County, Nassau County, and the state of Florida overall. The unemployment rate as of early 2018 at the state and county level were both low and Duval County's rate of 3.7 percent was higher than that of Nassau County (3.4 percent) and lower than the rate for the state as a whole which was 3.8 percent.

Area	Median Household Income (2016)	Per Capita Income (2016)	Labor Force (2016)	Employed (2016)	Unemployed (2018)	Unemployment Rate (2018)
Florida	\$48,900	\$27,598	10,228,481	9,838,849	389,632	3.8%
Duval County	\$49,196	\$27,235	487,728	469,728	18,000	3.7%
City of Jacksonville	\$48,256	\$26,159	N/A	N/A	N/A	N/A
Nassau County	\$59,196	\$31,141	39,425	38,090	1,335	3.4%

 Table FL3.6-2.
 Employment and Income Statistics

Note: Employment data for the city of Jacksonville is not available from the Bureau of Labor Statistics.

Legend: N/A = not applicable.

Source: U.S. Census Bureau 2016b; Bureau of Labor Statistics 2018a, 2018b.

Housing

As shown in Table FL3.6-3, in 2016 there were an estimated 50,429 vacant housing units in the city of Jacksonville, an estimated 54,244 vacant housing units in Duval County, and 6,938 vacant housing units in Nassau County. The overall vacancy rate for housing was 13.5 percent in Jacksonville, 13.7 percent in Duval County, and 19.2 percent in Nassau County. The housing vacancy rate for Florida was 19.2 percent.

Area	Housing Units	Vacant Housing Units	Housing Vacancy Rate
Florida	9,152,815	1,759,553	19.2%
Duval County	396,150	54,244	13.7%
City of Jacksonville	372,432	50,429	13.5%
Nassau County	36,152	6,938	19.2%

 Table FL3.6-3. Housing Characteristics, 2016

Source: U.S. Census Bureau 2016c.

FL3.6.1.2 Environmental Consequences

Proposed Action

Preliminary estimates of the construction required under this alternative place the cost of construction between \$90 and \$120 million. Additionally, there would be an anticipated increase in the number of operational personnel. As such, both construction and operational activities would impact socioeconomic conditions.

Population and Housing

Based on estimated construction spending and data from the 2012 Survey of Business Owners, which indicate an average of one construction worker for every \$285,520 in construction sales, construction for the Proposed Action would require a total of between 315 and 420 construction workers over the 2020 to 2023 period (U.S. Census Bureau 2012). No permanent population increase would be anticipated as the construction would not be permanent, and the local construction workforce and journeymen could meet the labor demand.

During operation, an Active Duty Associate Unit of up to 50 personnel would be installed at the 125 FW installation. In addition, up to 35 new personnel would be added to provide security and contract oversight for FMS and the ALIS. In total, up to 85 additional personnel would be required. While it is likely that many of the additional personnel would already reside in the area, some population increase may occur. Under a maximum impact scenario, if all of the 85 new personnel relocated from outside the area and brought dependents, assuming an average household size of 2.6, the total population increase would be up to 221 people. This would be an increase of less than 0.1 percent of the population of the city of Jacksonville. Assuming the 85 additional personnel (and their dependents) required one housing unit each, 85 additional housing units would be demanded, which could easily be absorbed by the areas vacant units, requiring only 0.2 percent of the vacant housing units in the city of Jacksonville or Duval County.

For both construction and operations, impacts related to population and housing would not be significant.

Employment and Income

Construction activities associated with the Proposed Action are estimated to sustain between 315 and 420 construction jobs. Based on 2017 construction industry salaries for Duval County (Bureau of Labor Statistics 2018a), those jobs would generate a total of between \$16.9 and \$22.6 million in income over the 2020 to 2023 period.

An additional 85 permanent personnel would be added for the operational phase of the Proposed Action. Based on 2017 transportation industry salaries (Bureau of Labor Statistics 2018a), those jobs would generate approximately \$4.5 million in income per year, for the life of the project.

The increases in employment and income would be beneficial but negligible.

Property Values and Property Taxes

Property values are a function of many different variables, including noise levels. The issue of the negative effect of airport noise on property values has been widely researched. A more full discussion of the impacts of noise levels on property values and resultant real estate taxes is contained in Appendix B, Noise Modeling, Methodology, and Effects. The property value to noise effects relationship is presented in the form of the Noise Depreciation Index (NDI), which reflects the estimated percent loss of property value per dB DNL (see Section 3.2.2). A review of several relevant studies (see Appendix B) concludes that noise may affect property values and related taxes in a NDI range of 0.2 to 2.0 percent per dB of noise increase, which correlates to an average loss of 0.5 percent of the property value per dB. The value of the property is determined based on many individual variables which, when taken together, form the total price and requires detailed information on local housing markets and actual sales prices. Furthermore, price property value studies model relationships between city level income and population data, and the overall willingness to pay for noise abatement, which enables an estimate of noise impacts in locations where detailed housing data is not available. The cost of noise mitigation is less of a factor in regions that experience extreme temperatures. Many structural elements designed to improve energy conservation also improve the acoustic performance of homes. The way properties are used in hot or cold environs (such as not opening windows for ventilation) can add as much as 15 dB of noise mitigation. The anticipation of noise level increase may also influence property values before the noise increases actually occur.

The range of impacts provided in Appendix B of 0.2 to 2.0 percent per dB serve as a rough estimate of potential impacts. These impacts will vary from location to location depending on the many other factors that influence property value including local market conditions.

If an area does in fact suffer from lower property values associated with increased noise levels, this will result in lower property taxes collected. Over time, lower sales prices in these areas will result in lower appraised values.

Table FL3.6-4 shows estimates of total property values and taxes in the census block groups within the 65 dB DNL contour line. Conservative estimates are shown giving a range of potential property value loss due to increased noise levels and the resulting range of potential property tax losses. These estimates assume that houses in the block groups within the 65 dB DNL contour line are exposed to 1 dB DNL increase in noise. As shown in Table FL3.1-10, POIs surrounding Jacksonville IAP would experience marginal noise increases ranging from -1 to 1 dB DNL.

Area*	Housing Units	Estimated Total Value**	Potential Property Value Loss with an average of 1 dB DNL of Noise Increase Low (0.2%)	Potential Property Value Loss with an average of 1 dB DNL of Noise Increase High (2.0%)	Potential Annual Property Tax Loss (0.85% Property Tax Rate) Low	Potential Annual Property Tax Loss (0.85% Property Tax Rate) High
Census Tract 103.01						
Block Group 1	1,200	\$254,572,325	\$509,145	\$5,091,446	\$4,328	\$43,277
Block Group 2	676	\$85,728,729	\$171,457	\$1,714,575	\$1,457	\$14,574
Duval County Total	399,736	\$81,447,127,831	\$680,602	\$6,806,021	\$5,785	\$57,851

 Table FL3.6-4.
 Property Values and Property Tax Loss, 2017

Note: *See Figure FL3.7-2 for block group locations.

**Total value of housing units was estimated using Census data for aggregate housing value and median house value from the American Community Survey.

Source: U.S. Census Bureau 2017, Tax-rates.org 2019.

Overall, the potential lost property value would represent between less than 0.01 and 0.01 percent of the tax base of Duval County.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Socioeconomics would be expected to remain as described under affected environment in Section FL3.6.1.1. Therefore, there would be no significant impacts to socioeconomics under the No Action Alternative.

FL3.6.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for socioeconomics was considered to consist only of the installations themselves. The socioeconomic aspect of potential impacts to lands underlying SUA was not evaluated because no construction or other ground disturbance would occur to generate economic activity.

FL3.6.3 Summary of Impacts

Under the Proposed Action at the 125 FW installation, the population of Duval County would increase by less than 0.1 percent from the additional personnel associated with the day-to-day operations at the installation. There would be slight permanent increases in employment (up to an estimated 85 jobs) and income (\$4.5 million per year). There is sufficient housing in the county for the slight increase in permanent personnel at the installation. While property values are a function of many local variables, studies have shown that noise increases have the potential to impact property values near airports from a low of approximately 0.2 percent to a high of approximately 2.0 percent. Noise increases, as the sole variable, have the potential to negatively impact individual homeowners' property values near Jacksonville IAP from between a 0.2 to a 2.0 percent decrease, while other variables could drive a different result overall. Any potential parallel decline in property tax revenues would result in a minor impact. Impacts to socioeconomics associated with the F-35A beddown at the 125 FW installation would not be significant.

FL3.7 Environmental Justice and the Protection of Children

FL3.7.1 Installation

FL3.7.1.1 Affected Environment

Minority and Low-Income Populations

Figure FL3.7-1 highlights the census block groups in Duval and Nassau counties that are considered environmental justice low-income or minority areas. Out of a total of 530 census block groups in the counties, 194 are classified as having minority populations, 191 are classified as having low-income populations, and 133 of those are classified as both minority and low-income (U.S. Census Bureau 2016d, 2016e). As a whole, minority populations make up 43.7 percent of the two counties' population and 16.3 percent of the population have incomes below the poverty level.

Protection of Children

The city of Jacksonville has an estimated 198,372 children under the age of 18, which is approximately 23.2 percent of the population (U.S. Census Bureau 2016a). This rate is higher than the rate for Duval County (22.9 percent), Nassau County (20.5 percent), and the state of Florida (20.4 percent), which have 206,017, 15,809, and 4,066,276 children under the age of 18, respectively. According to the National Center for Education Statistics (2016), there are a total of 202 schools in Duval County with a total of 127,238 students and Nassau County has a total of 17 schools with 11,260 students.

Elderly Populations

An estimated 110,559 people in Jacksonville, or 12.7 percent of the population, are 65 years of age or older and considered elderly (U.S. Census Bureau 2017). In Duval County, 13.0 percent of the population is elderly (118,638 people) and in the state of Florida it is 19.4 percent (3,926,889 people).

FL3.7.1.2 Environmental Consequences

Proposed Action

Minority and Low-Income Populations

The primary concern for impacts on minority and low-income populations is the potential for increased noise exposure. Figure FL3.7-2 shows the census block groups around the 125 FW installation that are exposed to current and proposed noise levels of 65 dB DNL or higher.

Table FL3.7-1 lists the two census block groups exposed to current and proposed noise levels of 65 dB DNL or higher and indicates the block groups that would be newly exposed to these noise levels under the Proposed Action. As shown in the table, neither of the block groups are newly exposed and neither of the block groups are considered low-income or minority areas and therefore no adverse or disproportionate impacts to environmental justice populations are anticipated.





United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020

Area	Minority Population	Poverty Rate	Population under the age of 18	Elderly Population (Aged	Newly Exposed to Proposed Contours		
Florida	44 4%	14 7%	20.4%	19.4%	N/A		
Duval County	45.3%	14.5%	22.9%	13.0%	N/A		
City of Jacksonville	46.8%	17.0%	23.2%	12.7%	N/A		
Census Block Groups							
Census Tract 103.01							
Block Group 1	30.3%	6.8%	20.8%	12.9%	No		
Block Group 2	44.0%	14.0%	11.6%	16.9%	No		

Table FL3.7-1. Census Block Groups Exposed to Noise Levels of 65 dB DNL or Higher Under Current and Proposed Action Conditions

Note: *See Figure FL3.7-2 for block group locations. *Source:* U.S. Census Bureau 2016a, 2016b, 2017.

Protection of Children

As described in Section FL3.1.1.2, under the Proposed Action Alternative, the number of speech interfering events per school day would increase by one per hour at The Learning Experience and not change at the other six POIs. The time that interior sound levels would exceed 50 dB would increase by 1 minute per day at The Learning Experience and not change at the remaining six POIs. No POIs would be exposed to L_{eq} values over 60 dB for the Proposed Action Alternative. L_{eq} would decrease by 1 dB at two schools, not change at two, and increase by 1 dB at the remaining three POIs. The USAF does not anticipate it would be necessary to close any schools as a result of a basing decision. Interference with classroom speech is discussed in detail in Chapter 4, Section FL3.1.1.2. It is important to note also that most permanent structures, including school buildings, can be effectively insulated from any distracting, exterior noise. Such mitigation is available from the FAA's noise mitigation programs and other sources.

Table FL3.7-1 shows the percent of the populations of the block groups that are under 18. None of the block groups that would be exposed to noise levels of 65 dB DNL or greater have higher proportions of children than Dane County. There are also no schools or childcare centers exposed to current and proposed noise levels between 65 and 70 dB DNL. The areas that would be most directly impacted by the Proposed Action do not contain a disproportionate number of children and no schools or childcare centers are exposed to noise levels between 65 and 70 dB DNL. Therefore, the Proposed Action would not cause a disproportionate impact on children. Further information on impacts associated with noise can be found in Section FL3.1.

Elderly Populations

Older adults have been identified as sensitive receptors to potential adverse impacts due to physiological and behavioral changes that come with age (Air Force Civil Engineer Center [AFCEC] 2014). Table FL3.7-1 shows the percent of the populations of the block groups that are

elderly. Both of the two block groups that would be exposed to noise levels of 65 dB DNL or higher have a higher percentage of elderly people than the city of Jacksonville and one of the two block groups also has a higher proportion of elderly people than Duval County as a whole.

A review of nursing homes and assisted care facilities found that there would be no such facilities within the 65 dB DNL contour (Homeland Infrastructure Foundation-Level Data 2019). Under the Proposed Action, the areas exposed to 65 dB or higher DNL noise levels would be reduced; therefore, there would be no adverse or disproportionate impacts on the elderly.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Environmental justice and the protection of children would be expected to remain as described under affected environment in Section FL3.7.1.1. Therefore, there would be no significant disproportionate impacts to low-income populations, minorities, or children under the No Action Alternative.

FL3.7.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for environmental justice was considered to consist only of the installations themselves. Environmental justice and potential effects to children in communities under the SUA were not evaluated because the only anticipated impacts would be due to aircraft noise, but any changes in noise levels in these areas are anticipated to be minor and would not impact human populations.

FL3.7.3 Summary of Impacts

Census block groups associated with the expected changes in off-airport noise contours associated with the proposed F-35A beddown at the 125 FW installation are not considered to be disproportionately low-income or minority areas. Further, none of these census block groups indicate that there is a higher population of children within them and there would be no newly impacted populations of elderly people. Therefore, impacts to environmental justice associated with the Proposed Action are not considered to be significant.

FL3.8 INFRASTRUCTURE

FL3.8.1 Installation

FL3.8.1.1 Affected Environment

Potable Water

Potable water for the 125 FW installation is provided by Jacksonville Electric Authority (JEA). Potable water in the area is supplied from a system of 135 groundwater wells and 37 water treatment plants. JEA pumps an average of approximately 107 million gallons of water per year to its customers (JEA 2018a). In calendar year (CY) 2017, 4,958,000 gallons of potable water were supplied to the 125 FW installation (125 FW 2017b).

Wastewater

The 125 FW installation generates wastewater from sanitary, stormwater, and industrial processes, including oil/water separator (OWS) discharge, wash rack discharge, floor wash-down, latrines, sinks, and showers. Wastewater generated within the 125 FW installation is conveyed into the municipal sewage system by JEA. JEA owns 11 wastewater treatment plants that treat more than 75 million gallons of wastewater daily (JEA 2018b).

Stormwater

A high percentage of the active administrative and industrial areas of the installation are paved or roofed, resulting in high runoff rates during precipitation events. As described in the Jacksonville IAP SWPPP (Jacksonville Aviation Authority 2016), much of the stormwater movement is over land flow over aircraft parking areas or automobile parking areas. Water from the parking lots and roads is carried underground to an open ditch swale that runs through the center of the base, from south to north. This swale carries the installation runoff to the south, where it ties into the Jacksonville IAP drainage system. Their system connects into the City of Jacksonville's drainage system, which ultimately discharges into Cedar Creek (see Section FL3.10, *Water Resources*) (125 FW 2013). The stormwater drainage system has been designed to safely collect and transport surface water runoff from storm events to prevent flooding within the installation and is a separate system from the wastewater (sewage) system.

Electrical and Natural Gas Systems

Electricity is supplied to the 125 FW installation by JEA. Natural gas is supplied by Suburban Propane. Electricity consumption for CY 2017 at the 125 FW installation was 6,366,639 kilowatt-

hours. Natural gas propane consumption for CY 2017 at the 125 FW installation was 1,437 gallons (125 FW 2017b).

Solid Waste Management

Municipal solid waste at the 125 FW installation is managed in accordance with the 125 FW Solid Waste Management Plan (125 FW 2017c) and guidelines specified in AFI 32-7042, *Waste Management* (2017). In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for recycling, diversion, handling, storage, collection, and disposal of solid waste; recordkeeping and reporting; and pollution prevention.

The 125 FW installation generates solid waste in the form of office trash, nonhazardous industrial wastes, normal municipal waste, and construction debris. These nonhazardous solid wastes are collected in dumpsters located throughout the 125 FW installation and transported by contractor to the Trail Ridge Landfill in Baldwin, Florida (125 FW 2017c).

Transportation

The 125 FW installation is located within close proximity to several major highways. Interstate 95 is a 6-lane highway that provides regional access to the installation from the north and south, while Interstate 295 is a 4-lane highway that runs east-west and is parallel to the southern boundary of the airport and connects with Interstate 95 southeast of the airport. State Route 102 provides access to the airport from Interstate 95. The installation's main gate is Fang Drive, which can be accessed from Lem Turner Road and Terrell Road.

FL3.8.1.2 Environmental Consequences

Proposed Action

Potable Water

Water consumption would be expected to increase slightly under the Proposed Action as a result of the small increase in personnel; however, an increase of up to approximately 85 personnel on the installation would not be expected to impact regional water supply. Additionally, the demand for water (e.g., if used to control dust) could also increase during demolition and construction phases. However, this increase would be temporary and intermittent and would not be expected to impact regional water supply.

Wastewater

Wastewater generation would be expected to increase slightly as a result of the increase of up to approximately 85 personnel on the installation. However, there have been no deficiencies identified with the existing system, and it is expected that the existing sanitary sewer system is generally adequate to serve the facilities proposed under this alternative.

Stormwater

Under the Proposed Action, there would be up to 468,492 SF (10.8 acres) of temporary soil disturbance, including 81,600 SF (1.9 acres) of new impervious surface as a result of proposed construction. In accordance with the EISA Section 438, any temporary increase in surface water runoff as a result of the proposed construction would be attenuated through the use of temporary and/or permanent drainage management features. The proposed construction activities could temporarily impact the quality of stormwater runoff (see Section FL3.10, *Water Resources*). However, implementation of appropriate standard construction practices (as described previously), preventative maintenance, and periodic inspections and sampling to detect risk to stormwater, especially during active construction activity would minimize these potential impacts. Therefore, impacts to the existing stormwater drainage system would not be significant.

Electrical and Natural Gas Systems

Demand for electricity and natural gas would be expected to increase slightly as a result of the increase in personnel, and the building space and facilities to be constructed would require additional electricity. However, any new facilities and additions associated with the Proposed Action would be implemented with more energy-efficient design standards and utility systems than are currently in place. In addition, construction projects would incorporate Leadership in Energy and Environmental Design and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation. Therefore, average energy consumption would be expected to remain consistent or decrease compared to energy consumption associated with existing facilities.

Construction activity associated with the Proposed Action could result in some temporary interruption of utility services during construction. These impacts would be temporary, occurring briefly during active construction periods. In addition, the demand for energy (primarily electricity) could increase slightly during demolition and construction phases. The energy supply at the installation and in the region is adequate and would not be affected by this temporary increase in demand.

Solid Waste Management

The building space and facilities to be constructed would generate construction and demolition debris requiring landfill disposal. Proposed increases in personnel and equipment use would also contribute to an increase in solid waste generation. However, impacts to local landfills would not be expected to exceed the permitted throughput or contribute significantly to the remaining capacity.

Off-installation contractors completing construction and demolition projects at the 125 FW installation would be responsible for disposing of waste generated from these activities. Contractors would be required to comply with federal, state, and local regulations for the collection and disposal of municipal solid waste from the installation. Much of this material can be recycled or reused, or otherwise diverted from landfills. All non-recyclable construction and demolition waste would be collected in a dumpster until removal. Construction and demolition waste contaminated with hazardous waste, ACM, LBP, or other undesirable components would be managed in accordance with AFI 32-7042, *Waste Management* (2017).

Transportation

Construction equipment would be driven to proposed construction areas and would be kept on-site for the duration of the respective activity. Construction workers would drive daily in their personal vehicles to and from the construction site. In general, construction traffic would result in increases in the use of on-installation roadways during construction activities; however, increases would be temporary and intermittent, occurring only during active construction periods.

The number of authorized personnel on the installation would increase by up to approximately 85 under the Proposed Action (see Section FL2.1.4). The increase in personnel would create a potential of 85 additional one-way vehicle trips to and from the installation during morning and evening peak periods for these additional personnel. Assuming that each person makes two, one-way trips per day, the implementation of the Proposed Action would add an additional 170 trips onto the existing roadway network after the construction phase is complete. However, regional roads used to access the installation, as well as those located on the installation, have sufficient capacity to manage this increase in traffic without substantial impacts to circulation. Therefore, impacts to transportation infrastructure would not be significant under the Proposed Action.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft.

Infrastructure would be expected to remain as described under affected environment in Section FL3.8.1.1. Therefore, there would not be significant impacts to infrastructure under the No Action Alternative.

FL3.8.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for infrastructure was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance, construction, or changes in infrastructure would occur.

FL3.8.3 Summary of Impacts

Under the Proposed Action, there would be no substantial changes expected to potable water, wastewater systems, stormwater management, energy supply systems, solid waste management, or transportation routes. Impacts to infrastructure at the 125 FW installation as a result of the proposed F-35A beddown would not be significant.

FL3.9 EARTH RESOURCES

FL3.9.1 Installation

FL3.9.1.1 Affected Environment

Geology

The 125 FW installation is located in the Atlantic Coastal Plain Province which extends from Massachusetts to Florida and is characterized by low-lying, flat terrain with abundant drainages. The regional geology of northeast Florida consists of Eocene karst limestone that is porous and overlain by quaternary deposits. The karst limestones in northeast Florida is faulted and dips to the northeast and southwest to form an irregular trough or basin with the up thrown block located to the west. The vertical displacement exceeds 125 feet in Duval County with decreasing displacement to the north and the end of the fault in the northern portion of Duval County (FLANG 2015a).

Overlying the Eocene karst limestone are interbedded sands, clays, shales, and silty limestones. The interbedded layers are topped by Pleistocene deposits of unconsolidated sediment at the 125 FW installation. The Pleistocene deposits of unconsolidated sediment generally consist of poorly drained sand with moderate to low permeability and interbedded with muck and clays. The dominant geologic formations in descending order include the Undifferentiated Quaternary Sediments, Hawthorn Group, Ocala Group, Avon Park Limestone, Lake City Limestone, and Oldsmar Limestone. The Undifferentiated Quaternary Sediments comprise the surficial aquifer and consist of two groups with the uppermost unit containing Pleistocene age deposits of soil, muck, coarse to fine sand, shells and clayey sand ranging from 0-120 feet thick. The lower unit, containing Pliocene and Upper Miocene deposits of gray-green calcareous, silty clay and clayey sand with shell beds and white soft limestone beds, ranges from 20 to 110 feet thick. The Hawthorn Group is an aquiclude consisting of gray to blue-green calcareous phosphatic sandy clays and clayey sands, and is approximately 260 to 490 feet thick. In Duval County, the Hawthorn Group is found around sea level. The Ocala Group is a massive carbonate unit consisting of fragmental marine limestones distinguished by slight changes in lithology and fossil content and is divided into three separate formations: Crystal River, the Williston, and the Inglis formations. The depth to the top of the Ocala Group ranges from 300 to 550 feet below MSL and ranges in thickness from 160 to 520 feet. The Avon Park Limestone unconformably underlies the Ocala Group and consists of Eocene aged alternating beds of massive dolomite, granular limestone, and finely crystallized granular dolomite that is located approximately 650 feet below MSL and ranges in thickness of 50 to 250 feet. The Lake City Limestone is an early to middle Eocene carbonate unit consisting of alternating beds of lignitic, chalky to granular limestone, and massive to finely crystalline dolomite, located from 580 to 1,260 feet below MSL, ranging in thickness of from 475 to 490 feet. The Oldsmar Limestone is one of the deepest formations in the Floridian Aquifer located from 1,270 to 1,746 feet below MSL and consisting of early Eocene massive, chalky limestone with finely crystalline dolomite, that is approximately 846 feet thick (FLANG 2015a).

Topography

The local topography is dominated by a series of marine terraces which slope to the east and are a results of successive sea level falls during Pleistocene glaciation. The 125 FW installation is generally level with an elevation of approximately 20 feet above MSL (FLANG 2015a).

Soils

The Natural Resources Conservation Service (NRCS) Soil Survey for Duval County, Florida identifies seven separate soil types on the 125 FW installation with the majority of the soil classified as urban land because it has been extensively developed. The remaining soil types on the installation include Arents, Pelham fine sand, Sapelo fine sand, Mascotte fine sand, Surrency loamy fine sand, and Yulee clay. All of these soils, excluding the Arents, are poorly drained and have low potential for development. Descriptions of the seven soil types are as follows (U.S. Department of Agriculture 2017):

- Urban Land, urban fill, parent material not known;
- Arents, nearly level altered marine deposits, 0-2 percent slope;
- Mascotte fine sand, sandy and loamy marine deposits, 0-2 percent slope;
- Pelham fine sand, sandy and loamy marine deposits, 0-2 percent slope;

- Sapelo fine sand, sandy and loamy marine deposits, 0-2 percent slope;
- Surrency loamy fine sand, depressional, sandy and loamy marine deposits, 0-2 percent slope; and
- Yulee clay, depressional, loamy and clayey marine deposits, 0-2 percent slope (U.S. Department of Agriculture 2017).

FL3.9.1.2 Environmental Consequences

Proposed Action

Under this alternative, new construction would consist of 16 separate projects resulting in up to 468,492 SF (10.8 acres) of new construction footprint, including up to 81,600 SF (1.9 acres) of new impervious surface. The total construction footprint analyzed represents the largest possible footprint of each of the options (Table FL2.1-2). These proposed construction projects would meet all criteria specified in ANG Handbook 32-1084, *Facility Space Standards*.

Geology and Topography

Proposed construction under this alternative would occur within the footprint of the developed 125 FW installation and surrounding lands would not be impacted by any construction-related clearing and grading. As such, impacts to geology and topography would be negligible under the Proposed Action at the 125 FW.

Soils

Proposed construction under this alternative would occur on four soil types, including Arents altered marine deposits (0-2 percent slope), Mascotte fine sand (0-2 percent slope), Pelham fine sand (0-2 percent slope), and Urban land fill. The majority of the proposed construction is on the Urban land fill. The Mascotte fine sand and Pelham fine sand are rated by the NRCS Web Soil Survey as very limited for roads and small commercial building development due to ponding and a shallow depth to the saturated zone. The Arents is rated as somewhat limited due to the shallow depth to the saturated zone and the Urban land fill is not rated. The ANG will enforce appropriate engineering practices necessary in order to construct on these types of soils. In addition, under the Farmland Protection Policy Act, all four soil types are characterized as not prime farmland.

To minimize potential impacts to soil associated with erosion, runoff, and sedimentation during construction activity, standard construction practices as described in the Jacksonville IAP SWPPP (Jacksonville Aviation Authority 2016) would be implemented during and following the construction period. Such practices could include the use of well-maintained silt fences or straw wattles, minimizing surficial areas disturbed, stabilization of cut/fill slopes, minimization of earth-moving activities during wet weather, and covering of soil stockpiles, as appropriate. A

site-specific and detailed SWPPP that coordinates the timing of soil disturbing activities with the installation of soil erosion and runoff controls is an effective way of controlling erosion while soil is exposed and subject to construction activity. A Notice of Intent (NOI) would be filed with the state of Florida to obtain coverage under the General Permit for Stormwater Runoff from construction activities prior to implementation of individual projects. Construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation. Implementation of these measures, as necessary and appropriate, would ensure that impacts to earth resources under the Proposed Action at the 125 FW installation would not be significant.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Earth resources would be expected to remain as described under affected environment in Section FL3.9.1.1. Therefore, there would be no significant impacts to earth resources under the No Action Alternative.

FL3.9.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for earth resources was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance would occur.

FL3.9.3 Summary of Impacts

Under the Proposed Action at the 125 FW installation, proposed construction would result in up to 468,492 SF (10.8 acres) of new construction footprint, including up to 81,600 SF (1.9 acres) new impervious surface. Site-specific SWPPPs would be prepared for each construction project to ensure that runoff would be contained on-site. There are no special status soils associated with any of the proposed construction projects. Impacts to earth resources as a result of the proposed beddown of the F-35A at the 125 FW installation would not be significant.

FL3.10 WATER RESOURCES

FL3.10.1 Installation

FL3.10.1.1 Affected Environment

Surface Water

The 125 FW installation is located within the Jacksonville IAP. Several tidal tributaries of the St. Johns River are found to the northeast of the 125 FW installation and Jacksonville IAP: the Trout River, the Ortega River, the Broward River, and Julington Creek. The main waterbodies that drain the Jacksonville area are the St. Johns River and Nassau River and these tributaries. These rivers ultimately drain to the Atlantic Ocean. Surface waters on the airport and the 125 FW installation consist of several retention ponds, canals, ditches, and creeks (Cedar Creek and Little Cedar Creek). A 2017 Waters of the U.S. (WOTUS) survey identified two WOTUS (surface water ditches) within the installation (Figures FL 3.10-1, FL3.10-2a, and FL3.10-2b) (125 FW 2015). Surface water flows on the installation are complex, due to the large amount of development on the installation and stormwater management. Runoff from the installation flows to the Broward River from Cedar Creek, and much of the stormwater from the area is retained in retention ponds and swales.

The 125 FW installation is covered under Jacksonville IAP's Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity. To comply with the Multi-Sector Generic Permit, the Jacksonville Aviation Authority has prepared an operational SWPPP (Jacksonville Aviation Authority 2016). The SWPPP is intended to be used by Jacksonville IAP and its tenants to provide consistent and effective management of stormwater runoff. The SWPPP was developed to facilitate compliance for affected tenants and provides a discussion of potential pollutant sources resulting from practices and activities at the Jacksonville IAP. The SWPPP also identifies BMPs to reduce or eliminate pollutants from entering the stormwater system or surface waters (Jacksonville Aviation Authority 2016).





Water Resources and Wetlands within the Vicinity of the Proposed Construction at the 125 FW Installation



Figure FL3.10-2b. Water Resources and Wetlands within the Vicinity of the Proposed Construction at the 125 FW Installation

Groundwater

The aquifers under Duval County include a deeper aquifer comprised of porous limestone within the Oldsmar Formation. This is the principal aquifer underlying the 125 FW installation, and is part of the Floridian Aquifer System. This aquifer is composed of a sequence of limestone and dolomite, which thickens from about 250 feet in Georgia to about 3,000 feet in south Florida. The aquifer covers approximately 10,000 square miles and averages 750 feet in thickness. Groundwater depth is moderate and commonly follows the surface topography. The depth of the water table increases slightly in areas of higher terrain. The shallow depth of the groundwater and the permeability of the sediments make the aquifer potentially vulnerable to surface pollutants. The recharge of this aquifer occurs in areas outside of the county, and the water quality of the aquifer ranges from good to poor, with a reduced water quality along the St. Johns River and coastal areas.

There is a shallower aquifer under Duval County that generally consists of limestone, shale, and sand, with a confining clay layer. Recharge of this shallower aquifer occurs from rainfall, and discharge occurs through seepage and well-pumping (125 FW 2014).

Floodplains

Per the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Duval County, Florida, Panels 0181H and 0177H (Map Numbers 120131C0181H and 12031C0177H, Effective June 3, 2013), the 125 FW installation and Jacksonville IAP are located within several areas subject to inundation by 1-percent-annual-chance of flooding (i.e., 100-year floodplain designated as Zones A, AO, or AE) (FEMA 2013). The extent of the 100-year floodplain on the 125 FW installation and Jacksonville IAP is shown in Figure FL3.10-1.

Wetlands

A wetland delineation conducted in 2015 on the 125 FW installation found five isolated, federally non-jurisdictional palustrine emergent and palustrine forested wetlands (total of 5 acres) and four federally jurisdictional palustrine forested wetlands (total of 60 acres) on the installation (see Figure FL3.10-1) (125 FW 2015). In 2017, a second wetland delineation was conducted on the 125 FW installation to survey the remaining areas of the installation that were not surveyed in 2015. During this survey, five federally jurisdictional palustrine forested, emergent and scrub-shrub emergent wetlands (total of 26 acres) were delineated (see Figure FL3.10-1). Forested wetlands within the installation are dominated primarily slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*), bald cypress (*Taxodium distichum*), black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), and wax myrtle (*Morella cerifera*). Emergent wetlands are dominated by a variety of grass and herbaceous species such as Florida reimar grass (*Reimarochloa oligostachya*), and

Scirpus spp. and Carex spp. bahia grass (Paspalum notatum), torpedo grass (Panicum repens), broomsedge (Andropogon virginicus and Andropogon glomeratus), and purple lovegrass (Eragrostis spectabilis). Emergent scrub-shrub wetlands are dominated by wax myrtle, Chinese tallow tree (Triadica sebifera), sweet gum (Liquidambar styraciflua), maidencane (Panicum hemitomon), and torpedo grass (Panicum repens) (125 FW 2018a).

FL3.10.1.2 Environmental Consequences

Proposed Action

Surface Water

Under the Proposed Action at the 125 FW installation, construction and modification projects to support beddown of the F-35A would have the potential to impact surface water resources. As identified in Table FL2.1-2, new construction would consist of several separate projects resulting in up to 468,492 SF (10.8 acres) of new construction footprint, including up to 81,600 SF (1.9 acres) new impervious surface. Several of the projects have more than one option but only one option would be selected for each project. The total construction footprint analyzed represents the largest possible footprint of each of the options (see Table FL2.1-2). These proposed construction projects would meet all criteria specified in ANG Handbook 32-1084, *Facility Space Standards*.

The collective area impacted by the proposed construction activity would exceed 1 acre in size and therefore the 125 FW installation must obtain from the Florida DEP, a Generic Permit for Stormwater Discharge for Large and Small Construction Activities prior to project initiation, according to Florida Administrative Code Rule 62-346. Compliance with this NPDES permit involves developing and implementing a site-specific SWPPP during the construction phase. An Environmental Resource Permit would likely be required also, for land clearing or construction on greater than 1 acre that alters surface water flow. The Environmental Resource Permit regulates stormwater treatment and control (with the goal to achieve pre-construction stormwater conditions) and is turned over to the installation once the construction is complete under the Proposed Action and continues through the life of the site.

The sources of impacts from construction would be limited to the area of ground disturbance at any one time and the duration of construction at each distinct project site. Runoff would only be likely to occur during and following a precipitation event. The site-specific SWPPP would include measures to minimize potential impacts associated with stormwater runoff during construction, including BMPs and standard erosion control measures. These measures include straw bales, sandbags, silt fencing, earthen berms, use of tarps or water spraying, soil stabilization, temporary sedimentation basins, and re-vegetation with native plant species, where possible, to decrease erosion and sedimentation. In accordance with UFC 3-210-10, *Low Impact Development* (LID) (as amended, 2016) and EISA Section 438, any temporary increase in surface water runoff as a result of the proposed construction would be attenuated through the use of temporary and/or permanent drainage management features. Under these requirements, federal facility projects with over 5,000 SF of new impervious surface must maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

In addition, the existing operational SWPPP (Jacksonville Aviation Authority 2016) for Jacksonville IAP would be amended as necessary to reflect post-construction operations and potentially new BMPs. This operational SWPPP provides a management and engineering strategy to improve the quality of stormwater runoff from Jacksonville IAP and thereby improve the quality of the receiving waters. Although there would be a small increase in runoff volumes and rates associated with the additional impervious areas under the Proposed Action at the 125 FW installation, the stormwater management system would be designed in compliance with applicable stormwater regulations. In addition, the airport is currently in compliance with its Multi-Sector Generic Permit and proposed facility designs would follow the Multi-Sector Generic Permit conditions such that no adverse impacts to water quality would result.

Implementation of these measures, as necessary and appropriate, would ensure that impacts to surface water under the Proposed Action at the 125 FW installation would not be significant.

Groundwater

Construction activities and operations under the Proposed Action at the 125 FW installation would include stormwater runoff protection measures that would also serve to protect groundwater quality. By adhering to the provisions of the site-specific SWPPP, implementing BMPs, and amending the existing operation SWPPP for the Multi-Sector Generic Permit, there would be a reduction in stormwater pollutant loading potential and thus a reduction in pollution loading potential to the underlying groundwater basins. Site grading and construction activities would also not reach depths at which groundwater would be affected. Personnel numbers would increase by approximately 85 under the Proposed Action at the 125 FW installation. Therefore, there would be a minor increase in demand on potable water supplies.

Implementation of stormwater runoff protection measures, as necessary and appropriate, would ensure that impacts to groundwater under the Proposed Action at the 125 FW installation would not be significant.

<u>Floodplains</u>

The proposed projects would not occur within a 100-year floodplain zone (FEMA 2013) (see Figures FL3.10-2a and FL3.10-2b). As discussed under surface water, predevelopment hydrology

would be maintained through compliance with LID and EISA and there would no substantial increase in stormwater runoff. Therefore, impacts to flooding that would result from construction activities or operations under the Proposed Action at the 125 FW installation would not be significant.

Wetlands

Nine jurisdictional wetlands have been observed on the 125 FW installation (125 FW 2015; 125 FW 2018a). Approximately 6.8 acres of forested and scrub-shrub wetlands would be impacted by the construction of the new MSA Administration Building and the relocation of the Explosive Ordnance Disposal Range. In addition, Option 2 for the Weapons Loading Training facility would be constructed in a scrub-shrub wetland (see Figure FL3.10-2a). Wetland impacts as a result of the construction would result in a permanent fill of the wetlands. In addition, the relocation of the Explosive Ordnance Disposal Range would result in a clearing of the trees within the wetland. There are no practicable alternatives for the location of these facilities as they must be functionally collocated with the nearby facilities, and the ANG parcel has limited property in which to move the collocated facilities. Compensatory mitigation and federal permitting and state water quality certification, in accordance with Sections 401 and 404 of the CWA, would be necessary for any future construction activities affecting these wetlands. As a result, impacts to wetlands would not be significant. State of Florida permitting under Chapter 62-330, Florida Administrative Code, known as the Statewide Environmental Resource Permit Rule, would also be necessary for any future construction activities affecting these wetlands. Since the proposed projects involve construction in a wetland, a Finding of No Practicable Alternative would be required.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Water resources would be expected to remain as described under affected environment in Section FL3.10.1.1. Therefore, there would be no significant impacts to water resources under the No Action Alternative.

FL3.10.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for water resources was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance or construction would occur.

FL3.10.3 Summary of Impacts

Under the Proposed Action at the 125 FW installation, proposed construction would result in up to 468,492 SF (10.8 acres) of new construction footprint, including up to 81,600 SF (1.9 acres) new impervious surface. Site-specific SWPPs would be prepared for each construction project to ensure that runoff would be contained on-site. Predevelopment hydrology would be maintained through compliance with LID and EISA. BMPs would continue to be implemented to minimize impacts to both surface water and groundwater. None of the construction is proposed within the 100-year floodplain. The MSA Administration Building, the new Weapons Loading Training facility (Option 2), and the new Explosive Ordnance Disposal Range would be constructed within wetlands. Since the proposed projects involve construction in a wetland, a Finding of No Practicable Alternative would be required and federal permitting under Sections 401 and 404 of the CWA would be necessary. Impacts to water resources as a result of the proposed beddown of the F-35A at the 125 FW installation would not be significant.

FL3.11 BIOLOGICAL RESOURCES

FL3.11.1 Installation

FL3.11.1.1 Affected Environment

Vegetation

The majority of the installation (approximately 61 percent) is comprised of developed areas, landscaped areas such as lawns, ornamental trees, or maintained open fields of grass. The remaining portion of the installation is comprised of forest or open woodland (approximately 37 percent), shrubland and grassland (<1 percent), and water (<1 percent). The forest or open woodland communities are comprised of warm temperate forests and temperate flooded and swamp forest. These communities are dominated by loblolly pine (*Pinus taeda*), sweet gum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), swamp tupelo (*Nyssa biflora*), pond-cypress (*Taxodium ascendens*), and tallowtree (*Triadica sebifera*), with a lower stratum of vegetation consisting of wax myrtle (*Morella cerifera*), Elliott's blueberry (*Vaccinium elliottii*), deerberry (*Vaccinium stamineum*), winged sumac (*Rhus copallinum*), and tallowtree. Shrublands and grassland communities are Temperate to Polar Freshwater Marsh, Wet Meadow and Shrubland dominated by peelbark St. Johnswort (*Hypericum fasciculatum*), threadleaf beaksedge (*Rhynchospora fillifolia*), annual rush (*Juncus abortivus*), and broadfruit horned beaksedge (*Rhynchospora careyana inundata*) (125 FW 2018b; FLANG 2015b).

Wildlife

The majority of the wildlife present at the airport and the 125 FW installation consists of species that are highly adapted to developed and disturbed areas. Common bird species observed on the installation during a 2017 fauna survey include the northern cardinal (*Cardinalis cardinalis*), red-bellied woodpecker (*Melanerpes carolinus*), blue jay (*Cyanocitta cristata*), pileated woodpecker (*Dryocopus pileatus*), red-shouldered hawks (*Buteo lineatus*), northern mockingbird, downy woodpecker, eastern towhee, Carolina wren, and house wren (125 FW 2018b). Other common bird species observed on the installation in the past include barn swallows (*Hirundo rustica*), black-bellied plovers (*Pluvialis squatarola*), crows (*Corvus* spp.), eastern meadowlark (*Sturnella magna*), gray catbird (*Dumetella carolinensis*), mourning dove (*Zenaida macroura*), pine warbler (*Dendroica pinus*), red-winged blackbird (*Agelaius phoeniceus*), black vultures (*Coragyps atratus*), broad-winged hawks (*Buteo platypterus*), osprey (*Pandion haliaetus*), and other wading birds, waterfowl, and shorebirds such as cattle egret (*Bubulcus ibis*), great egret (*Ardea alba*), sandhill crane (*Grus canadensis*), great blue heron (*Ardea herodias*), white ibis (*Eudocimus albus*), and snowy egret (*Egretta thula*) (125 FW 2014).

Common mammal species acoustically observed on the installation during the 2017 surveys include the eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), evening bat (*Nycticeius humeralis*), tri-colored bat (*Perimyotis subflavus*), white-tailed deer (*Odocoileus virginianus*), and feral pig (125 FW 2018b, 2018c). Other common mammal species found on the installation or the airport in the past include the eastern red bat, hoary bat, evening bat, tri-colored bat, nine-banded armadillo (*Dasypus novemcinctus*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), red fox (*Vulpes vulpes*), coyotes (*Canis latrans*), Virginia opossum (*Didelphis virginiana*), and the Seminole bat (*Lasiurus seminolus*). Common reptiles and amphibians that have been observed on the installation or the airport in the past include green anole (*Anolis carolinensis*), ground skink (*Scincella laterale*), eastern glass lizard (*Ophisaurus ventralis*), southern fence lizard (*Sceloporus undulatus undulatus*), five-lined skink (*Eumeces fasciatus*), and rough earth snake (*Virginia striatula*). Wetland and marsh areas provide habitat for the southern cricket frog (*Acris gryllus*), pig frog (*Lithobates grylio*), southern leopard frog (*Lithobates sphenocephala*), and green tree frog (*Hyla cinerea*) (125 FW 2014).

Threatened, Endangered, and Special Status Species

Table FL3.11-1 lists federally threatened, endangered, candidate, and state-listed species observed or potentially occurring in the vicinity of the 125 FW installation. No federally- or state-listed species have been observed at the 125 FW installation. A flora and fauna survey was conducted in 2017 and a bat survey was conducted in the spring of 2018 on the installation, and no federally- or state- listed wildlife species were observed at the 125 FW installation during these surveys

(125 FW 2018b, 2018c). Two state-listed plant species, the hooded pitcher plant and the blue flower butterwort were observed during surveys in 2015 and 2017 within the MSA area (FLANG 2015b; 125 FW 2018b). The potential for several federally- and state-listed species to occur within Duval County within the vicinity of the airport exists. Nine federally-listed species and candidate species (4 birds and 5 reptiles/amphibians) and an additional 23 state-listed species (4 birds, 1 mammal, and 18 plants) have the potential to occur within the installation due to the occurrence of potential habitat. There is no critical habitat on the installation. In addition, 41 migratory birds that occur on the U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern list have the potential to be located within the installation (Table FL3.11-2).

(Page 1 of 2)						
Common Name	Scientific Name	Status	Potential Occurrence on the 125 FW Installation	Potential Occurrence Under the Airspace		
Birds						
American oystercatcher	Haematopus palliatus	ST	-	Р		
Bald eagle	Haliaeetus leucocephalus	ST	Р	Р		
Black skimmer	Rynchops niger	ST	-	Р		
Least tern	Sternula antillarum	ST	Р	-		
Peregrine falcon	Falco peregrinus	SE	Р	-		
Piping plover	Charadrius melodus	T/E, ST	Р	Р		
Red knot	Calidris canutus	T, ST	Р	Р		
Red-cockaded woodpecker	Picoides borealis	E, SE	Р	Р		
Southeastern American kestrel	Falco sparverius Paulus	ST	Р	-		
Wood stork	Mvcteria americana	T. ST	Р	Р		

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Alligator mississippiensis

Trichechus manatus

Drymarchon couperi

Ambystoma cingulatum

Gopherus Polyphemus

Notophthalmus perstriatus

Mammals Florida black bear

West Indian manatee

Eastern indigo snake

Frosted flatwoods

Gopher tortoise

salamander

Striped newt

Reptiles and Amphibians American alligator

Table FL3.11-1. Federally- and State-Listed Species Potentially Occurring within the 125FW Installation and Under the Airspace

Table FL3.11-1. Federally- and State-Listed Species Potentially Occurring within the 125FW Installation and Under the Airspace

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Common Name	Scientific Name	Status	Potential Occurrence on the 125 FW Installation	Potential Occurrence Under the Airspace
Plants	-	-	-	
Atlantic Coast Florida lantana	Lantana depressa var. floridana	SE	Р	N/A
Purple honeycomb-head	Balduina atropurpurea	SE	Р	N/A
Bartram's ixia	Calydorea coelestina	SE	Р	N/A
Blue flower butterwort	Pinguicula caerulea	ST	0	N/A
Florida toothache grass	Ctenium floridanum	SE	Р	N/A
Giant orchid	Pteroglossaspis ecristata	ST	Р	N/A
Godfrey's swampprivet	Forestiera godfreyi	SE	Р	N/A
Green ladies'-tresses	Spiranthes polyantha	SE	Р	N/A
Hooded pitcher plant	Sarracenia minor	ST	0	N/A
Nightflowering wild petunia	Ruellia noctiflora	SE	Р	N/A
Piedmont jointgrass	Coelorachis tuberculosa	ST	Р	N/A
Pineland scurfpea	Orbexilum virgatum	SE	Р	N/A
Pondspice	Litsea aestivalis	SE	Р	N/A
Southern lip fern	Cheilanthes microphylla	SE	Р	N/A
Spoon-leaved sundew	Drosera intermedia	ST	Р	N/A
Terrestrial peperomia	Peperomia humilis	SE	Р	N/A
Variable-leaf crownbeard	Verbesina heterophylla	SE	Р	N/A
Yellow sunnybell	Schoenolirion croceum	SE	Р	N/A

Note: * = Overlaps with critical habitat.

Legend: $125 \text{ FW} = 125^{\text{th}}$ Fighter Wing; E = Federally Endangered; N/A = not applicable; O = Observed; P = Potential;

SE = State Endangered; ST = State-Threatened; T= Federally Threatened; U = Unlikely.

Source: USFWS 2017, 2018; Florida Natural Areas Inventory 2017; ANG 2015; 125 FW 2014; FLANG 2015b.

Table FL3.11-2. Migratory Birds that Could Potentially Occur within the 125 FW Installation and Under the Airspace

(Page 1 of 2)

Common Name	Scientific Name	Season	Potential Occurrence on the 125 FW Installation	Potential Occurrence Under the Airspace
American kestrel	Falco sparverius Paulus	Breeding	-	Р
American oystercatcher	Haematopus palliatus	Year Round	Р	Р
Backman's sparrow	Aimophila aestivalis	Breeding	-	Р
Bald eagle	Haliaeetus leucocephalus	Year Round	Р	-
Black rail	Laterallus jamaicensis	Breeding	Р	-
Black skimmer	Rynchops niger	Year Round	Р	-
Blue jay	Cyanocitta cristata	Year Round	0	-
Carolina chickadee	Poecile carolinensis	Year Round	0	-
Carolina wren	Thryothorus ludovicianus	Year Round	0	-
Downy woodpecker	Picoides pubescens	Year Round	0	-
Eastern phoebe	Sayornis phoebe	Nonbreeding	0	-
Eastern towhee	Pipilo erythrophthalmus	Year Round	0	-

Table FL3.11-2. Migratory Birds that Could Potentially Occur within the 125 FW
Installation and Under the Airspace
(Page 2 of 2)

Common Name	Scientific Name	Season	Potential Occurrence on the 125 FW Installation	Potential Occurrence Under the Airspace
Clapper rail	Rallus crepitans	Breeding	-	Р
Common ground-dove	Columbina passerine exigua	Breeding	-	Р
Dunlin	Calidris aplina arcticola	Breeding	-	Р
Eastern whip-poor-will	Antrostomus vociferous	Breeding	Р	Р
Gull-billed tern	Galeochelidon nilotica	Breeding	Р	Р
Henslow's sparrow	Ammodramus henslowii	Breeding	Р	Р
House wren	Troglodytes aedon	Nonbreeding	0	-
Kentucky warbler	Oporornis formosus	Breeding	-	Р
King rail	Ralius elegans	Breeding	Р	Р
Le Conte's sparrow	Ammodramus leconteii	Winter	Р	-
Least tern	Sterna antillarum	Breeding	-	Р
Lesser yellowlegs	Tringa flavipes	Winter	Р	-
Marbled godwit	Limosa fedoa	Winter	Р	Р
Nelson's sparrow	Ammodramus nelsoni	Winter	Р	Р
Northern cardinal	Cardinalis	Year Round	0	-
Northern mockingbird	Mimus polyglottos	Year Round	0	-
Palm warbler	Setophaga palmarum	Nonbreeding	0	-
Pileated woodpecker	Dryocopus pileatus	Year Round	0	-
Prairie warbler	Dendroica discolor	Breeding	-	Р
Prothonotary warbler	Protonotaria citrea	Breeding	Р	Р
Purple sandpiper	Calidris maritima	Winter	Р	-
Red-bellied woodpecker	Melanerpes carolinus	Year Round	0	-
Red-headed woodpecker	Melanerpes erythrocephalus	Year Round	Р	Р
Red-shouldered hawk	Buteo lineatus	Year Round	0	-
Red-throated loon	Gavia stellate	Winter	Р	Р
Ruddy turnstone	Arenaria interpres morinella	Year Round	-	Р
Rusty blackbird	Euphagus carolinus	Winter	Р	Р
Saltmarsh sparrow	Ammodramus caudacutus	Winter	Р	Р
Seaside sparrow	Ammodramus maritimus	Year Round	Р	Р
Semipalmated sandpiper	Calidris pusilla	Winter	Р	Р
Short-billed dowitcher	Limmodromus griseus	Winter	Р	Р
Swallow-tailed kite	Elanoides forficatus	Breeding	Р	Р
Tufted titmouse	Baeolophus bicolor	Year Round	0	-
Whimbrel	Numenius phaeopus	Winter	Р	Р
White-eyed vireo	Vireo griseus	Year Round	0	-
Willet	Tringa semipalmata	Year Round	Р	Р
Wilson's plover	Charadrius wilsonia	Year Round	Р	Р
Wood thrush	Hylocichla mustelina	Breeding	Р	Р

Notes: 125 FW = 125th Fighter Wing; O = Observed; P = Potential; U = Unlikely. Source: USFWS 2017, 2018; 125 FW 2018b.

FL3.11.1.2 Environmental Consequences

Proposed Action

Vegetation

Construction of new facilities under the Proposed Action Alternative at the 125 FW installation would occur primarily on currently paved areas or actively managed (i.e., mowed and landscaped) areas, and would result in a maximum increase of 81,600 SF (1.9 acres) of impervious surfaces. However, approximately 296,652 SF (6.8 acres) of forested and scrub-shrub wetland vegetation would be removed by the construction of the new MSA Administration Building and the relocation of the Explosive Ordnance Disposal Range (see the Wetland section for further discussion).

Wildlife

Although approximately 6.8 acres of forested and scrub-shrub wetland habitat could be removed as a result of construction, similar wildlife habitat is available nearby for wildlife. Noise associated with construction may cause wildlife to temporarily avoid the area, including those that are protected under the Migratory Bird Treaty Act (MBTA). Noise associated with construction activities, as well as an increase in general industrial activity and human presence, could evoke reactions in birds. Disturbed nests in the immediate vicinity of construction activity would be susceptible to abandonment and depredation. Additional analysis for noise impacts to biological resources can be found in Appendix B, *Noise Modeling, Methodology, and Effects.* However, bird and wildlife populations in the vicinity of the airport where project components would occur are accustomed to elevated noise associated with aircraft and general military industrial use. As a result, indirect impacts from construction noise would not be significant because the ambient noise levels within the vicinity are high under the affected environment and would be unlikely to substantially increase by the relatively minor and temporary nature of the proposed construction and modifications. Under the Proposed Action Alternative at the 125 FW installation, impacts to wildlife due to construction would not be significant.

Operational noise levels under the Proposed Action at the 125 FW installation would be expected to increase from current levels with the conversion to the F-35A aircraft. Under the Proposed Action at the 125 FW installation, only the number of aircraft operations would change; there would be no change in where or when individual aircraft operate. Total annual airfield operations at the 125 FW installation are proposed to increase by 1,372 (1 percent). However, the number of acres of land off the airport property that would be exposed to DNL greater than 65 dB would decrease by 688 acres. As a result, changes in operational noise are not expected to impact terrestrial species. In addition, species in the area on and near the installation are likely accustomed to elevated noise levels associated with aircraft and military operations.

An increase in airfield operations may result in a slight increased opportunity for bird/wildlife aircraft strikes to occur, including those with migratory birds. Adherence to the existing BASH program would minimize the risk of bird/wildlife aircraft strikes (see Section FL3.4, *Safety*). The 125 FW has developed procedures designed to minimize the occurrence of bird/wildlife aircraft strikes, and has documented detailed procedures to monitor and react to heightened risk of bird/wildlife aircraft strikes. When risk increases, limits are placed on low-altitude flight and some types of training (e.g., multiple approaches, closed pattern work) in the airport environment. Special briefings are provided to pilots whenever the potential exists for increased bird/wildlife aircraft strikes within the airspace.

Threatened, Endangered, and Special Status Species

Impacts to potentially occurring federally- or state-listed species on the 125 FW installation would be similar to those described under wildlife. That is, studies indicate that wildlife species, whether they are common or protected species, already occupying lands exposed to airfield noise are generally not affected by slight to moderate increases in ambient noise levels, as they have already habituated to periodic to frequent loud overflight noise. Annual airfield operations at Jacksonville IAP are projected to increase. However, no federally- or state-listed wildlife species have been observed on the installation. As a result, there would be no impacts to listed species from implementation of the Proposed Action Alternative. Military readiness operations are exempt from the prohibitions of the MBTA, provided they do not result in a significant adverse effect on population of migratory bird species. Regardless, migratory birds occurring on the installation would already be habituated to aircraft noise from existing operations. An increase in airfield operations may result in a slight increased opportunity for bird/wildlife aircraft strikes to occur, including those with migratory birds. However, adherence to the existing BASH program would minimize the risk of bird/wildlife aircraft strikes (see Section FL3.4, *Safety*).

Two state-listed plant species, the hooded pitcher plant and the blue flower butterwort, occur within the MSA area near the proposed location where the Explosive Ordnance Disposal Range could be relocated and near the proposed MSA Inert Storage and MSA Munitions Assembly Conveyor Pad locations. However, if these projects were implemented, the 125 FW would avoid disturbance to these plant populations.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft.

Biological resources would remain as described in the affected environment in Section FL3.11.1.1. Therefore, there would be no significant impacts to biological resources as a result of the No Action Alternative.

FL3.11.2 Airspace

FL3.11.2.1 Affected Environment

Due to the nature of the actions proposed within the airspace, plant species were excluded from extensive review and analysis because the proposed activities would not result in new ground disturbance, and ordnance delivery and chaff and flare use would not exceed current levels and would occur in locations already used and authorized for those purposes. In addition, marine species, invertebrates, and fish were excluded from review and analysis as they, too, would not likely be impacted by the Proposed Actions.

Wildlife

The airspace associated with 125 FW operations over land covers over 2,829 square miles within Georgia and Florida. Wildlife habitat within these areas occur within the Outer Coastal Plain Mixed Province, which is generally dominated by temperate evergreen forests dominated by evergreen oaks and members of the laurel and magnolia families. Along the Atlantic Coast, coastal marshes and interior swamps are dominated by gum and cypress, while upland areas are dominated by pine forests with an understory of grass savannas (Bailey 1995). A wide variety of wildlife species are found within this habitat, including white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), flying squirrels (*Glaucomys* spp.), rabbits, and numerous species of ground dwelling rodents. Common birds include bobwhite (*Colinus virginianus*), wild turkey (*Meleagris gallopavo*), and numerous migratory waterfowl. The American alligator (*Alligator mississippiensis*) is a common reptile within these habitats (Bailey 1995).

Threatened, Endangered, and Special Status Species

Table FL3.11-1 lists federally threatened, endangered, candidate, and state-listed species observed or potentially occur under the proposed airspace. Ten federally-listed and candidate species (four birds, one mammal, and five reptiles/amphibians) and an additional four state-listed species (three birds and one mammal) have been observed or potentially occur under the proposed airspace. There is no critical habitat for these species under the airspace. In addition, 29 migratory birds that occur on the USFWS Birds of Conservation Concern list have the potential to occur under the airspace (see Table FL3.11-2).
FL3.11.2.2 Environmental Consequences

Proposed Action

Wildlife

No construction would occur beneath the training airspace; however, inert ordnance would be deployed in ranges authorized for their use. Existing range management procedures and vegetation removal guidelines would be adhered to and vegetation management measures currently in place would persist. Impacts to wildlife habitat would not be significant. The only identified countermeasure that would be employed by the F-35A with the potential to affect wildlife habitat is chaff and flares. Chaff and flare deployment is expected to remain the same or decrease from current levels conducted by F-15 aircraft and would occur within the same training areas. Current restrictions on the amount or altitude of chaff and flare use would continue to apply. As a result, chaff and flare deployment associated with the Proposed Action Alternative at the 125 FW installation would have no significant impact on wildlife habitat.

Impacts to migratory birds protected under the MBTA would not be significant. In general, animal responses to aircraft noise appear to be somewhat dependent on, or influenced by, the size, shape, speed, proximity (vertical and horizontal), engine noise, color, and flight profile of planes. Some studies showed that animals that had been previously exposed to jet aircraft noise exhibited greater degrees of alarm and disturbance to other objects creating noise, such as boats, people, and objects blowing across the landscape. Other factors influencing response to jet aircraft noise may include wind direction, speed, and local air turbulence; landscape structures (i.e., amount and type of vegetative cover); and in the case of bird species, whether the animals are in the incubation/nesting phase. Additional analysis for noise impacts to biological resources can be found in Appendix B, *Noise Modeling, Methodology, and Effects*. Noise modeling results suggest subsonic noise levels would increase from 1 to 2 dB within the airspace and would be up to 49 L_{dnmr}; well below the 112 dB shown to elicit major biological responses. Long-term impacts are anticipated to be negligible. Impacts to migratory birds under the MBTA would not be significant.

Section FL3.4, *Safety*, established that bird aircraft strikes are currently rare in the airspace and would not be expected to increase substantially under the Proposed Action Alternative at the 125 FW installation. The F-35A would fly predominantly above 5,000 feet AGL, which is above where 95 percent of strikes occur. Adherence to the BASH Plan would further reduce the likelihood of bird strike in training airspace.

Overall, impacts to wildlife from proposed changes in subsonic and supersonic operations would not be significant for the following reasons: 1) the probability of an animal or nest experiencing overflights more than once per day would be low due to the random nature of flight within the airspace and the large area of land overflown; 2) generally speaking, the F-35A would fly at higher altitudes than F-16 aircraft—the majority (98 percent) of the F-35A operations would occur above 5,000 feet AGL; 3) supersonic flight would only occur above 15,000 feet MSL in the airspace, with 90 percent of these supersonic events above 30,000 feet MSL; and 4) supersonic operations for the 125 FW are not approved for the proposed airspace complexes over land, and would occur in the offshore Warning Areas, more than 12 NM offshore.

Threatened, Endangered, and Special Status Species

Impacts to potentially occurring federally- or state-listed species underlying the 125 FW airspace would be similar to those described within the wildlife section. Under the Proposed Action Alternative for the 125 FW, the amount of time the 125 FW would conduct operations in the associated airspace would increase by approximately 28 percent. However, the F-35As would also fly higher than F-15s, which would reduce the potential to impact species.

Overall, impacts to the federally- and state-listed species from the proposed change in subsonic and supersonic operations would not be significant for the following reasons: 1) the probability of an animal or nest experiencing overflights more than once per day would be low due to the random nature of flight within the airspace and the large area of land overflown; 2) generally speaking, the F-35A would fly at higher altitudes than F-16 aircraft—the majority (98 percent) of the F-35A operations would occur above 5,000 feet AGL; 3) supersonic flight would only occur above 15,000 feet MSL in the airspace, with 90 percent of these supersonic events above 30,000 feet MSL; and 4) supersonic operations for the 125 FW are not approved for the proposed airspace complexes over land, and would occur in the offshore Warning Areas, more than 12 NM offshore. Impacts to federally-listed species would not be significant.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Biological resources would remain as described in the affected environment in Section FL3.11.2.1. Therefore, there would be no significant impacts to biological resources as a result of the No Action Alternative.

FL3.11.3 Summary of Impacts

No sensitive vegetation exists at the proposed construction sites for the 125 FW, and so construction activities would not be expected to affect the flora on the installation. Noise associated with construction activities and/or aircraft operations would not affect wildlife or threatened and endangered species, as they are likely habituated to a relatively noisy environment

already. Anticipated changes to use of the SUA would not be expected to impact biological resources. Impacts to biological resources as a result of the beddown of the F-35A at the 125 FW installation would not be significant.

FL3.12 CULTURAL RESOURCES

FL3.12.1 Installation

FL3.12.1.1 Affected Environment

Archaeological Resources

The 125 FW installation covers 342 acres and approximately 95 acres have been previously surveyed for archaeological resources. The remaining 247 acres that have not been surveyed are primarily part of the built environment or wetlands. All of the potentially undisturbed portions of the 125 FW were surveyed for archaeological resources in 2010. As a result of this survey, no archaeological sites were identified (NGB 2011).

Architectural Resources

The 125 FW installation includes approximately 46 buildings and structures. A comprehensive cultural resources survey of the 125 FW was completed in 2009 and included an inventory and evaluation of all architectural resources built prior to 1990 at the installation. A total of 28 buildings were surveyed and evaluated. Based on the results of this survey, all 28 structures were determined to be not eligible for listing in the National Register of Historic Places (NRHP) (NGB 2011). The Florida SHPO concurred with the determination of eligibility for the 125 FW's pre-1990 architectural resources (Kammerer 2011).

An inventory and evaluation of post-1989 buildings and structures at the 125 FW installation was recently undertaken (NGB 2018a). Nineteen post-1989 buildings and structures at the installation were documented. Most of the surveyed resources consist of various types of storage facilities. The other surveyed resources include a munitions shop, a maintenance shop, a corrosion control facility, a fire station, administration buildings, and personnel support facilities. The current inventory and evaluation recommended that the surveyed architectural resources, either individually or collectively as a historic district, are not eligible for inclusion in the NRHP (NGB 2018a). The NGB is consulting with the Florida SHPO on the eligibility determination.

Traditional Resources

The 125 FW installation contains no known traditional resources; however, 10 federally-recognized Tribes that are historically, culturally, and linguistically affiliated with the

area have been identified. These Tribes include Cherokee Nation of Oklahoma, Chickasaw Nation of Oklahoma, Choctaw Nation of Oklahoma, Eastern Band of Cherokee Indians, Miccosukee Tribe of Indians, Muscogee (Creek) Nation, Poarch Band of Creek Indians, Seminole Nation of Oklahoma, The Seminole Tribe of Florida, and the United Keetoowah Band of Cherokee Indians.

FL3.12.1.2 Environmental Consequences

Proposed Action

Potential direct impacts to cultural resources examined in this analysis include effects of grounddisturbing activities during construction or modification to existing buildings. Indirect impacts from an increase in personnel from 1,992 to 2,077 would not be significant as personnel would primarily be confined to the developed areas on the installation, which lack cultural resources.

Archaeological Resources

The open areas of the 125 FW installation have been intensively surveyed for archaeological resources, and no NRHP-eligible archaeological resources have been identified. It is not expected that undiscovered cultural resources would be found during implementation of the Proposed Action at the 125 FW installation; however, in the event of an inadvertent discovery during ground-disturbing operations, the following specific actions would occur. The project manager would cease work immediately and the discovery would be reported to the 125 FW environmental manager, who would secure the location with an adequate buffer and notify the Commander and the 125 FW cultural resources manager. The environmental manager would then continue to follow ANG Inadvertent Discovery protocol (NGB 2011). Under these conditions, there would be no adverse effects to archaeological resources with implementation of this alternative.

Architectural Resources

Eleven buildings (Buildings 1001, 1005, 1006, 1009, 1014, 1015, 1016, 1017, 1023, 1029, and 1049) at the 125 FW are proposed for additions, infrastructure improvements, and interior renovations. In addition, the 125 FW would demolish Buildings 1044 and 1045 in order to construct a new Flight Simulator building, demolish Building 1035 to construct a new Maintenance and Inspection facility, and demolish 1022 to construct a new Weapons Loading Training facility. Lastly, one of the proposed construction projects would involve demolishing Building 1009 to build a new AGE building in its place. Buildings 1001, 1005, 1006, 1009, 1012, 1014, 1015, 1016, 1017, 1023, and 1029 were previously inventoried and evaluated (NGB 2011). The NGB determined the buildings were not eligible for listing in the NRHP. The Florida SHPO concurred with the determination of eligibility for the 125 FW's pre-1990 architectural resources (Kammerer 2011).

Buildings 1035, 1044, 1045, and 1049 were recently inventoried and evaluated (NGB 2018a). The NGB determined the buildings were not eligible for listing in the NRHP and is consulting with the Florida SHPO on its eligibility finding. It is anticipated there would be no adverse effects to architectural resources as a result of implementation of this alternative.

Traditional Resources

No formal surveys for traditional cultural resources or sacred sites have been conducted. However, given the disturbed nature of the installation, the presence of intact traditional cultural properties is unlikely (USAF 2013). Government-to-government consultation between the NGB and each federally-recognized Tribe associated with the 125 FW installation is being conducted for this action in recognition of their status as sovereign nations, to provide information regarding Tribal concerns per Section 106 of the NRHP as well as information on traditional resources that may be present on or near the installation. An initial phone call to Tribal offices to verify contact information and current Senior-level Tribal Officials before any materials were mailed to the American Indian Tribe was completed in late October/early November 2017. An initial government-to-government consultation letter was sent to 10 federally-recognized American Indian Tribes with ancestral ties to the 125 FW installation in February 2018. These 10 American Indian Tribes included Miccosukee Tribe of Indians, Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Tribe of Florida, Cherokee Nation of Oklahoma, Eastern Band of Cherokee Indians, Choctaw Nation of Oklahoma, Chickasaw Nation of Oklahoma, Seminole Nation of Oklahoma, and United Keetoowah Band of Cherokee Indians.

After the initial government-to-government consultation letter was sent, NGB followed up with telephone calls and emails in an effort to increase accessibility and encourage communication in the event an American Indian Tribe would have any concerns regarding the Proposed Action or land below the affected airspace areas.

The Seminole Nation of Oklahoma responded via e-mail that they would like to be included in any consultation pursuant to the Proposed Action, and also requested that a full flora inventory be conducted in each area of interest. The Seminole Nation of Oklahoma also requested a face-to-face meeting to discuss the project (Isham 2018).

To date, no other responses have been received from federally-recognized American Indian Tribes associated with the 125 FW installation.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action

Alternative, the ANG would continue to conduct their current mission using existing aircraft. Cultural resources would be expected to remain as described under affected environment in Section FL3.12.1.1. Therefore, there would not be significant impacts to cultural resources under the No Action Alternative.

FL3.12.2 Airspace

FL3.12.2.1 Affected Environment

There are 31 NRHP-listed cultural resources located under the airspace used by the 125 FW, including private residences, businesses, courthouses, churches, historic districts, schools, a jail, a military fort, and a pavilion. One of these NRHP-listed cultural resources, Dorchester Academy Boys' Dormitory, is also designated a National Historic Landmark (National Park Service 2014). No American Indian reservations underlie the airspace and no traditional cultural properties are known within this area.

Government-to-government consultation between the NGB and each federally-recognized Tribe associated with the 125 FW installation is being conducted for this action in recognition of their status as sovereign nations, to provide information regarding Tribal concerns per Section 106 of the NRHP as well as information on traditional resources that may be present on or near the installation.

An initial phone call to Tribal offices to verify contact information and current Senior-level Tribal Officials before any materials were mailed to the American Indian Tribe was completed in late October/early November 2017. An initial government-to-government consultation letter was sent to 10 federally-recognized American Indian Tribes with ancestral ties to lands beneath the associated airspace in February 2018. These 10 American Indian Tribes included Miccosukee Tribe of Indians, Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Tribe of Florida, Cherokee Nation of Oklahoma, Eastern Band of Cherokee Indians, Choctaw Nation of Oklahoma, Chickasaw Nation of Oklahoma, Seminole Nation of Oklahoma, and United Keetoowah Band of Cherokee Indians.

After the initial government-to-government consultation letter was sent, NGB followed up with telephone calls and emails in an effort to increase accessibility and encourage communication in the event an American Indian Tribe would have any concerns regarding the Proposed Action or land below the affected airspace areas. Correspondence sent to the American Indian Tribes is located in Appendix A. No American Indian reservations underlie the airspace associated with the 125 FW.

The Seminole Nation of Oklahoma responded via e-mail that they would like to be included in any consultation pursuant to the Proposed Action, and also requested that a full flora inventory be

conducted in each area of interest. The Seminole Nation of Oklahoma also requested a face-to-face meeting to discuss the project (Isham 2018).

The Cherokee Nation of Oklahoma mentioned on a follow-up phone call that the 125 FW airspace is not in their AOC so there is no need to send any further correspondence regarding this alternative (Toombs 2018).

To date, no other responses have been received from the federally-recognized American Indian Tribes associated with lands beneath the airspace associated with the 125 FW installation.

FL3.12.2.2 Environmental Consequences

Proposed Action

Under the Proposed Action Alternative for the 125 FW, the amount of time the 125 FW would conduct operations in the associated airspace would increase by approximately 28 percent. However, these changes would be a continuation of existing operations within the area and would not result in a change in setting to any eligible or listed archaeological, architectural, or traditional cultural property.

Under the Proposed Action, changes in noise levels would range from -1 to +2 dB, but would remain well below 65 dB L_{dnmr} . While the F-35A would fly more sorties in the MOAs, they generally would do so at higher altitudes than the F-15Cs, so the noise effect of the increased sorties is largely offset by use of higher altitudes. The largest change would be under the Palatka MOAs, which would increase by 2 dB from 44 to 46 dB L_{dnmr} . Supersonic noise does not occur within the over land ranges and offshore supersonic flight was not modeled. Therefore, no damage to historic structures would occur. Risk of impacts to structures would not be significant at this level of pounds per square foot (psf) (Battis 1988; Haber and Nakaki 1989).

Visual intrusions under the Proposed Action would not be significant and would not represent an increase sufficient to cause adverse impacts to the settings of cultural resources. Due to the high altitude of the overflights, small size of the aircraft, and the high speeds, the aircraft would not be readily visible to observers on the ground.

No additional ground disturbance would occur under the airspace due to the Proposed Action. Use of ordnance and defensive countermeasures would occur in areas already used for these activities. Flares deployed from the aircraft would not pose a visual intrusion either, as flares are small in size and burn only for a few seconds and the high relative altitude of the flights would make them virtually undetectable to people on the ground. Overall, flares are unlikely to adversely affect cultural resources. Therefore, the introduction of material to archaeological sites or standing structures from the use of flares would not have an adverse effect on these resources.

Proposed use of the airspace would be similar to ongoing training operations. Given the current use of the airspace and the nature of the proposed future use of the project area, there would be no adverse effects to NRHP-eligible or listed archaeological resources, architectural resources, or traditional cultural properties. The NGB is consulting with the Florida and Georgia SHPOs on its finding of effect for the Proposed Action.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Cultural resources would remain as described in the affected environment in Section FL3.13.2.1. Therefore, there would not be significant impacts to cultural resources as a result of the No Action Alternative.

FL3.12.3 Summary of Impacts

There are no archaeological sites within any of the proposed construction footprints at the 125 FW installation. In the event of an inadvertent discovery during ground-disturbing operations, work would cease and procedures would be implemented to manage the site prior to continuation of work. Buildings 1035, 1044, 1045, and 1049 were recently inventoried and evaluated (NGB 2018a). The NGB determined the buildings were not eligible for listing in the NRHP and is consulting with the Florida SHPO on its eligibility finding. It is anticipated there would be no adverse effects to architectural resources as a result of implementation of this alternative. The other facilities included in the construction modifications are not eligible for the NRHP. No traditional cultural resources have been identified at the 125 FW installation, though government-to-government consultation with associated Tribes is ongoing and will continue throughout the EIAP. Use of the SUA under the Proposed Action would be similar to ongoing operations. Impacts to cultural resources as a result of the proposed F-35A beddown at the 125 FW installation would not be significant.

FL3.13 HAZARDOUS MATERIALS AND WASTES, AND OTHER CONTAMINANTS

FL3.13.1 Installation

FL3.13.1.1 Affected Environment

Hazardous Materials

Hazardous materials are used at the 125 FW installation for aircraft operations and maintenance which includes petroleum, oil, and lubricant (POL) management and distribution. Types of

hazardous substances found on the 125 FW Installation include solvent solder (lead and silver), batteries, liquid cooling oil, lubricating oils, sludge oil, hydraulic fluid, paint, jet propellant (Jet A), diesel fuel, motor gasoline, antifreeze, scrap metal, bead blast medals (lead and cadmium), and contaminated solids (USAF 2013).

There are currently 26 aboveground storage tanks (ASTs) on the 125 FW in 16 buildings, including Buildings 1002, 1004, 1005, 1006, 1007, 1018, 1024, 1028, 1029, 1035, 1045, 1049, 1050, 1060, 1111, and 1810.

- Twenty of the 26 ASTs are used to store diesel fuel and range in capacity from 66 to 4,000 gallons,
- Jet A fuel is stored in four of the 26 ASTs ranging in capacity from 300 to 110,631 gallons,
- One 2,000-gallon AST is used to store motor vehicle unleaded gasoline, and
- One 2,000-gallon AST is used to store purging fluid (FLANG 2017b).

There are currently no active underground storage tanks (USTs) on the 125 FW installation (Florida DEP 2017b).

Toxic Substances

Regulated toxic substances typically associated with buildings and facilities include asbestos, LBP, and polychlorinated biphenyls (PCBs). ACM is known to occur in three buildings, including Buildings 1001, 1018, and 1023. An asbestos facility register is maintained by an Asbestos Operations Officer that is appointed by the Base Civil Engineer. All known friable asbestos has been removed from the installation (USAF 2013).

A LBP survey was conducted in 1997 at the 125 FW installation. Positive lead results were found in Buildings 1001, 1002, 1003, 1005, 1006, 1007, 1012, 1013, 1018, 1019, 1023, 1028, 1029, 1030, 1035, and 1049. Additionally, any building on the installation constructed prior to 1978 are presumed to contain LBP and would be tested for LBP prior to demolition or renovation (USAF 2013).

The installation is considered to be PCB-free and there are no PCB transformers on the installation. Other potential PCB-contaminated equipment within the installation includes ballasts for light fixtures. All known PCBs and PCB-containing ballasts or ballasts not specifically labeled as PCB-free are disposed of as PCB-containing material by the Environmental Management Office (USAF 2013).

Hazardous Waste Management

The 125 FW Oil and Hazardous Substances Spill Prevention and Response Plan contains the governing regulations for spill prevention and describes specific protocols for preventing and responding to releases, accidents, and spills involving oils and hazardous materials (FLANG 2017b). The 125 FW Hazardous Waste Management Plan outlines procedures for controlling and managing hazardous wastes from the point where they are generated until they are disposed. It also includes guidance for compliance with all federal, state, and local regulations pertaining to hazardous waste. In addition, the Hazardous Waste Management Plan includes a pollution prevention section that details the methods the installation uses to reduce or eliminate the use of toxic or hazardous substances and the generation of hazardous waste wherever possible through source reduction and environmentally sound recycling (125 FW 2017d).

The 125 FW is regulated as a Small Quantity Generator (SQG) of hazardous waste and maintains USEPA Identification Number FL3570028446. A hazardous waste generator point is where the waste is initially created or generated. A satellite accumulation point (SAP) is an area where hazardous waste is initially accumulated at the point of generation that is under the control of the SAP manager. Hazardous wastes initially accumulated at a SAP are accumulated in appropriate containers before being transferred to the installation central accumulation point (CAP). A generator may accumulate as much as 55 gallons of hazardous waste or one quart of acute hazardous waste at each SAP without a permit. There are eight SAPs (where a waste is initially accumulated) on the installation located in Buildings 1001, 1005, 1022A, 1029, 1039, 1042, 1049, and the flight line. The installation CAP is located next to Building 1042 where hazardous waste can accumulate in containers for up to 180 days. The 125 FW also has a CAP for universal waste at Building 1039 (125 FW 2017d).

OWSs are used to separate oils, fuels, sand, and grease from wastewater and to prevent contaminants from entering the sanitary sewer and stormwater drainage systems. OWSs at the 125 FW installation are considered wastewater control devices or secondary containment storage containers. Currently, there are nine OWSs (S-001 through S-006, S-038, UTC 7-2, and UTC 21-3) on the 125 FW installation located at Buildings 1007, 1012, 1023, 1029, 1035, and 1404. The OWSs range in capacity from 200 to 11,500 gallons, six of the OWSs discharge into the sanitary sewer, and three of the OWSs discharges into the storm sewer. Four of the OWSs (S-001, S-002, UTC 7-2, and UTC 21-3) are considered secondary containment storage containers. OWS, S-001, is currently inactive. OWSs are maintained by Civil Engineering and are inspected quarterly, maintained at an interval based on the calculated facility usage rate, and cleanout is performed annually (FLANG 2017b).

Environmental Restoration Program

Eleven potentially contaminated ERP sites were identified at the 125 FW installation. The installation has been investigated under the ERP from 1986 to the present. Ten of the 11 sites have received Site Rehabilitation Completion Orders from the Florida DEP. ERP Site 3E underwent long-term monitoring and Florida DEP concurred with the Draft Final Site Rehabilitation Completion Report (Florida DEP 2017b); the Final Site Rehabilitation Completion Report is pending. One of the 11 ERP sites, ERP Site 4 OWS at Hush House, is adjacent to an area of planned construction to support the proposed F-35A operations discussed in Section FL2.1.3. Table FL3.13-1 provides details for the 11 ERP sites and Figure FL3.13-1 shows the locations of the 11 ERP sites (125 FW 2017e).

Along with the 11 ERP sites, there are six open UST sites that correspond to former USTs 12,16, 23, 24, 27, 30, and 31 and are being investigated under the Compliance Restoration Site Program in accordance with the Florida DEP Storage Tank System Closure Assessment Requirements (125 FW 2017e). Figure FL3.13-2 shows the locations of the six UST sites. Four of the USTs (12, 27, 30, and 31) were investigated in the 2011 Site Assessment, the 2014 supplemental site investigation, and the supplemental 2015 supplemental site investigation sampling. Based on the investigations, all four UST sites corresponding to USTs 12, 27, 30, and 31 are recommended for a Site Rehabilitation Completion Report with no institutional controls or risk reclassifications (125 FW 2016b). The remaining two UST sites associated with former USTs 16, 23, and 24 were investigation. These two sites were recommended for remedial actions in the 2017 Feasibility Study (125 FW 2017f). Both UST sites recommended for remedial action, UST 16 and UST 23/24, is located adjacent to an area of planned construction to support the proposed F-35A operations.

Also under the Compliance Restoration Site Program, two AOCs were investigated in a Site Assessment Report in 2017 and are shown in Figure FL3.13-2. The two AOCs are the Hush House (NW020), which is broken out into three AOCs and the Former Tank Farm (NW021). The Hush House (NW020) is located on the eastern side of the installation and is where an approximately 900-gallon JP-8 fuel spill occurred in 2013. AOC-1 of the Hush House is located in a grassy area south of the Hush House, AOC-2 is located in a grassy area to the west/northwest of the source area, and AOC-3 is a concrete and asphalt paved area adjacent to the west of the Hush House. The Former Tank Farm is located on the west side of the installation and consisted of five former USTs: two 30,000-gallon; one 40,000-gallon; and two 50,000-gallon USTs that stored JP-4. The Former Tank Farm corresponds to ERP Site 11. Based on the results of the Site Assessment, the Site Assessment Report recommended that further investigation be completed at the Hush House AOC-2 and AOC-3 and at the Former Tank Farm (125 FW 2017g). Hush House AOC-2 and AOC-3 are located in areas of planned construction to support the proposed F-35A operations.

Table FL3.13-1. ERP Sites within the 125 FW Installation(Page 1 of 2)

ERP Site	Materials of Concern	Status		
1: OWS Inlets near Air Craft Parking Apron	Air Craft This site consists of the area surrounding three OWS drains at the northern edge of the aircraft parking apron where runoff from spills has been allowed to flow over and around the OWSs when the OWSs were not manually opened. Two site investigations were conducted in 1989 and 1995 in which chromium and VOCs were detected in groundwater. The Florida DEP concurred with NFA in 1997 and the site was closed in 2002.			
2: Subsurface of Aircraft Parking Apron	Aircraft This site was identified when a trench was excavated through the aircraft parking apron and workers were overcome by fumes and required to wear respiratory protection. The suspected source of contamination was from seepage of fuel spills through pavement joints on the parking apron. VOCs were detected under regulatory limits in groundwater and lead was detected above regulator limits. The 1995 Final Site Investigation Report recommended NFA because access to the contaminated groundwater was limited by the parking apron and offsite migration was unlikely. Florida DEP concurred with NFA in 1997 and the site was closed in 2002			
3: FTA; Eastern FTA – 3E; Western FTA – 3W	This site consists of the eastern $FTA - 3E$ used from mid-1970s until 1984 and the western $FTA - 3W$ used from 1968 until the mid-1970s. Approximately 6,400 gallons of hazardous waste were estimated to have been released at each FTA with approximately 30% (2,000 gallons) evaporated, seeped into the ground, or migrated to surface runoff.	Closed		
4: OWS at Hush House This site consists of the area surround the OWS on the south side of the Hush House, which received large quantities leaked fuel from F-106 planes that would cause the OWS to overflow and discharge in the nearby drainage-way. The 19 SI recommended NFA based on low contaminant concentrations, unlikely potential for exposure, and low contaminant transport. Florida DEP concurred with NFA in 1997 and the site was closed in 2002.		Closed		
5: OWS at Vehicle Maintenance Building	5: OWS at Vehicle Maintenance Building and spills from the floor drain of the Vehicle Maintenance Building. VOCs were detected above regulatory limits in groundwater. However, Site 10 was suspected to be the source and Florida DEP concurred with NFA in 1997. This site was closed in 2002.			
6: Area Outside Munitions Building	Area Outside Munitions ilding This site is an area outside the Munitions Building where between 1968 and 1980 solvents, lacquer thinner, and paint were poured on the ground. During 1990 and 1991, soil visibly contaminated with paint was excavated and removed. The 1995 SI recommended NFA and Florida DEP concurred in 1997. The site was closed in 2002.			
7: Trim Pad for Aircraft Run- p This site consists of a concrete pad located in the eastern portion of the installation near the FTA at Site 3W and has been used for trimming jet engines since 1968. Spills of up to 400 gallons of JP-8 fuel were reportedly washed off the pad with fire hoses. No analytes were detected above regulatory limits and the 1995 SI recommended NFA with Florida DEP concurrence in 1997. The site was closed in 2002.		Closed		
8: Separator at Wash Rack	This site consists of a wash rack where various solvents and cleaners were used and washed into an OWS to the west. VOCs and naphthalene were detected in soil samples at Site 8 but were determined to not be a source of groundwater contamination. The 1995 SI recommended NFA and Florida DEP concurred in 1997. The site was closed in 2002.	Closed		
9: 10,000 Gallon Diesel Fuel Tank	This site consists of two USTs, one 10,000 gallon UST used for #6 heating oil installed in 1968 and used until 1987 and a second UST installed in 1987 containing #2 heating oil. In 1990 a release of approximately 2,000 gallons of heating oil was reported. After eight rounds of quarterly groundwater sampling, Florida DEP concurred with NFA in 1997 and the site was closed in 2002.	Closed		

Table FL3.13-1. ERP Sites within the 125 FW Installation(Page 2 of 2)

ERP Site	Materials of Concern	Status
10: Vehicle Maintenance Facility	This site consists of two former 2,000-gallon USTs that contained leaded gasoline and the surrounding area on the north side of the vehicle maintenance facility. One UST was used from 1968 through 1992 and the other UST was used from 1968 until 1988 when fuel leaks were detected from the piping system. VOCs and PAHs were detected in groundwater and groundwater was monitored from 1995 to 1997. A remedial action was suggested for the site and the action was carried out in 2005 and 2006. Groundwater monitoring was again conducted quarterly from 2004 through 2007. The site was closed in 2015 after four consecutive groundwater events where concentrations were below regulatory limits.	Closed
11: JP-4 Release at the POL Facility	This site is located at the POL facility and consists of the area surrounding two 50,000 gallons, one 40,000 gallon, and two 30,000 gallons JP-4 USTs, including the above ground piping. In 1991, a surface spill of approximately 583 gallons occurred. The response included recovery of about 140 gallons of free product, contaminated soil excavation to a depth of 3 feet below ground surface, and a Site Assessment that involved sampling from June to September 1999. The site was recommended for NFA in March 2006, Florida DEP concurred with NFA in May 2006, and the site was closed in 2007.	Closed

Legend: DEP = Department of Environmental Protection; FTA = Fire Training Area; NFA = No Further Action; OWS = Oil/Water Separator; PAH = Polyaromatic Hydrocarbon; POL = Petroleum, Oil, and Lubricant; UST = Underground Storage Tank; VOC = Volatile Organic Compound.





The *Final Site Inspection Report, Air National Guard Phase II Regional Site Inspections for Per and Polyfluoroalkyl Substances* (NGB 2018b) evaluated 12 PRLs and recommended all 12 PRLs for further investigations to determine the nature and extent of Per- and Polyfluoroalkyl Substances contamination. Figure FL3.13-2 shows the locations of the 12 PRLs. The 12 potential release areas are as follows:

- Site 3W,
- Site 3E,
- Hangar 1001,
- Hangar 1029,
- Old Fire Station #1 (Building 1009),
- Old Fire Station #2 (Building 1018),
- Current Fire Station (Buildings 1044 and 1045),
- Plane Fire Area,
- Former Aqueous Film Forming Foam Test Area,
- Base Supply Aqueous Film Forming Foam Storage (Building 1013),
- Aircraft Parking Apron, and
- Stormwater Outfall OF1.

Five of the 12 potential release areas are located in areas of planned construction to support the proposed F-35A operations discussed in Section FL2.1.3. These five potential release areas include Hangar 1001, Hangar 1029, Old Fire Station #1, Old Fire Station #2, and Current Fire Station. The highest concentrations of PFOS/PFOA in any single sample found during the Site Investigation in the five PRLs within the planned areas of construction are presented in Table FL3.13-2.

Building	Max. Soil (PFOS/PFOA) mg/kg	Max. Groundwater (PFOS/PFOA) μg/l
Hangar 1001 (PRL 3)	0.032 / 0.00029 J	0.009 J / 0.016
Hangar 1029 (PRL 4)	0.028 / 0.00073	0.37 / 0.42
Old Fire Station #1 (PRL 5)	0.041 / .0037	9.1 / 1.5
Old Fire Station #2 (PRL 6)	0.046 / 0.00041 J	8.8 / 0.15 U*
Current Fire Station (PRL 7)	0.082 / 0.0043 J	10.0 / 0.56

Table FL3.13-2. PFOS/PFOA Potential Release Locations that Intersect Proposed Construction

Notes: $1 \mu g/l = 1$ part per billion = 1,000 parts per trillion.

J – estimated concentration.

U* - Reported value changed to non-detect at elevated quantitation limit due to a blank detection.

Legend: $\mu g/l = microgram per liter; mg/kg = milligram per kilogram; PFOA = Perfluorooctanoic Acid; PFOS = Perfluorooctane Sulfonate; PRL = Potential Release Location.$

FL3.13.1.2 Environmental Consequences

Proposed Action

Hazardous Materials

Training activities and other functions related to the current F-15C program would be expected to remain similar for the F-35A beddown. With computerized self-tests for all systems, the F-35As are expected to reduce maintenance time and cost as well as reducing the need for maintenance since the F-35As are newer aircraft. This reduction in maintenance activities associated with the F-35As would result in a slight reduction of the amount of hazardous waste generated. The major differences would be the omission of cadmium fasteners, chrome plating, copper-beryllium bushings, and the use of a non-chromium primer instead of primers containing cadmium and hexavalent chromium currently used for fighter aircraft (Fetter 2008; Luker 2009).

Under this alternative, the total annual number of F-35A operations would increase to 6,222 from 4,850 F-15C operations which is a 28 percent increase in annual operations and approximately a 1.0 percent increase in total aircraft operations at the airfield. The increase in airfield operations would increase the throughput of petroleum substances (e.g., fuels, oils) used during F-35A operations. In addition to the increased amount of fuel usage associated with increased aircraft operations, a short-term increase of fuels used during construction activities (e.g., diesel, gasoline) is expected to run earth-moving equipment and power tools and provide electricity and lighting.

Procedures for hazardous material management established for the 125 FW would continue to be followed in future operations associated with the Proposed Action and as required during all construction and renovation activities.

Toxic Substances

Under this alternative, 16 construction projects are proposed to accommodate the beddown of the F-35As. ACM is not known to occur in any of the planned construction areas. A LBP survey was conducted at the 125 FW in 1997. Any buildings built before 1978 may contain LBP and would be tested for LBP prior to demolition or renovation. All buildings included in the planned construction would be inspected for ACM and LBP according to established ANG procedures prior to any construction. All ACM would be properly removed and disposed of prior to construction in accordance with 40 CFR 61.40 through 157. LBP would be managed and disposed of in accordance with Toxic Substances Control Act, OSHA regulations, Florida requirements, and established ANG procedures. Materials suspected to be contaminated with PCBs (especially discarded oil products, light fixtures, and transformers) would be screened for PCB contamination prior to disposal.

Hazardous Waste Management

The number of hazardous waste streams generated by F-35A operations would be expected to be less than those being generated by the existing F-15C aircraft because operations involving cadmium and hexavalent chromium primer, and various heavy metals have been eliminated or greatly reduced for the F-35A (Fetter 2008; Luker 2009). As with hazardous materials, the waste streams that are targeted for omission or substitution as aircraft are transitioned to the F-35A would decrease over the amounts currently generated by maintaining F-15C aircraft.

Under this alternative, the total number of aircraft operations for the 125 FW would increase approximately 28 percent; therefore, hazardous waste generation would be expected to increase commensurately. The increase in the hazardous waste is supported by the current infrastructure at the installation. Hazardous waste generation would continue to be managed in accordance with the installation's Hazardous Waste Management Plan and all applicable federal, state, and local regulations. Additionally, no changes to the installation's SQG status would be expected to occur due to the increase in hazardous waste generation from aircraft operations.

Environmental Restoration Program

In accordance with AFI 32-7020, The Environmental Restoration Program, construction, modifications, and/or additions to existing buildings can occur on or in proximity to existing ERP sites. Accordingly, the appropriate organizations (e.g., installation planners, ERP managers, design engineers) must consider a compatible land use based on current site conditions and the selected or projected remedial action alternatives. If the potential for uncharacterized ERP sites exist, the installation is responsible for identifying existing contamination at the proposed construction sites to avoid unknowingly locating construction projects in contaminated areas. The installation is responsible for performing necessary environmental baseline surveys, accomplishing EIAP requirements, and for otherwise being informed about existing site conditions and associated cost impacts in preparation for a construction project. When warranted by the site history, environmental restoration funds may be used to accomplish Resource Conservation and Recovery Act (RCRA) facility assessments, or preliminary assessments and site inspections undertaken in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, or similar site investigations in accordance with applicable state laws for suspected releases. To the extent that a construction project generates actions to address contamination, or a need to change the timing of ERP-generated actions to address contamination, the costs of such actions are not Environmental Restoration Account-eligible and shall be funded as part of the construction project. This includes the handling, mitigation, and disposal or other disposition of contamination discovered before or during the construction activity.

The removal and disposal of unexpected contamination encountered within the construction project footprint would be undertaken as part of the construction project using project funds which may include other military construction (MILCON) funds reprogrammed to a MILCON construction project. Construction contractor costs (such as direct delay costs and unabsorbed or extended overhead) incidental to discovery and removal of the contamination would be construction project funded to the extent that the government is responsible and liable for such costs.

Vapor intrusion should be evaluated when volatile chemicals are present in soil, soil gas, or groundwater that underlies existing structures or has the potential to underlie future buildings and there may be a complete human exposure pathway. Due to their physical properties, volatile chemicals can migrate through unsaturated soil and into the indoor air of buildings located near zones of subsurface contamination.

One ERP site, Site 4 OWS at Hush House, is adjacent to the proposed construction under this alternative (Figures FL3.13-3a and FL3.13-b). ERP Site 4 is closed and does not pose a threat to human health or the environment. However, the proposed construction is adjacent to two UST sites (UST 16 and UST 23/24) recommended for remedial action, one AOC (Hush House AOC-2 and AOC-3), and five PFOS/PFOA potential release areas, (Hangar 1001, Hangar 1029, Old Fire Station #1, Old Fire Station #2, and Current Fire Station) as shown in Figures FL3.13-4a and FL3.13-4b. UST 16 is adjacent to the proposed facility to the north of Building 1404, UST 23/24 is adjacent to planned construction at Building 1009, Hush House AOC-2 and AOC-3 are located in the vicinity of the planned construction for Option 2 for the Weapons Loading Training facility, both Hangars 1001 and 1029 are proposed to be renovated, the Old Fire Station #1 is located at the proposed area for the new AGE building, and Current Fire Station is located adjacent to the proposed area for the new Flight Simulator building.

Per the Site Investigation Report, no soil samples exceeded the risk-based screening level for PFOS/PFOA within the planned construction area. The Groundwater samples exceeded the USEPA Lifetime Health Advisory for drinking water of 70 parts per trillion (ppt) at all locations within the planned construction area, except Hangar 1001 (PRL 3). The next step in the CERCLA process is the Remedial Investigation. During the Remedial Investigation, the agency will collect detailed information to characterize site conditions, determine the nature and extent of the contamination, and evaluate risks to human health and the environment posed by the site conditions by conducting a baseline ecological and human health risk assessment. The CERCLA process will continue regardless of any construction activities. Construction activities, to include the handling, mitigation, and disposal or other disposition of contamination discovered before or during the construction activity, will proceed in accordance with all applicable legal requirements. It is recommended that direct contact with groundwater and soil be limited during all construction adjacent to the two UST sites, one AOC, and five PFOS/PFOA potential release areas.



Environmental Restoration Program Sites within the Vicinity of the Proposed Construction at the 125 FW Installation



Figure FL3.13-3b. Environmental Restoration Program Sites within the Vicinity of the Proposed Construction at the 125 FW Installation



Figure FL3.13-4a.

Areas of Concern and Perfluorinated Compound Potential Release Location Sites within the Vicinity of the Proposed Construction at the 125 FW Installation



Figure FL3.13-4b.

Areas of Concern and Perfluorinated Compound Potential Release Location Sites within the Vicinity of the Proposed Construction at the 125 FW Installation If contaminated media (e.g., soil, vapor, groundwater) was encountered during the course of site preparation (e.g., clearing, grading) or site development (e.g., excavation for installation of building footers) for proposed construction activities, work would cease until 125 FW environmental manager establishes an appropriate course of action for the construction project to ensure that any applicable federal and state agency notification requirements are met, and to arrange for agency consultation as necessary if existing ERP, UST, AOC, or PFOS/PFOA sites are affected.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 125 FW installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Hazardous materials and waste would be expected to remain as described under affected environment in Section FL3.13.1.1. Therefore, there would be no significant impacts to hazardous materials and waste under the No Action Alternative.

FL3.13.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for hazardous materials and wastes was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance or construction would occur.

FL3.13.3 Summary of Impacts

Under the Proposed Action at the 125 FW installation, there would not be an increased risk of hazardous waste releases or exposure. Any LBP or ACM that may be found in buildings that are proposed for construction activities would be managed per applicable USAF regulations, and the installation's asbestos and LBP management plans. One ERP site, Site 4, overlaps with the proposed construction under this alternative but the site is closed and does not pose a threat to human health or the environment. However, the proposed construction is adjacent to two UST sites (UST 16 and UST 23/24) recommended for remedial action, one AOC (Hush House AOC-2 and AOC-3), and five PFOS/PFOA potential release areas (Hangar 1001, Hangar 1029, Old Fire Station #1, Old Fire Station #2, and Current Fire Station). It is recommended that direct contact with groundwater and soil be limited during all construction adjacent to the two UST sites, one AOC, and five PFOS/PFOA potential release areas. The 125 FW will comply with Air Force Guidance Memorandum (AFGM2019-32-01) *AFFF-Related Waste Management Guidance* to manage waste streams containing PFOS/PFOA (USAF 2019). Impacts relative to hazardous materials and wastes would not be significant.

If additional contaminated media were encountered during the course of site preparation or site development, work would cease until the 125 FW environmental manager establishes an appropriate course of action for the construction project to ensure that applicable federal and state agency notification requirements are met. Impacts relative to hazardous materials and wastes would not be significant.

FL4.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

According to CEQ regulations, the cumulative effects analysis of an EIS 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 timeframe. The effects may then be incremental and may result in cumulative impacts. Actions overlapping with or in close proximity to the Proposed Action or alternatives 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 in the same timeframe tend to offer a higher potential for cumulative effects.

This EIS addresses cumulative impacts to assess the incremental contribution of the alternatives to impacts on affected resources from all factors. The ANG has made an effort to identify actions on or near the affected areas that are under consideration and in the planning stage at this time. These actions are included in the cumulative effects analysis, drawn from the level of detail that exists now. Although the level of detail available for those future actions varies, this approach provides the decision-maker with the most current information to evaluate the consequences of the Proposed Action alternatives.

FL4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

In this section, an effort was made to identify past and present actions in the region and those reasonably foreseeable actions that are in the planning phase at this time. Actions that have a potential to interact with the Proposed Action at the 125 FW installation are included in this cumulative analysis. This approach enables decision-makers to have the most current information available so that they can evaluate the environmental consequences of the beddown of the F-35A aircraft at the 125 FW installation and training in associated SUA.

The 125 FW is an active military installation that undergoes changes in mission and in training requirements in response to defense policies, current threats, and tactical and technological advances. The installation, like any other major institution (e.g., university, industrial complex), requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs. In addition, tenant organizations may occupy portions of the installation, conduct aircraft operations, and maintain facilities. All of these actions (i.e., mission changes, facility improvements, and tenant use) will continue regardless of which alternative is selected.

The projects associated with this Proposed Action Alternative would have cumulative impacts on resources within the ROI and/or overlap in time; they are listed in Table FL4.1-1. Other ongoing maintenance and repair activities would occur within the same footprint as current activities (i.e., repairing existing infrastructure and interior modifications) and would not introduce any newly disturbed or impervious surfaces and are, therefore, not included herein.

Year	Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)	
Load Training Shelter				
2020	Demolition of B1043, Load Training Shelter.	6,400	0	
Commercial Vehicle Inspection Area				
2020	Construction of new foundation, truck lane, turn around area, and truck canopy to comply with AT/FP requirements.	42,200	11,800	
Security Forces Building				
2021	Internal renovations to B1054 to include replacing the HVAC system, replacing doors, and extending selective walls.	0	0	
Communications Squadron Building				
2021	Internal renovations to B1050 to include replacing the HVAC system, replace equipment damaged by lightning, and repair vapor partition.	0	0	
Vault Area and Parachute Tower				
2020-2021	Exterior renovations to B1005 to repair damage caused by Hurricane Irma.	0	0	
Small Arms Range				
2019	Construction of a new small arms range.	12,300	12,300	
Munitions Load Crew Training Facility				
2027	Construction of a new 8,300 SF munitions load crew training facility west of B1022.	8,300	0	
Munitions Storage Complex				
2027	Construction of a new 7,900 SF munitions storage complex and 6,100 SF of new roads northeast of the MSA area.	14,000	14,000	
Logistics Readiness Squadron B1006 Benairs				
2020	Interior and exterior renovations to B1006.	2,000	2,000	

Table FL4.1-1. Current and Reasonably Foreseeable Actions at 125 FW Installation (Page 1 of 3)

Table FL4.1-1.	Current and Reasonably F	oreseeable Actions
	at 125 FW Installation	
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Year	Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Widen M-1 Taxiway			
2020	Approximately 1,000 LF of existing taxiway would be expanded from 50 feet wide to 75 feet wide by adding asphalt to both sides.	51,200	51,200
Corrosion Control Clean Room			
2020	This project would include a 1,400 SF addition to the east side of B1049 for a clean room with lockers and showers to support the existing F-15 mission. In addition, interior renovations to B1049 would include adding a fire suppression system, fire detection, and floor repair.	1,400	1,400
Medical B1003	· · · ·		
2020	B1003 has mold and personnel are temporary utilizing trailers. Under this option, B1003 would be demolished and rebuilt in place. A new roof would be added to B1002 and B1004 since these buildings are connected to B1003.	11,400	0
Medical Detachment			•
2019-2020	Interior renovations of B1044 and B1045 to provide space for the Medical Detachment personnel that are moving to the installation. B1045 is currently the fire station and B1044 is the administrative offices for the fire station.	0	0
Repavement of Parking Lots			
2020	Four parking lots on the installation would be re- striped and/or repayed due to normal wear and tear.	318,600	0
Headquarters B1002			
2022	Interior renovation to B1002 to modernize the space for the current mission and add a sprinkler system.	0	0
Relocation of MOGAS Fuel Tanks and Pump Station			
2020	This project would include the relocation of three double walled fuel tanks and pumps to the north of B1053 and the construction of the new canopy.	2,000	0
LOX Storage			
2020	Maintenance of the exterior of B1407 (LOX storage) is needed. The exterior would be encapsulated, sandblasted, and repainted.	0	0

Table FL4.1-1. Current and Reasonably Foreseeable Actions at 125 FW Installation (Page 3 of 3)

Year	Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Dumpster Fencing and Pad			
2020	A 1,000 SF concrete pad would be installed north of B1052 for the addition of a large dumpster in the Camp Kong area.	1,000	1,000

Legend: AT/FP = Anti-terrorism/Force Protection; HVAC = heating, ventilation, and air conditioning; LOX = liquid oxygen; MOGAS = Motor Gasoline; MSA = Munitions Storage Area; SF = square foot/feet.

In addition to ANG construction projects on the installation, projects listed in Table FL4.1-2 could interact with the beddown of the F-35A at Jacksonville IAP.

Proponent	Project Name	Anticipated Year for Implementation
Florida Department of Transportation	Interchange improvements at Interstate 95 and Airport Road, including a new traffic light.	NA
Airport	Rehabilitation of terminal roofs.	2018-2021
Airport	Rehabilitation and extension of Taxiway F.	2019-2020
Airport	Installation of airfield wildlife fence and irrigation system.	2018
Airport	Construction of a consolidated rental car facility.	2018-2019
Airport	Construction of Concourse AB Connector and Air Traffic Control Tower substructure.	2020-2021
Integra River Run Apartments	Integra River Run Apartments on northeast corner of Owens Road and Max Leggett Parkway.	2018
River City Rehabilitation Center	Development of River City Rehabilitation Center on a 9.8-acre parcel at Owens Road and Max Leggett Parkway.	2017
University of Florida	University of Florida Health North Patient Pavilion, 160,000 SF near Owens Road and Max Leggett Parkway.	2017
Amazon	Amazon Fulfillment Center at Interstate-295 and Duval Road on 155 acres.	April 2018
Bronxton Bay Apartments	Construction of a 324-unit apartment complex situated on 40 acres between Broxton Bay Drive and Cole Road.	May 2018

Table FL4.1-2. Past, Present, and Reasonably Foreseeable Actions

FL4.2 ANALYSIS OF CUMULATIVE EFFECTS

The following analysis considers how the impacts of these other actions might affect or be affected by those resulting from the Proposed Action at the 125 FW installation and whether such a relationship would result in potentially additive impacts. Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources, quantifiable data are not available and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made based on an understanding of the nature of the project regarding cumulative impacts related to this EIS.

Past implementation of force structure changes at the 125 FW are integrated into the affected environment and analyzed under the No Action Alternative. Additionally, all aircraft operations are incorporated and analyzed in the relevant resource categories. No other airspace actions were identified that would interact with the Proposed Action at the 125 FW installation.

FL4.2.1 Noise

Under the Proposed Action at the 125 FW, 688 fewer acres would be exposed to noise levels equal to or greater than 65 dB DNL noise contours when compared to the No Action Alternative. When this action is considered with the projects listed in Table FL4.1-1, and in the list of non-installation-related projects, it is anticipated that any cumulative noise effects that are created would not be significant. All of the non-installation projects are short-term construction projects and would occur in an industrial setting. Noise associated with the construction projects would not affect sensitive receptors, disturb sleep, interrupt speech, or cause classroom disruptions in the long term. Noise from implementation of these actions would be short-term and localized, and would not be expected to increase the overall DNL noise contours. Refer to Section FL4.2.5 for discussion of land use compatibilities. Cumulative impacts that are anticipated when considered with the Proposed Action for the 125 FW installation would not be significant.

FL4.2.2 Airspace

No airspace projects (e.g., modifications or operational changes) were identified that would have the potential to interact with the Proposed Action at the 125 FW installation; therefore, no significant cumulative airspace impacts would be anticipated.

FL4.2.3 Air Quality

Based on the ACAM calculations, the criteria pollutant emissions associated with construction activities described in Table FL4.1-1 would not be significant. All of the criteria pollutant emissions are below the comparative indicator values. Based on the available information on these projects, and in combination with the decrease in annual criteria pollutant emissions from the proposed F-35A beddown, it is unlikely that significant impacts to air quality, such as violation of a NAAQS, would result. It is more likely that the overall level of criteria pollutant emissions would increase temporarily during construction periods, but at a level that would generate few, if any, impacts.

GHG emissions would slightly decrease due to implementing the F-35A beddown, as identified in FL3.3.1.2. All of the projects listed in Table FL4.1-1 and in the bulleted text would generate

GHGs and involve construction, which is of temporary duration. Some long-term benefits may offset the GHGs emitted during construction (for example, energy-efficient buildings). While quantification of GHG emissions for all of these projects is not possible, it can generally be assumed that an overall small decrease in GHG emissions, compared to the current levels, would occur, primarily as a result of the beddown, which would be an ongoing activity compared to construction projects that have limited timeframes.

Climate change, by definition, is a cumulative impact that results from the incremental addition of GHG emissions from millions of individual sources that collectively have a large impact on a global scale. Impacts of climate change on the region will include storm events of increasing frequency and severity involving flood and wind damage, which could produce negative impacts on mission activities and installation infrastructure.

FL4.2.4 Safety

Risk of a catastrophic event occurring during construction activities under this alternative or those activities described in Table FL4.1-1 is considered low, and strict adherence to all applicable occupational safety requirements further minimize the relatively low risk associated with described construction activities. Providing new and renovated facilities for the 125 FW installation that support operational requirements of the F-35A, and are properly sited with adequate space and a modernized supporting infrastructure would generally enhance ground and flight safety during required operations, training, maintenance and support procedures, security functions, and other activities conducted by the 125 FW installation. Proposed renovation and infrastructure improvement projects listed in Table FL4.1-1 would not impact aircraft take-offs and landings or penetrate any RPZs. New building construction is not proposed within RPZs; therefore, construction activity would not result in any greater safety risk or obstructions to navigation. While there are a few planned construction projects within the proposed QD arcs, per Air Force Manual 91-201, Explosive Safety Standards, all PTRDs and IBDs meet specified NEWQD criteria. No explosives would be handled during construction or demolition activities. Therefore, no additional risk would be expected as a result of implementation of this alternative. AT/FP have also been addressed in all facility construction projects. The fire and crash response capability currently provided by the 125 FW installation is sufficient to meet all requirements. Cumulative impacts to ground or flight safety would not be significant at the airfield. Within the SUA, ANG and FAA positive control and management would continue to ensure safe operations within the airspace. Repairs and construction projects identified in Table FL4.1-1 would be beneficial to safety; therefore, implementation of the Proposed Action at the 125 FW installation would result in no significant cumulative effects when considered with past, present, and reasonably foreseeable future actions.

FL4.2.5 Land Use

As mentioned in Section FL4.2.1, the majority of construction projects are inside the 125 FW installation boundaries and would introduce short-term noise increases; however, these would not generate noise levels to cumulatively affect the noise contours or change land use compatibilities. Operationally, the noise contours associated with the Proposed Action at the 125 FW installation would decrease by approximately 688 acres of off-installation property experiencing noise levels at or above 65 dB DNL. In general, land uses surrounding Jacksonville IAP would not be significantly impacted by the activities described under the Proposed Action Alternative in concert with those described in Table FL4.1-1. In summary, the Proposed Action at the 125 FW installation, when considered with present and reasonably foreseeable actions, would result in no significant cumulative land use impacts.

FL4.2.6 Socioeconomics

Economic activity associated with proposed construction activities described as a component of this alternative and those shown in Table FL4.1-1, such as employment and materials purchasing, would provide short-term economic benefits to the local economy. Additionally, there would be a permanent increase in up to 85 personnel positions. However, short-term cumulative beneficial impacts resulting from construction payrolls and materials purchased as a result of implementation of the Proposed Action at the 125 FW installation and those projects listed in Table FL4.1-1 would not be significant on a regional scale.

FL4.2.7 Environmental Justice and the Protection of Children

Under the Proposed Action at the 125 FW installation, when considered with projects listed in Table FL4.1-1, no residential populations, including minority and low-income populations or children, would be located within the 65 dB DNL noise contour in the vicinity of the airport. No other projects listed in Table FL4.1-1 would be expected to impact environmental justice communities or children. Therefore, no significant cumulative impacts to the health or safety of environmental justice populations or children are anticipated under the Proposed Action at the 125 FW installation.

FL4.2.8 Infrastructure

For purposes of this analysis infrastructure includes potable, waste, and stormwater; electrical and natural gas systems; solid waste management; and transportation. Under the Proposed Action at the 125 FW installation, short- and long-term demand for all services would increase by a minor degree when considered regionally. The Proposed Action and other projects would increase demand for potable water, increase production of wastewater, and create more impervious surfaces to increase stormwater runoff. However, cumulative effects would not be significant because there

is current and long-term capacity to meet increased demand for drinking water and disposal of wastewater. For stormwater, BMPs such as silt fencing, vegetation management, and ditching would minimize erosion and sedimentation during the short-term construction phases; retention and detention pond systems would avoid excessive runoff due to increases in impervious surfaces in the long term.

Demand for electricity and natural gas would be expected to increase in the short-term due to construction activities and in the long term due to increases in personnel. In the short-term, existing energy systems have the ability to meet increased demand. In the long term, there is capacity to meet the demands of the minor increase in personnel at the installation. It is assumed that the other projects built at the airport and in the adjacent community would draw from the existing labor pool and would not appreciably increase electricity and natural gas demand. Further, any new facilities and additions associated with the federal projects would incorporate Leadership in Energy and Environmental Design and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation when compared to facilities currently in place.

Under the Proposed Action at the 125 FW installation, it is anticipated that there would be both short- and long-term increases in solid waste generation. During demolition and construction phases, all materials would be disposed in permitted facilities, which have the capacity to accept these materials. In the long term, solid waste generated by the regionally minor increase in personnel could be handled by existing solid waste management systems.

In terms of transportation, the local traffic network has the ability to meet the short-term increases in traffic during construction activities. In the long term, the transportation network would be able to meet the needs of the minor increase in personnel. In summary, cumulative impacts to infrastructure due to the Proposed Action at the 125 FW installation and reasonably foreseeable future projects are expected to not be significant.

FL4.2.9 Earth Resources

Total acreage disturbed by the F-35A beddown would be up to 468,492 SF (10.8 acres) of new construction footprint, including up to 81,600 SF (1.9 acres) new impervious surface such as roofs and paved areas. New construction associated with projects listed in Table FL4.1-1 would result in up to 470,800 SF (10.8 acres) of new construction footprint and up to 93,700 SF (2.2 acres) of new impervious surface. All proposed construction is within the footprint of the developed installation. As such, no impact to geology or topography are expected under the Proposed Action at the 125 FW installation.

The CWA considers stormwater from a construction site as a point source of pollution regulated by the NPDES permit. Therefore, those projects described in Table FL4.1-1 larger than 1 acre are required to have a site-specific and detailed SWPPP that coordinates the timing of soil disturbing activities with the installation of soil erosion and runoff controls in an effort to reduce the impacts to the local watershed; this is an effective way of controlling erosion while soil is exposed and subject to construction activity. Implementation of standard construction practices would be used to limit or eliminate soil movement, stabilize erosion, and control sedimentation. These standard construction practices would include the use of: velocity dissipation devices, well-maintained silt fences; minimizing surficial area disturbed, stabilization of cut/fill slopes, minimization of earthmoving activities during wet weather, and use of temporary detention ponds. Following construction, disturbed areas not covered with impervious surfaces would be reestablished with appropriate vegetation and managed to minimize future erosion potential. Given the use of engineering practices that would minimize potential erosion, cumulative impacts to earth resources would be expected to be minor.

The Farmland Protection Policy Act is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. However, none of the projects (neither the Proposed Action at the 125 FW installation nor the present/reasonably foreseeable projects) are proposed on lands subject to the Farmland Protection Policy Act. In summary, implementing the Proposed Action at Jacksonville, along with other anticipated projects, would not result in significant cumulative impacts to earth resources.

FL4.2.10 Water Resources

Surface Water. Those projects that exceed 1 acre in size under the Proposed Action at the 125 FW installation or other projects, would require coverage under Florida's Construction General Permit. In compliance with coverage under this permit, a Construction BMP Plan (CBMPP) would be implemented and prepared to maintain effective erosion and sediment controls. The CBMPP includes the erosion, sediment, and pollution controls used, identifies periodic compliance inspections, and prescribes maintenance measures for the controls identified, throughout the life of the construction projects. Through compliance with Florida's Construction General Permit, cumulative effects would not be significant when considering the Proposed Action at the 125 FW installation and other projects listed in Table FL4.1-1.

Groundwater. Construction and demolition impacts to groundwater under the Proposed Action at the 125 FW installation, when considered with present and reasonably foreseeable projects, would not extend below ground surface to a depth that would affect the underlying aquifer. Although fuel or other chemicals could be spilled during construction, demolition, and renovation activities, implementation of the required Spill Prevention Control and Countermeasures Plan and immediate cleanup of any spills would prevent any infiltration into groundwater resources. Therefore,

cumulative impacts to groundwater resources would not be significant under the Proposed Action at the 125 FW installation.

Stormwater. Construction and demolition activities associated with the Proposed Action at the 125 FW installation, when considered with present and reasonably foreseeable projects, would result in a temporary, cumulative increase in surface water turbidity; however, BMPs associated with the SWPPP are designed to minimize these impacts. These BMPs include practices such as wetting of soils and silt fence installation, as well as adherence to federal and state erosion and stormwater management practices, to contain soil and runoff on the project areas. All other present and foreseeable projects would be required to follow the same state and federal guidelines for construction permitting to ensure water quality was protected from possible erosion and sedimentation. This includes implementing project-specific BMPs to minimize impacts to water quality and using stormwater engineering controls (e.g., stormwater runoff control systems directing water off the developed areas) to decrease future impacts to water quality following construction. The use of spill prevention plans and SWPPPs during construction would minimize impacts to water quality.

Additionally, in accordance with UFC 3-210-10, *Low Impact Development* (as amended, 2016) and EISA Section 438, any temporary increase in surface water runoff as a result of the proposed construction is required to be attenuated through the use of temporary and/or permanent drainage management features. Under these requirements, federal facility projects with over 5,000 SF of new impervious surface must maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. This would apply to several of the construction projects proposed under this alternative and as such would minimize impacts to stormwater runoff. Cumulative impacts to stormwater would not be significant.

Floodplains. Several of the Proposed Action Alternative projects, and potentially some of the projects that are reasonably foreseeable inside the airport boundaries, would occur within the 100-year floodplain. This would result in cumulative impacts to the floodplain. Where the only practicable alternative is to site in a floodplain, a planning process is followed to ensure compliance with Executive Order (EO) 11988. For federal facility construction, as discussed under surface water, predevelopment hydrology would be maintained through compliance with LID and EISA and there would no substantial increase in stormwater runoff. Cumulatively, there is a potential to impact floodplains when the Proposed Action at the 125 FW installation is considered along with present and reasonably foreseeable projects; however, the Proposed Action Alternative by itself would not significantly impact floodplains.

Wetlands. Compensatory mitigation and federal permitting and state water quality certification in accordance with Sections 401 and 404 of the CWA would be necessary for any future construction

activities affecting wetlands. State of Florida permitting under Chapter 62-330, Florida Administrative Code, known as the Statewide Environmental Resource Permit Rule, would also be necessary for any future construction activities affecting these wetlands. The new MSA Administration Building project in Table FL4.1-1 would impact approximately 0.2 acre of forested wetlands. Since the proposed projects involve construction in a wetland, a Finding of No Practicable Alternative would be required. Compensatory mitigation would minimize cumulative impacts to wetlands, including present and reasonably foreseeable projects. Therefore, cumulative impacts would not be significant.

FL4.2.11 Biological Resources

Noise levels would be expected to increase from current levels with the conversion to the F-35A aircraft. However, these noise levels from operations and construction are not expected to impact wildlife in the area because they are likely accustomed to elevated noise levels associated with current commercial aircraft and military operations. The opportunity for bird aircraft strikes to occur, including those with migratory birds, would remain the same as current levels. No threatened and endangered or special status species are currently known to reside on 125 FW installation or within the land area under the projected noise contours. The only state listed species observed on the installation are the blue flower butterwort and the hooded pitcher plant. However, construction listed in Table FL4.1-1 would avoid disturbance to these plant populations. Construction-related impacts to the vegetation at the 125 FW installation and in the vicinity of projects identified in Table FL4.1-1 would be minor due to the lack of sensitive vegetation in the project areas. In general, construction activities at the 125 FW installation and at the Jacksonville IAP would primarily occur on sites that are already highly altered. These impacts would include the removal of some vegetation and associated wildlife habitat. However, wildlife that uses these areas is typical of urban and suburban areas. No impacts to any federally- or state-threatened, endangered, or special status species is expected as a result of the Proposed Action at the 125 FW installation; therefore, cumulative impacts to biological resources would not be significant.

FL4.2.12 Cultural Resources

The areas of proposed construction are considered to have no to low probability of containing archaeological resources. In the event of an inadvertent discovery during ground-disturbing operations, work would cease immediately, the area would be secured, and the environmental manager would be contacted. The environmental manager would follow ANG Inadvertent Discovery protocol. None of the facilities listed for renovation and/or modification under the Proposed Action at the 125 FW or those listed in Table FL4.1-1 are eligible for listing in the NRHP. No traditional cultural resources have been identified on the installation or in areas proposed for present and future development. Therefore, cumulative impacts to cultural resources would not be significant under the Proposed Action at the 125 FW installation.
FL4.2.13 Hazardous Materials and Wastes, and Other Contaminants

The types of hazardous materials needed for maintenance and operation of the F-35A would be expected to remain similar to those currently used for maintenance and operation of the F-15C fleet. Under this alternative, the total number of airfield operations would increase approximately 1 percent; therefore, throughput of petroleum substances and hazardous waste streams would be expected to increase. However, it is expected that short-term increases in the quantity of fuel used during construction activities for this action and the present/reasonably foreseeable project would occur. Hazardous waste generation (e.g., used oil, used filters, oily rags, etc.) would continue to be managed in accordance with the installation's Hazardous Waste Management Plan and all applicable federal, state, and local regulations. The pollution prevention detailed in the Hazardous Waste Management Plan would be continued and would include any construction-related materials or wastes associated with aircraft operations. Additionally, no changes to the installation's SQG status would be expected to occur due to the no net change in hazardous waste generation from aircraft operations. Any structures proposed for demolition, addition, or retrofit would be inspected for ACM and LBP according to established procedures prior to any renovation or demolition activities. Cumulative impacts as a result of the Proposed Action at the 125 FW installation and present/reasonably foreseeable projects would not be significant.

FL4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA CEQ regulations require environmental analyses under an EIS to identify "...any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented" (40 CFR Section 1502.16). Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe. Building construction material such as gravel and gasoline usage for construction equipment would constitute the consumption of nonrenewable resources. Irretrievable resource commitments also involve the loss in value of an affected resource that cannot be restored as a result of the action.

Training operations would involve consumption of nonrenewable resources, such as gasoline used in vehicles and jet fuel used in aircraft. Use of training ordnance would involve commitment of chemicals and other materials. None of these activities would be expected to substantially affect environmental resources, because the relative consumption of these materials is expected to change negligibly.

The primary irretrievable impacts of implementation of the Proposed Action at the 125 FW installation or for any of the alternatives would involve the use of energy, labor, materials and

funds, and the conversion of some lands from an undeveloped condition through the construction of buildings and facilities on the installation. Irretrievable impacts would occur as a result of construction, facility operation, and maintenance activities. Direct losses of biological productivity and the use of natural resources from these impacts would be inconsequential.

127 WG - SELFRIDGE ANGB, MI



MI1.0 127TH WING INSTALLATION OVERVIEW

This section presents an overview of the 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan; the specifics of the Proposed Action as it relates to both the airfield and the associated airspace; construction and facility modifications required at the installation; and changes to personnel that would result if the F-35A was beddown at the 127 WG installation.

The 127 WG of the Michigan Air National Guard (MIANG) is located at Selfridge ANGB in Harrison Township, Macomb County, Michigan, approximately 20 miles north of Detroit, Michigan on the shore of Lake St. Clair (Figure MI1.0-1). Selfridge ANGB occupies approximately 3,075 acres and is a Joint Military Community with more than 40 tenants, including the Army, United States (U.S.) Air Force (USAF), Marines, Navy, Coast Guard, U.S. Border Patrol, and the Department of Homeland Security. The 127 WG is the host unit at Selfridge ANGB.

The 127 WG's federal mission is to provide trained, equipped, and motivated airlift, fighter, combat weather, and support resources serving the community, state, and nation. The 127 WG also maintains a state mission of protecting life and property and preserving peace, order, and public safety. These missions are accomplished through emergency relief support during natural disasters such as floods, earthquakes and forest fires; search and rescue operations; support to civil defense authorities; maintenance of vital public services and counterdrug operations (Selfridge ANGB 2017). The 127 WG supports two USAF major commands—Air Combat Command (ACC) and Air Mobility Command (AMC)—flying two distinctly different missions in the A-10 Thunderbolt II, a close air support aircraft and KC-135 Stratotanker, an aerial refueler with global reach.

In the sections that follow, MI2.0 presents the installation-specific description of the Proposed Action at the 127 WG installation. Section MI3.0 addresses the affected environment and environmental consequences that could result if the 127 WG installation was selected as one of the F-35A beddown locations. Refer to Chapter 3 for a complete and detailed definition of resources and the methodology applied to identify potential impacts. Section MI4.0 identifies other, unrelated past, present, and reasonably foreseeable future actions in the affected environment and evaluates whether these actions would cause cumulatively significant effects when considered along with the F-35A beddown actions. This section also represents the irreversible and irretrievable resources that would be committed if the beddown was implemented at the 127 WG installation.



MI2.0 127TH WING ALTERNATIVE

MI2.1 127TH WING INSTALLATION

There are four components of this action at the 127 WG installation: (1) conversion from A-10s to F-35As, (2) operations conducted by F-35A aircraft, (3) construction and modification projects to support beddown of the F-35A, and (4) personnel changes to meet F-35A requirements. Each is explained in more detail below.

MI2.1.1 Aircraft Conversion

Under this alternative, 18 F-35A aircraft would be based at the 127 WG installation and replace the 18 A-10s currently based there. The beddown would begin in 2023 with delivery of the first F-35A aircraft, and would be complete by 2024 when the full complement of 18 F-35As would be at the base. Drawdown of the 127 WG's A-10s would be complete approximately 6 months before the arrival of the F-35A.

MI2.1.2 Airfield Operations

The 127 WG is an integral component of the Combat Air Forces (CAF). The CAF defends the homeland of the U.S. as well as deploys forces worldwide to meet threats to ensure the security of the U.S. To fulfill this role, the A-10 pilots of the 127 WG must train as they would fight.

The USAF anticipates that by 2024, all 18 F-35A aircraft would be flying up to 6,746 operations per year at Selfridge ANGB, compared to the 5,098 annual operations currently flown with the A-10s (Table MI2.1-1). In total, Selfridge ANGB supports 21,612 operations annually. Based on proposed requirements and deployment patterns under CAF, the F-35A operational aircraft would fly some operations during deployments at other locations for exercises, or in preparation for deployments. During such periods, home station flying operations would be reduced accordingly. Some of the home station missions could involve inert ordnance delivery training (within the scope of existing National Environmental Policy Act [NEPA] documentation) at approved ranges.

	Total Current Operations	Proposed F-35A Operations
Based A-10s	5,098	-
Proposed F-35A	-	6,746
Other Aircraft	16,514	16,514
Total Airfield Operations	21,612	23,260
Percent Change at Airfield	N/A	8%

Table MI2.1-1. Current and Proposed Annual Airfield Operations at Selfridge ANGB

Under this alternative, total 127 WG annual airfield operations with the F-35A, as opposed to the A-10s, would increase from 5,098 to 6,746, or 32 percent. This change would represent only an 8 percent increase in total aircraft operations at the airfield.

The F-35As would employ the same departure and landing flight tracks as currently used by the A-10s of the 127 WG. The F-35A profiles would be slightly different based on aircraft performance. The 127 WG A-10s currently do not use afterburner at Selfridge ANGB, as the A-10 is not equipped with an afterburner. The National Guard Bureau (NGB) anticipates that the F-35A may use afterburner for take-offs no more than 5 percent of the time. F-35A operations would adhere to existing restrictions, avoidance procedures, and the quiet-hours program (or what is termed course rules) at Selfridge ANGB. The A-10s at Selfridge ANGB currently fly less than 1 percent of the time (51 operations annually) between the hours of 10 p.m. and 7 a.m. (environmental night), with the majority of the operations after 10 p.m. being associated with arrivals back to the installation. In addition, overseas deployment departures may occur during environmental night, but would be infrequent. The 127 WG would plan to fly a schedule similar to what they currently do with regard to environmental night flights, although contingencies such as weather or special combat mission training may result in rare unplanned operations during this period. Typically, all required "after dark" operations could be achieved prior to 10 p.m.

MI2.1.3 Construction

To support the proposed F-35A operations, additional infrastructure and facilities would be required at the 127 WG installation. Fourteen infrastructure improvement projects would be needed to support the F-35A beddown. Some of these construction projects also have several options that could be implemented. Table MI2.1-2 describes these projects, the total affected area in square feet (SF), and new impervious surfaces introduced. Figure MI2.1-1 identifies the construction locations for each project within the installation. It is anticipated that construction would occur between 2020 and 2023.

Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Project #1 (Option 1) – Flight Simulator		
Construct a new 19,000 SF new facility west of B171. Demolish B171.	19,000	19,000
Project #1 (Option 2) – Flight Simulator		
Add 15,000 SF to B34 and interior modifications to accommodate room for the F-35A flight simulator.	15,000	15,000
Project #1 (Option 3) – Flight Simulator		
Conduct interior renovations in B117 to accommodate room for the F-35A flight simulator. This Option can only be chosen if both Project #2 (Option 1) and Project #14 (Option 1) are not selected.	0	0
Project #2 (Option 1) – Engine Shop		
Conduct interior renovations in B117 for an engine shop. This Option can only be chosen if both Project #1 (Option 3) and Project #14 (Option 1) are not selected.	0	0
Project #2 (Option 2) – Engine Shop		
If Option 3 for the flight simulator is chosen, then add 7,000 SF to B3 for an engine shop	7,000	7,000
Project #3 – Aircraft Shelters		
Enclose the existing aircraft shelters.	0	0
Project #4 – Maintenance Hangar		
Conduct interior renovations in Maintenance Hangar B3 to upgrade the hangar to F-35A requirements.	0	0
Project #5 – Maintenance Hangar		
Conduct interior renovations in Maintenance Hangar B5 to upgrade the hangar to F-35A requirements.	0	0
Project #6 – Squadron Operations, ALIS, and APO		
Conduct interior renovations in B34 for squadron operations, ALIS, and APO.	0	0
Project #7 – General Purpose Shops		
Conduct internal renovations in B120 for General Purpose Shops to fulfill new F-35A requirements.	0	0
Project #8 – Fuel Cell/Corrosion Control		
Conduct internal renovations in B154 for Fuel Cell/Corrosion Control Shop functions to fulfill new F-35A requirements.	0	0
Project #9 – BAK 12/14 Aircraft Arresting System		
Addition of a BAK 12/14 arresting system to primary runway *	0	0
Project #10 (Option 1) – Maintenance Shop and MxG		
Conduct interior renovations and external repairs to walls of B18 to meet F-35A requirements	0	0
Project #10 (Option 2) – Maintenance Shop and MxG		
Demolish B18 and construct new 31 000 SF Hangar in its place to meet		
F-35A requirements.	31,000	8,400
Project #11 - Command and Control		
functions that come with the new F-35A mission.	0	0
Project #12 – AGE		
This project includes a 4,500 SF addition to Hangar 3 for AGE facilities required for the F-35A, and would only occur if Project #2, Option 2, is not chosen.	4,500	0

Table MI2.1-2. Proposed Construction and Modifications for the 127 WG Installation(Page 1 of 2)

Table MI2.1-2.	Proposed Construction and Modifications for the 127 WG Installation
	(Page 2 of 2)

Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Project #13 – Weapons Loading Training	-	-
This project includes the construction of an 11,500 SF weapons loading training facility west of B154. In addition, 25,000 SF of pavement would be added south of the new building.	36,500	25,000
Project #14 (Option 1) – Distributed Spares		
Interior renovation of B117 to accommodate distributed spares. This option can only be selected if both Project #1 (Option 3) and Project #2 (Option 1) are not chosen.	0	0
Project #14 (Option 2) – Distributed Spares		
Construct a 6,000 SF addition to B103.	6,000	0

Note: * = Not shown on map.

Legend: AGE = Aerospace Ground Equipment; ALIS = Autonomic Logistics Information System; APO = Aircraft Propulsion Operations; BAK = Barrier Arresting Kit; MxG = Maintenance Group; SF = square feet.



Figure MI2.1-1. 127 WG Installation Construction and Modifications

MI2.1.4 Personnel

The 127 WG supports 339 federal technician civilian employees, 135 Air Guard Reserve (AGR), and 939 traditional guardsmen (MIANG 2017a). In total, nearly than 3,000 full-time civilian and military personnel work at the base, in addition to approximately 3,000 members of the Air and Army National Guard and the Reserve components of the U.S. Armed Forces (Selfridge ANGB 2017). It is expected that the overall number of Air National Guard (ANG) personnel at the 127 WG installation at Selfridge ANGB would remain effectively static following conversion to the F-35A. There may be some retraining that occurs, but overall, the number of ANG personnel would be expected to remain approximately the same as it currently is at Selfridge ANGB. However, as a component of this proposal, a USAF Active Duty Associate Unit would be installed at the two selected alternatives, which would be comprised of up to 5 pilots, 40 maintenance staff, and approximately 5 other support staff. For more information on the USAF Active Duty Associate Unit, see Section 2.2.1.4. In addition, up to approximately 35 new personnel would be added at each installation to provide security and contract oversight for Full Mission Simulator (FMS) and the Autonomic Logistics Information System (ALIS) (broken down approximately by 7 field service, 15 ALIS support, 10 training, and 3 security personnel).

MI2.2 127th Wing: Training Airspace and Ranges

The 127 WG uses several airspace units (Table MI2.2-1 and Figure MI2.2-1), including over land Military Operations Areas (MOAs), overlying Air Traffic Control Assigned Airspace (ATCAAs), and Restricted Areas. Section 2.2.2.1 provides definitions of these airspace units. The beddown action would not require changes in Special Use Airspace (SUA) attributes, volume, or proximity. The type of ordnance employed at the ranges is expected to remain the same or decrease.

Table 112.2 1: 127 VO Minuary Training Mispace				
Airspace	Floor (feet MSL) ¹	Ceiling (feet MSL) ¹		
Pike East MOA	300 feet AGL	To BNI 18,000		
Pike West MOA	6,000	To BNI 18,000		
Steelhead MOA	6,000	To BNI 18,000		
Steelhead ATCAA	18,000 feet MSL	To BNI 35,000		
R-4201 A	Surface	23,000		
R-4201 B	Surface	9,000		
R-4207	Surface	45,000		
Firebird ATCAA	18,000 feet MSL	35,000		
Garland ATCAA	18,000 feet MSL	27,000		
Grayling ATCAA	18,000 feet MSL	45,000		
Lumberjack ATCAA	18,000 feet MSL	35,000		
Molson ATCAA	18,000 feet MSL	35,000		

|--|

Notes: ¹MSL is the elevation (on the ground) or altitude (in the air) of an object, relative to the average sea level. The elevation of a mountain, for example, is marked by its highest point and is typically illustrated as a small circle on a topographic map with the MSL height shown in either feet or meters or both. Because aircraft fly across vast landscapes, where points above the ground can and do vary, MSL is used is denote the "plane" on which the floors and ceilings of SUA are established and the altitude at which aircraft must operate within that SUA.

Legend: AGL = above ground level; ATCAA = Air Traffic Control Assigned Airspace; BNI = but not including all MOAs extend to 18,000 feet MSL unless otherwise noted; MOA = Military Operations Area; MSL = mean sea level; R- = Restricted Area

Source: FAA 2017.

MI2.2.1 Airspace Use

As the replacement for fighter aircraft, the F-35As would conduct missions and training programs necessary to fulfill its multi-role responsibilities (refer to Chapter 2). All F-35A flight activities would take place in existing airspace, so no airspace modifications would be required. The NGB expects the F-35A would operate in the airspace currently used by the 127 WG, with approximately the same number of operations in each airspace unit, but may operate somewhat differently than the A-10 aircraft now using that airspace. These differences would derive from enhanced capabilities and different operating requirements for the F-35A.

Although the F-35As would perform missions similar to the A-10s, they represent a different aircraft with vastly different capabilities, and would fly somewhat differently. Pilots would adapt training activities, where necessary, to ensure their accomplishment within available airspace. No changes to airspace structure are anticipated. The differences in utilization of the existing airspace include use of higher altitudes overall, combined use of existing airspace, and generally higher altitudes for supersonic flights that occur. Because the A-10s do not conduct supersonic flights, the F-35As would introduce supersonic operations by the 127 WG. Military aircraft conduct supersonic operations only in the airspace authorized for such use.



The F-35A would be expected to fly more of the time at higher altitudes than the A-10s (Table MI2.2-2), operating more than 90 percent of the time above 10,000 feet mean sea level (MSL), compared to about 46 percent for the A-10. This would result in the F-35A aircraft conducting most of their operations in the ATCAAs and higher altitude regimes of the airspace. Regardless of the altitude structure and percent use indicated in Table MI2.2-2, F-35A aircraft (as do existing military aircraft) would adhere to all established floors and ceilings of airspace units.

Altitude (feet)	Percentage Use A-10 ¹ Air-to-Ground	Percentage Use F-35A Multi-role
500-2,000 AGL	15%	1%
2,000-5,000 AGL	12%	1%
5,000-10,000 AGL	28%	5%
10,000-18,000 MSL	29%	24%
18,000-30,000 MSL	17%	58%
>30.000 MSL	0%	11%

Table MI2.2-2. Approximate 127 WG Current and Proposed Altitude Distribution

Note: ¹Air-to-ground training mission.

Legend: AGL = above ground level; MSL = mean sea level.

Table MI2.2-3 presents current operations as of September 2016 in Selfridge ANGB training airspace. The information is broken down into total aircraft operations (includes aircraft operating out of Selfridge ANGB and other transient users) and then presents a subset of this information for the 127 WG aircraft. The F-35A proposed airspace operations are also presented and then comparisons made in net change and percent change in total aircraft operations.

Airspace Unit	Total All Aircraft Current Airspace Operations	A-10 Current Airspace Operations	Proposed Total All Aircraft Airspace Operations	Proposed F-35A Airspace Operations
Pike East MOA	262	28	879	645
Pike West MOA	754	384	1,068	2698
Steelhead MOA	899	568	964	2633
Steelhead ATCAA	693	371	976	654
R-4201A (Grayling Air-to-Ground Range)	1,373	1,102	675	404
R-4201B (Grayling Air-to-Ground Range)	120	110	26	16
Molson ATCAA	2	0	2	0
Firebird ATCAA	427	4	1,394	971
Garland ATCAA	419	89	913	583
Grayling ATCAA	49	0	582	533
Lumberjack ATCAA	432	4	1,411	983

Table MI2.2-3. 127 WG Current and Proposed Airspace Operations

Legend: ATCAA = Air Traffic Control Assigned Airspace; MOA = Military Operations Area; R- = Restricted Area.

Like the A-10 aircraft, the F-35A would fly approximately 90-minute long missions, including take-off, transit to and from the training airspace, training activities, and landing. The 127 WG A-10 aircraft currently conduct up to 2,400 annual sorties (or approximately 200 monthly sorties) lasting between 30-45 minutes in the airspace. Under the Proposed Action, the F-35A aircraft would conduct up to 3,061 annual sorties (approximately 250 monthly sorties) lasting 30-60 minutes. On occasion during an exercise, the F-35A may spend up to 90 minutes in one or more airspace units. Based on this, the time spent in the airspace by the 127 WG would increase by approximately 54 percent from the affected environment.

To train with the full capabilities of the aircraft, the F-35A would employ supersonic flight at altitudes and within airspace already authorized for such activities. Due to the F-35As mission and the aircraft's capabilities, the NGB anticipates that approximately 10 percent of the time spent in air combat training would involve supersonic flight. All supersonic flight would be conducted above 15,000 feet MSL, with 90 percent occurring above 30,000 feet MSL. Supersonic operations are not approved for use in the Alpena complex on a full-time basis. Supersonic activity is typically approved for a week once to twice per year.

MI2.2.2 Ordnance Use and Defensive Countermeasures

Most air-to-ground training would be simulated, where nothing is released from the aircraft, and target scoring is done electronically. As was discussed in Chapter 2, Section 2.2.2.7, however, the F-35A is capable of carrying and employing several types of air-to-air and air-to-ground ordnance (including strafing) and pilots would need training in their use. As the NGB currently envisions, the type of ordnance employed is expected to remain the same or decrease from that currently employed by fighter aircraft at the Grayling Air-to-Ground Range. F-35A pilots would only use ranges and airspace authorized for the type of ordnance being employed and within the number already approved at a range and/or target. If in the future the NGB identifies weapons systems that are either new or could exceed currently approved levels, appropriate NEPA documentation would need to occur prior to their employment.

Grayling Air-to-Ground Range (Restricted Area [R-] 4201A/B) contains varied target sets for supporting laser and air-to-ground weapons training. Live weapons are not permitted in the Grayling Air-to-Ground Range. It is expected that any live-fire training would be conducted during formal training exercises conducted remotely from Selfridge ANGB.

Like the A-10, the F-35A would employ chaff and flares as defensive countermeasures in training. Chaff and flares are the principal defensive mechanisms dispensed by military aircraft to avoid attack by enemy air defense systems. Use of chaff and flares are permitted in all airspace units identified in Table MI2.2-3 and proposed for use by the F-35A. Flares are not permitted to be released below 2,000 feet AGL over non-government-owned or -controlled property. For the

purposes of this analysis, it is estimated that F-35A chaff and flare expenditure would not exceed use by the legacy A-10s on a per operation basis for the 127 WG.

Based on the emphasis on flight at higher altitudes for the F-35A, roughly 90 percent of flare releases would occur above 15,000 feet MSL. At this altitude, most flares would be released more than seven times higher than the minimum release altitude permitted (2,000 feet AGL) over non-government-owned or -controlled property and ensure complete burnout before reaching the ground.

MI2.3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES AT THE 127 WG INSTALLATION

Analysis of affected environments provides a benchmark that enables decision-makers to evaluate the environmental consequences of the proposed beddown alternatives at each base. For each resource, this installation-specific section uses description of the affected environment and the evaluation of the No Action Alternative. Changes to the affected environment that are attributable to the Proposed Action are then examined for each resource. Thus, the change (increase or decrease) in the resource at each installation can be compared for all alternative locations.

MI2.4 PERMITS, AGENCY CONSULTATIONS, AND GOVERNMENT-TO-GOVERNMENT CONSULTATIONS

The 127 WG operates under agreements with a series of environmental permitting agencies for such resources as air, water, and cultural resources.

Permitting. The following section describes the permits that would be required to implement at this alternative location.

- Facilities that discharge stormwater from certain activities (including industrial activities, construction activities, and municipal stormwater collection systems) require Clean Water Act (CWA) Section 402 National Pollutant Discharge Elimination System (NPDES) permits.
 - For construction activities disturbing greater than 1 acre, the State of Michigan would require a Construction Stormwater General Permit. In addition, for projects greater than 1 acre or within 500 feet of the water's edge of any lake, stream, or drain, a Soil Erosion and Sedimentation Control permit must be obtained from Macomb County. At this point, the permitted activity will be deemed to have automatic stormwater coverage from the state (127 WG 2015a). A Construction Stormwater General Permit would be obtained prior to construction and this would require approval of a site-specific Stormwater Pollution Prevention Plan (SWPPP) and Notice of Intent (NOI). A

site-specific Spill Prevention, Control, and Countermeasures Plan would also be in place prior to the start of construction.

- The State of Michigan, through the Michigan Department of Environment, Great Lakes, and Energy (EGLE¹), Surface Water Division, issued a new individual stormwater permit for industrial discharges at Selfridge ANGB in July of 2011 (revised 2015; 127 WG 2015a). A SWPPP has been prepared to comply with the U.S. Environmental Protection Agency (USEPA) NPDES program. Associated with the permitting is the need to characterize the storm drainage areas, monitor the stormwater quality and implement best management practices (BMPs) to improve stormwater quality. The SWPPP also complies with Air Force Instruction (AFI) 32-7041, *Water Quality Compliance*. The existing SWPPP already in place (127 WG 2015a) for the base would be amended, as necessary, to reflect post-construction operations and potentially new BMPs.
- Federal projects with a footprint larger than 5,000 SF must maintain predevelopment hydrology and prevent any net increase in stormwater runoff as outlined in Unified Facilities Criteria (UFC) 3-210-10, *Low Impact Development*, and consistent with the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects* under Section 438 of the Energy Independence and Security Act (EISA) of 2007.
- As applicable, the 127 WG would coordinate with EGLE regarding proposed construction near Environmental Restoration Program (ERP) sites on the 127 WG installation.
- A conformity applicability determination is required for federal actions occurring in nonattainment or maintenance areas for criteria pollutants when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed *de minimis* thresholds. Selfridge ANGB is located in Macomb County, which is in nonattainment for the 2015 ozone standard, and maintenance for carbon monoxide (CO) and particulate matter less than or equal to 2.5 microns in diameter (PM_{2.5}). Therefore, a conformity applicability analysis is necessary to identify whether a formal conformity determination is required.
- Personnel conducting construction and/or demolition activities would strictly adhere to all applicable occupational safety requirements during construction activities.
- Sampling for asbestos-containing material (ACM) and lead-based paint (LBP) would occur prior to demolition or renovation activities for those buildings not previously tested; all materials would be handled in accordance with USAF policy. If ACM or LBP is present, the 127 WG would employ appropriately trained and licensed contractors to perform the ACM and/or LBP removal work and would notify the construction contractors of the

¹Agency name changed from Michigan Department of Environmental Quality by Executive Order 2019-02 effective 7 April 2019.

presence of ACM and/or LBP so that appropriate precautions could be taken to protect the health and safety of the workers.

Consultation. An initial consultation letter was sent to the Michigan State Historic Preservation Office (SHPO) in February 2018. Consultation will continue through the Environmental Impact Analysis Process (EIAP).

Government-to-Government. An initial phone call to Tribal offices to verify contact information and current Senior-level Tribal Officials before any materials were mailed to the American Indian Tribe was completed in late October/early November 2017. An initial government-to-government consultation letter was sent to 12 federally-recognized American Indian Tribes and 2 staterecognized American Indian Tribes with ancestral ties to the Selfridge ANGB and lands beneath the associated airspace in February 2018. These 12 federally-recognized American Indian Tribes included Grand Traverse Band of Ottawa and Chippewa Indians, Hannahville Potawatomi Indian Community, The Nottawaseppi Huron Band of Potawatomi, The Keweenaw Bay Indian Community, Lac Vieux Desert Band of Lake Superior Chippewa Indians, The Sault Ste. Marie Tribe of Chippewa Indians, The Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan, The Pokagon Band of Potawatomi Indians, Saginaw Chippewa Indian Tribe, Bay Mills Chippewa Indian Community. The two state-recognized American Indian Tribes included The Burt Lake Band of Ottawa and Chippewa and The Grand River Bands of Ottawa Indians. After the initial government-to-government consultation letter was sent, NGB followed up with telephone calls and emails in an effort to increase accessibility and encourage communication in the event an American Indian Tribe would have any concerns regarding the Proposed Action or land below the affected airspace areas. No American Indian reservations underlie the airspace associated with the Selfridge ANGB.

The Keweenaw Bay Indian Community provided a response via e-mail. To date, no other responses have been received from the federally- and state-recognized Tribes associated with Selfridge ANGB.

MI2.5 PUBLIC INVOLVEMENT / AGENCY CONCERNS

MI2.5.1 Scoping

A scoping meeting was held on February 21, 2018 in Clinton Township, Michigan. Nine people attended the scoping meeting and 12 comments were received from the public and agencies prior to close of the scoping period (1 agency, 1 Tribe, and 10 general public).

Most comments received at the meeting were in support of the F-35A beddown at Selfridge ANGB. Of the 10 general public comments, 8 were in support of the proposed beddown and 1 expressed concerns about noise.

MI2.5.2 Draft Environmental Impact Statement Public Comment Period

A Draft Environmental Impact Statement (EIS) public meeting was held on September 10, 2019 in Clinton Township, Michigan. There were 12 people that attended the meeting and 36 comments were received from the public and agencies with regard to the Proposed Action at Selfridge ANGB prior to close of the comment period. See Section 1.6 of the EIS for more details on the public involvement process. The following are the most prevalent comments received from the Michigan public on the Draft EIS. See Appendix A6 for a summary of responses to comments on the Draft EIS.

- 1) General support or opposition to the proposed beddown.
- 2) General complaints about noise.
- Disagreements about how noise is modeled, e.g., Day-Night Average Sound Level (DNL) is not "what one hears."
- 4) General concerns about Environmental Justice communities.
- 5) There was no obvious use of maximum sound level (L_{max}), while previous F-35A Beddown EIS's contained tables of L_{max}.
- 6) Concern about increased noise causing health concerns.
- 7) Suggestions to identify less urban areas for the F-35A aircraft.
- 8) The public requested more elaboration on potential mitigation.
- 9) Concern about noise impacts to people with post-traumatic stress disorder (PTSD), autism, etc. (special needs).

MI2.6 MITIGATION

The USAF does not have authority to expend appropriated funds on facilities that are not under the control of the USAF. As a military installation, compatible land use recommendations are provided to the local communities through the Air Installation Compatible Use Zones (AICUZ) program. Under this program, the USAF relies on local communities to control incompatible development through land use controls. The AICUZ program does not provide the ability to conduct off-base mitigation to structures within the community, and would be limited to reviewing flight procedures to identify operational parameters that could be modified to minimize impacts associated with noise.

Upon completion of the Final EIS, a mitigation plan will be prepared in accordance with 32 Code of Federal Regulations (CFR) 989.22(d). The mitigation plan will address specific mitigations identified and agreed to during the EIAP, as discussed in the EIS and identified in the Record of

Decision (ROD). The Mitigation and Monitoring Plan will be developed for those installations chosen, and will include metrics to track and monitor those activities that are identified to minimize the impacts. These could include afterburner usage, flight tracks, number of operations, etc. The Mitigation and Monitoring Plan will identify who is responsible for implementing specific mitigation procedures, who is responsible for funding them, and who is responsible for tracking these measures to ensure compliance.

MI3.0 127TH WING AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

MI3.1 NOISE

The following sections present the noise environment generated by military aircraft operations around the airfield, followed by an evaluation of the noise generated by military aircraft in training airspace. Both the affected environment and the Proposed Action Alternative (environmental consequences) are analyzed and the results presented. For purposes of this analysis, the No Action Alternative is the same as the affected environment, whereby no F-35A aircraft would be beddown at the installation and current operations would continue.

MI3.1.1 Installation

The USAF and ANG specify use of the NOISEMAP software program suite to model noise exposure at and around military air bases for military aircraft activity. Interviews with members of the 127 WG provided updates to the military flight operations to reflect current operational data at Selfridge ANGB.

Noise modeling utilized annual average day (AAD) aircraft operations computed by dividing the total yearly airport operations by 365 days per year. The noise modeling relies on aircraft's flight tracks (paths over the ground) and profiles (which includes altitude, airspeed, power settings, and other flight conditions). The noise analysis considers the numbers of each type of operation by aircraft/track/profile, local climate, terrain surrounding the airfield, and similar data related to aircraft engine runs that occur at specific static locations on the ground (e.g., pre- and post-flight and maintenance activities). A team primarily made up of representatives from the installation's flying squadrons and Air Traffic Controllers, as well as the NGB, developed this data through iterative meetings and discussions subsequently compiled into a data validation package. The NGB team reviewed the data validation package and approved the operational details for modeling (127 WG 2019).

MI3.1.1.1 Affected Environment

For the noise analysis at and around Selfridge ANGB, the affected environment is the area that experiences noise generated by aircraft operations. These areas include along taxiways, runways, engine run sites, and in adjacent airspace where aircraft operating at the airfield transit along flight routes, approach or depart the airfield, and conduct closed pattern operations.

Table MI3.1-1 summarizes the modeled annual military flight operations for aircraft based at Selfridge ANGB as well as transient military aircraft that visit the airfield on a temporary basis,

referred to as 'transients.' Current operations include 21,612 based and transient aircraft flight operations per year. Of the based aircraft operations, which comprise 92 percent of all annual operations, approximately 45 percent are fixed wing (predominately A-10 and KC-135) and approximately 55 percent are rotary wing (predominantly HH-65, H-60, and AStar). Night operations (those occurring after 10 p.m. to 7 a.m.) account for approximately 9 percent of all operations at the base.

Aircraft departing from Selfridge may be subject to a 5,000 feet MSL maximum altitude limit to avoid conflicting with aircraft on approach to Detroit Metropolitan Wayne County Airport. This altitude limitation affects 90 percent of Selfridge departures. While under a departure hold-down, A-10 aircraft typically maintain 3,000 or 4,000 feet MSL until approximately 10 miles from the base during a mandatory hold-down, while other aircraft types maintain 5,000 feet MSL.

 Table MI3.1-1. Annual Airfield Operations for Based and Transient Military Aircraft at

 Selfridge ANGB – Current

Aircraft Type	Modeled As	Arrivals Day 0700- 2200	Arrivals Night 2200- 0700	Departures Day 0700-2200	Departures Night 2200-0700	Closed Patterns Day 0700- 2200	Closed Patterns Night 2200- 0700	Total Day 0700- 2200	Total Night 2200- 0700	Total
Based Military Aircraft										
A-10	A-10C	2,316	72	2,388	0	322	0	5,026	72	5,098
CH-47	CH-47F	304	16	304	16	456	24	1,064	56	1,120
KC-135	KC-135R	588	88	608	68	1,277	75	2,473	231	2,704
HH-65	Bell 222	1,260	540	1,574	225	1,741	546	4,575	1,311	5,886
AStar	AStar	606	19	606	19	1,188	14	2,400	52	2,452
H-60	UH60A	386	20	387	18	605	10	1,378	48	1,426
King Air	C-12	342	6	342	6	42	0	726	12	738
C-206	GASEPF	196	4	196	4	24	0	416	8	424
	Subtotal Based	5,998	765	6,405	356	5,655	669	18,058	1,790	19,848
Transient Military Aircraft	Transient Military Aircraft									
Small Prop	C-12	246	40	234	52	0	0	480	92	572
Large Prop	C-130	64	12	64	12	0	0	128	24	152
Fighter	F-16	234	16	242	8	0	0	476	24	500
Light Jet	G5	24	0	24	0	0	0	48	0	48
Heavy Jet	KC-135	88	4	88	4	0	0	176	8	184
Helicopter	H-60	152	2	152	2	0	0	304	4	308
	Subtotal Transient	808	74	804	78	0	0	1,612	152	1,764
	Total Military Aircraft	6,806	839	7,209	434	5,655	669	19,670	1,942	21,612

Notes: 0700 = 7 a.m.; 2200 = 10 p.m.

For total airfield operations, a closed pattern includes two operations (one departure and one arrival). Totals may be off due to rounding.

Noise Exposure

Noise exposure computed with the NOISEMAP software program is presented graphically in a plot of contours lines of DNL, a table of DNL at specific noise-sensitive representative locations, and counts of on- and off-airport acreages within each noise contour.

Figure MI3.1-1 and Table MI3.1-2 present a graphical depiction and tabular description of the 28 Points of Interest (POIs), representing a cross section of nearby schools, places of worship, hospital, and daycare centers which inform on the adjacent residential area conditions. This is not intended to be an exhaustive list of POIs, but rather representative. The proposed corporate center and the residential neighborhood at Duluth Street currently experience the greatest DNL of 63 decibels (dB) followed by the residences at Hennings and Shiller at 61 dB DNL and Sugarbush at 60 dB DNL. No other POIs exceed 60 dB DNL under the affected environment.

POI Number	Named POI	DNL (dB)
1	Tots Learning Center	43
2	St. Mary Preschool	43
3	McLaren Macomb General Hospital	38
4	Proposed Corporate Center	63
5	Gateway Church	51
6	Faith Christian Center	48
7	Northridge Baptist Church	48
8	Tried Stone Missionary Baptist Church	42
9	Martin Chapel African Methodist Episcopal Zion Church	44
10	Faith Missionary Baptist Church	49
11	Knox Presbyterian Church	46
12	Brigantine Estates	55
13	City of Mount Clemens	36
14	Hennings and Shiller	61
15	Sugarbush Road and Sugarbush Estates Drive	60
16	Duluth Street	63
17	Dean A Naldrett School	47
18	Green Elementary School	49
19	Frederick V. Pankow Center	47
20	Christian Clemens School	42
21	L'Anse Creuse Adult Education School	39
22	South River School	54
23	Future Scholars Learning Center	41
24	Saint Louise School	42
25	Trinity Lutheran Church School	40
26	L'Anse Creuse High School	46
27	L'Anse Creuse Middle School	44
28	Emma V. Lobbestael Elementary School	42

Table MI3.1-2. DNL at Representative Points of Interest – Current

Legend: dB = decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest. *Source:* 127 WG 2019.



United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020

Figure MI3.1-2 shows the current DNL contours at Selfridge ANGB in 5 dB increments from 65 to 85 dB DNL. As shown, the 65 dB DNL contour extends outside of the installation boundary to the north by approximately 1,300 feet, which is caused by based A-10 and transient fighter jet departures on Runway 01. The 65 dB DNL contour also extends off the installation to the south and into the Clinton River by less than 100 feet due primarily to transient fighter aircraft departures from Runway 19. The 70 dB and greater noise contours remain within the installation boundary.

Table MI3.1-3 shows the acreage lying within noise contours of 65 to 85 dB DNL under the affected environment. Outside airport boundaries there are 21 acres within the 65 to 70 dB DNL noise contours; no acreage off-airport property is impacted by noise levels greater than 70 dB DNL.

DNL Level (dBA)	On Base	Off-Base	Total
65-70	375	21	396
70-75	224	0	224
75-80	46	0	46
80-85	6	0	6
>85	5	0	5
Total	656	21	677

 Table MI3.1-3.
 Acreage within Noise Contours Bands – Current

Note: Totals may be off due to rounding.

Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level. *Source:* 127 WG 2019.

Table MI3.1-4 presents noise exposure within each DNL contour band for off-airport household and population counts. According to the U.S. Census Bureau, households are defined as a house, an apartment, a mobile home, a group of rooms, or a single room occupied (or if vacant, intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live separately from any other people in the building and that have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people sharing living quarters (U.S. Census Bureau 2010). Contour bands were overlaid over aerial imagery and household buildings within each 5 dB contour band were counted manually. Buildings intersected by contour lines were counted as if exposed to the higher of the two bands. The number of people per household was determined independently for each U.S. Census block group (from the American Community Survey, 5-year estimates and U.S. Census Bureau 2010). Adopting this methodology gives a more accurate estimate of the number of people who may be exposed to noise levels within the noise contour band. Acreage reported here excludes the base itself because it does not include any POI residential areas. Exposure to noise levels of 65 dB DNL and greater outside of base boundaries includes no people or households.



United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020

Contour Band (dB DNL)	Population	Households
65-70	0	0
70–75	0	0
75-80	0	0
80-85	0	0
85+	0	0
Total	0	0
<i>I I</i> ID 1 'I	1 DNI D	NT' 1 / A

Table MI3.1-4.	Off-Base Noise Exposure within
Contour Band	s at Selfridge ANGB – Current

Legend: dB = decibel; DNL = Day-Night Average Sound Level.

Supplemental Metrics

To supplement the cumulative metric analysis, single-event sound exposure levels (SELs) are provided at each POI for the greatest noise events listed in Table MI3.1-5. SEL accounts for both the magnitude and duration of individual events, making it a good metric to compare disparate noise events. For each POI, Table MI3.1-5 shows the greatest noise event at each POI along with the number of weekly events during the day and nighttime periods. Also included are the previously shown DNL values at each POI for reference and to demonstrate that "loud" events may occur in areas of a lower DNL. For instance, at POI #10 (Faith Missionary Baptist Church), the point has a current DNL value of 49 dB, and has about two weekly events of transient F-16C flight operations which have an SEL of 97 dB.

In the affected environment, all of the greatest SELs are due to transient aircraft not assigned to Selfridge ANGB, such as F-16s. The loudest events tend to occur closest to the airfield and nearest the flight tracks that align with the runways at Selfridge ANGB. Although helicopters are generally quieter than fighter aircraft (like the F-16 and F-35A) they generate relative high single-event sound levels at the Frederick V. Pankow Center POI due to their lower altitude operation in that area.

Map ID	Named Point of Interest	DNL	SEL (dBA)	Average Events Per Week (Day)	Average Events Per Week (Night)
1	Tots Learning Center	43	88	2.3	0.1
2	St. Mary Preschool	43	90	2.3	0.1
3	McLaren Macomb General Hospital	38	82	2.3	0.1
4	Proposed Corporate Center	63	110	2.3	0.1
5	Gateway Church	51	96	2.3	0.1
6	Faith Christian Center	48	93	2.3	0.1
7	Northridge Baptist Church	48	94	2.3	0.1
8	Tried Stone Missionary Baptist Church	42	86	2.3	0.1
9	Martin Chapel African Methodist Episcopal Zion Church	44	89	2.3	0.1
10	Faith Missionary Baptist Church	49	97	2.3	0.1
11	Knox Presbyterian Church	46	94	2.3	0.1
12	Brigantine Estates	55	105	2.3	0.1
13	City of Mount Clemens	36	82	2.3	0.1
14	Hennings and Shiller	61	107	2.3	0.1
15	Sugarbush Road and Sugarbush Estates Drive	60	106	2.3	0.1
16	Duluth Street	63	113	2.3	0.1
17	Dean A Naldrett School	47	92	2.3	0.1
18	Green Elementary School	49	94	2.3	0.1
19	Frederick V. Pankow Center	47	93	2.3	0.1
20	Christian Clemens School	42	90	2.3	0.1
21	L'Anse Creuse Adult Education School	39	94	2.3	0.1
22	South River School	54	91	0.5	0.0
23	Future Scholars Learning Center	41	87	2.3	0.1
24	Saint Louise School	42	85	2.3	0.1
25	Trinity Lutheran Church School	40	105	2.3	0.1
26	L'Anse Creuse High School	46	89	2.3	0.1
27	L'Anse Creuse Middle School	44	89	2.3	0.1
28	Emma V. Lobbestael Elementary School	42	87	2.3	0.1

 Table MI3.1-5.
 Loudest Events at Each POI, Calculated SEL – Current

Legend: dB = decibel; dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest; SEL = Sound Exposure Level

Source: 127 WG 2019.

Classroom Learning Interference. To evaluate the potential for classroom learning interference, the exterior Equivalent Noise Level (L_{eq}) was computed for daytime events occurring during school hours for the 14 identified POIs. Table MI3.1-6 lists the computed L_{eq} and because no schools reach or exceed the screening criteria of 60 dB for the affected environment, no additional analysis would typically be required. However, in anticipation that some schools could reach or exceed that threshold for the Proposed Action, for consistency a full analysis has been performed for the affected environment. The average number of speech-interfering events per school day hour ranges from none to one per hour for the affected environment.

The time above metric is calculated to show the total number of minutes per school day that the interior noise level exceeds 50 dB in the classroom with windows open. Under current conditions,

this ranges from 0 minutes at six POIs to about 2 minutes at the Tots Learning Center, Dean A Naldrett School, Green Elementary, and Frederick V. Pankow Center.

Named POI	Exterior L _{eq(8)} (dBA)	Speech- Interfering Events per School Day (hour) ¹	Time Above 50 dBA per 8-Hour School Day (minutes) ¹
Tots Learning Center	44	1	2
St. Mary Preschool	43	0	0
Dean A Naldrett School	49	1	2
Green Elementary School	50	1	2
Frederick V. Pankow Center	48	1	2
Christian Clemens School	43	1	1
L'Anse Creuse Adult Education School	40	0	0
South River School	55	1	1
Future Scholars Learning Center	41	0	0
Saint Louise School	42	0	0
Trinity Lutheran Church School	40	0	0
L'Anse Creuse High School	47	0	1
L'Anse Creuse Middle School	45	0	1
Emma V. Lobbestael Elementary School	42	0	0
	Named POITots Learning CenterSt. Mary PreschoolDean A Naldrett SchoolGreen Elementary SchoolGreen Elementary SchoolChristian Clemens SchoolL'Anse Creuse Adult Education SchoolSouth River SchoolFuture Scholars Learning CenterSaint Louise SchoolTrinity Lutheran Church SchoolL'Anse Creuse High SchoolL'Anse Creuse Middle School	Named POIExterior Leq(8) (dBA)Tots Learning Center44St. Mary Preschool43Dean A Naldrett School49Green Elementary School50Frederick V. Pankow Center48Christian Clemens School43L'Anse Creuse Adult Education School40South River School55Future Scholars Learning Center41Saint Louise School42Trinity Lutheran Church School40L'Anse Creuse High School47L'Anse Creuse Middle School45Emma V. Lobbestael Elementary School42	Named POIExterior Leq(8) (dBA)Speech- Interfering Events per School Day (hour)1Tots Learning Center441St. Mary Preschool430Dean A Naldrett School491Green Elementary School501Frederick V. Pankow Center481Christian Clemens School400South River School551Future Scholars Learning Center410Saint Louise School420Trinity Lutheran Church School470L'Anse Creuse High School450Emma V. Lobbestael Elementary School420

 Table MI3.1-6.
 Classroom Speech Interference – Current

Note: ¹Assumes even distribution of daytime operations throughout the day.

Legend: dBA = A-weighted decibel; $L_{eq(8)}$ = 8-Hour Equivalent Noise Level; POI = Point of Interest. *Source*: 127 WG 2019.

Residential Speech Interference. Residential speech interference considers the number of hourly interruptions likely to interfere with speech-related activities (i.e., conversation and watching television) during a 15-hour day (from 7 a.m. until 10 p.m.). Interior levels of 50 dB represent the threshold for counting interference during the daytime. This analysis uses standard values for attenuation of 15 dB for windows opened and 25 dB for windows closed conditions. Table MI3.1-7 summarizes the results of this analysis for all 28 POIs. Typically this metric is applied only to residential locations but many of the other location types (i.e., school and places of worship) are located within or adjacent to residential areas so their computed results represent the nearby residences.

For the affected environment, with windows open the number of interfering events ranges from none at 11 POIs to a maximum of two per hour at the Proposed Corporate Center, Hennings and Shiller Street, and Sugarbush Road. The Proposed Corporate Center is primarily a commercial area while the other two POIs are residential neighborhoods. With windows closed, 21 POIs currently experience no interfering events, 7 POIs are exposed to an average of one event per hour, and no POIs to greater than one.

POI Number	Named POI	Windows Open ^{1, 2}	Windows Closed ^{1, 3}
1	Tots Learning Center	1	0
2	St. Mary Preschool	0	0
3	McLaren Macomb General Hospital	0	0
4	Proposed Corporate Center	2	1
5	Gateway Church	1	1
6	Faith Christian Center	1	0
7	Northridge Baptist Church	1	0
8	Tried Stone Missionary Baptist Church	1	0
9	Martin Chapel African Methodist Episcopal Zion Church	1	0
10	Faith Missionary Baptist Church	1	0
11	Knox Presbyterian Church	0	0
12	Brigantine Estates	1	0
13	City of Mount Clemens	0	0
14	Hennings and Shiller	2	1
15	Sugarbush Road and Sugarbush Estates Drive	2	1
16	Duluth Street	1	1
17	Dean A Naldrett School	1	1
18	Green Elementary School	1	1
19	Frederick V. Pankow Center	1	0
20	Christian Clemens School	1	0
21	L'Anse Creuse Adult Education School	0	0
22	South River School	1	0
23	Future Scholars Learning Center	0	0
24	Saint Louise School	0	0
25	Trinity Lutheran Church School	0	0
26	L'Anse Creuse High School	0	0
27	L'Anse Creuse Middle School	0	0
28	Emma V. Lobbestael Elementary School	0	0
<i>Notes</i> : 1. Assumes even distribution of daytime operations throughout the day. 2. Assumes 15 dB attenuation			

 Table MI3.1-7. Residential Speech Interference Events per Hour– Current

2. Assumes 15 dB attenuation. 3. Assumes 25 dB attenuation. POI = Point of Interest.

Sources: 127 WG 2019.

Sleep Disturbance. A common concern in residential areas exposed to environmental noise is the potential for sleep disturbance. Sleep disturbance only applies to residential areas but the analysis has been computed for all POIs because many other types of POIs (schools and places of worship) include nearby residences. Table MI3.1-8 lists the computed probability of awakening for both windows open and windows closed conditions based on the American National Standards Institute (ANSI) S12.9 standard. Current probability of awakening varies ranges from 1 to 5 percent for windows open and up to a maximum of 2 percent for windows closed.

POI Number	Named POI	Windows Open ^{1, 2}	Windows Closed ^{1, 3}
1	Tots Learning Center	1%	<1%
2	St. Mary Preschool	1%	<1%
3	McLaren Macomb General Hospital	1%	<1%
4	Proposed Corporate Center	5%	2%
5	Gateway Church	2%	1%
6	Faith Christian Center	3%	1%
7	Northridge Baptist Church	3%	1%
8	Tried Stone Missionary Baptist Church	2%	<1%
9	Martin Chapel African Methodist Episcopal Zion Church	2%	<1%
10	Faith Missionary Baptist Church	2%	1%
11	Knox Presbyterian Church	2%	1%
12	Brigantine Estates	3%	2%
13	City of Mount Clemens	1%	<1%
14	Hennings and Shiller	3%	1%
15	Sugarbush Road and Sugarbush Estates Drive	4%	1%
16	Duluth Street	3%	2%
17	Dean A Naldrett School	1%	<1%
18	Green Elementary School	2%	<1%
19	Frederick V. Pankow Center	3%	1%
20	Christian Clemens School	2%	<1%
21	L'Anse Creuse Adult Education School	1%	<1%
22	South River School	3%	1%
23	Future Scholars Learning Center	1%	<1%
24	Saint Louise School	1%	<1%
25	Trinity Lutheran Church School	1%	<1%
26	L'Anse Creuse High School	2%	<1%
27	L'Anse Creuse Middle School	1%	<1%
28	Emma V. Lobbestael Elementary School	1%	<1%

 Table MI3.1-8.
 Probability of Awakening Events (Daytime) – Current

 Notes:
 ¹Assumes even distribution of daytime operations throughout the day.

 ²Assumes 15 dB attenuation.

 ³Assumes 25 dB attenuation.

 Legend:
 POI = Point of Interest.

Sources: 127 WG 2019.

Potential for Hearing Loss. Potential for Hearing Loss (PHL) applies to people living in high noise environments. The threshold for assessing PHL is exposure to noise greater than 80 dB DNL. Under the affected environment there are no residential areas on or adjacent to the base that are exposed to contour bands of 80 dB DNL or greater (see Table MI3.1-4), so PHL does not apply.

Occupational Noise. USAF occupational noise exposure prevention procedures, such as hearing protection and monitoring, are currently used and comply with all applicable Occupational Safety and Health Administration (OSHA) and USAF occupational noise exposure regulations.

Other Noise Sources. Other generators of noise, such as vehicle traffic, and other maintenance and landscaping activities, are a common ongoing occurrence at Selfridge ANGB. While these sources may contribute to the overall noise environment, they are not distinguishable from aircraft-generated noise at and adjacent to the airport. For this reason, these other noise sources were not considered under affected environment nor are they analyzed under environmental consequences.

MI3.1.1.2 Environmental Consequences

Proposed Action

The Proposed Action Alternative involves the beddown of 18 F-35A aircraft at the 127 WG installation and replacement of the based A-10s. Proposed annual F-35A flight operations total 6,746, about 1,648 more operations when compared to the affected environment. The F-35A aircraft would account for approximately 29 percent of total operations in the airfield. Other than occasional arrivals and departures, F-35As would not be expected to operate after 10 p.m. or before 7 a.m. NGB estimates that the F-35A would use afterburner on up to 5 percent of departures and military power on the remainder. Individual flight profiles have been modeled for the two departure types. In addition, the F-35A would be subject to the same mandatory hold-down procedures during departures to avoid conflict with aircraft on approach to Detroit Metropolitan Wayne County Airport. Unlike the A-10s maintaining hold-down altitudes of 3,000 or 4,000 feet MSL, the F-35A would hold at 5,000 feet MSL matching transient fighter aircraft procedures.

Noise Exposure

Figure MI3.1-3 shows the DNL contours for the Proposed Action Alternative at Selfridge ANGB in 5 dB increments from 65 to 85 dB DNL. The gradient coloring provides a 'heat map' of sound from low to high levels to supplement the discrete contour lines. As shown, the 65 dB DNL contour would extend beyond the installation boundary to the north approximately 1.6 miles due primarily to F-35A departures from Runway 01. Additionally, the 70 and 75 dB DNL contours would extend to the north 0.7 and 0.2 mile, respectively, also due to F-35A departures. The 65 and 70 dB DNL contours would also extend approximately 0.6 mile and 0.1 mile south beyond the base boundary due to F-35A departures on Runway 19.

Figure MI3.1-4 shows the comparison between the Current and Proposed Action DNL contours. F-35A would operate at similar altitudes as the existing A-10s for closed pattern and arrival operations but at higher altitudes upon departure due to the superior climb performance of the F-35A and a higher hold-down altitude of 5,000 feet MSL. Despite reaching higher altitudes quicker after take-off, the F-35A generates greater sound levels due to differences inherent to the aircraft and engine.



United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020

United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



Table MI3.1-9 lists the computed DNL for each of the 28 POIs under the Proposed Action Alternative along with changes relative to the affected environment. Under the Proposed Action Alternative, DNL values at the POIs would range from 45 to 73 dB. Of the 28 POI locations, the Proposed Corporate Center and the residential neighborhoods near Hennings and Shiller Street, Sugarbush Road, and Duluth Street, would be exposed to DNL ranging from 68 to 73 dB. Gateway Church, Brigantine Estates, Dean A Naldrett School, Green Elementary, and South River School would be exposed to DNL between 61 and 62 dB. All remaining POIs would be exposed to DNL less than 60 dB. Eight POIs would experience increases in DNL greater than 10 dB with the largest increase of 14 occurring at Dean A Naldrett School followed by 13 dB increases at both Tots Learning Center and Green Elementary School. The remaining POIs would experience increase in DNL of 6 to 11 dB.

POI Number	Named POI	Proposed Action Alternative DNL (dB)	Change from Current in DNL (dB)
1	Tots Learning Center	56	+13
2	St. Mary Preschool	50	+7
3	McLaren Macomb General Hospital	46	+8
4	Proposed Corporate Center	73	+10
5	Gateway Church	62	+11
6	Faith Christian Center	59	+11
7	Northridge Baptist Church	59	+11
8	Tried Stone Missionary Baptist Church	51	+9
9	Martin Chapel African Methodist Episcopal Zion Church	52	+8
10	Faith Missionary Baptist Church	55	+6
11	Knox Presbyterian Church	52	+6
12	Brigantine Estates	62	+7
13	City of Mount Clemens	45	+9
14	Hennings and Shiller	70	+9
15	Sugarbush Road and Sugarbush Estates Drive	70	+10
16	Duluth Street	68	+5
17	Dean A Naldrett School	61	+14
18	Green Elementary School	62	+13
19	Frederick V Pankow Center	56	+9
20	Christian Clemens School	51	+9
21	L'Anse Creuse Adult Education School	47	+8
22	South River School	62	+8
23	Future Scholars Learning Center	48	+7
24	Saint Louise School	49	+7
25	Trinity Lutheran Church School	47	+7
26	L'Anse Creuse High School	53	+7
27	L'Anse Creuse Middle School	51	+7
28	Emma V. Lobbestael Elementary School	51	+9

Table MI3.1-9. Proposed Action Alternative DNL at Points of Interest

Legend: dB = decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest.

Source: 127 WG 2019.
Table MI3.1-10 lists the acreage of the areas defined by the noise contour bands under the Proposed Action condition, and compares those to the values for the affected environment. Most of the growth in contours from the Proposed Action appear in the north due to the F-35A being louder than the A-10 during take-off in the immediate runway environment. Off-base acreage that would be exposed to 65 dB DNL, or greater, would increase by 1,073 acres to 1,094 total acres. Off-base acreage exposed to 70 dB DNL, or greater, would increase from none to 231 acres. The households exposed to 65 dB DNL and greater would increase from none to 1,034 and the affected population from none to 2,902. This would be considered a significant impact to those persons affected.

DNL (dB)	Proposed Action Alternative Acreage	Proposed Action Alternative Estimated Population	Proposed Action Alternative Households	Change from Current Acreage	Change from Current Estimated Population	Change from Current Households
65-70	863	2,772	989	+ 842	2,772	989
70–75	224	130	45	+ 224	130	+ 45
75-80	7	0	0	+ 7	0	0
80-85	0	0	0	0	0	0
85+	0	0	0	0	0	0
Total	1,094	2,902	1,034	+ 1,073	2,902	+ 1,034

Table MI3.1-10. Proposed Action Alternative On- and Off-Airport Noise Exposure

Legend: dB = decibel; DNL = Day-Night Average Sound Level *Source:* 127 WG 2019.

Supplemental Metrics

Consistent with the affected environment supplemental analysis, single-event SELs are provided at each POI for the greatest noise events. Table MI3.1-11 shows the aircraft producing the greatest noise along with the weekly events during the environmental daytime and nighttime hours. Also included are the DNL values at the POIs, which demonstrate that some "loud" events occur in areas of a lower DNL. In the Proposed Action scenario, the F-35A would become the top contributor at all POIs with the greatest occurring at Duluth Street (119 dB), Proposed Corporate Center (114 dB), Trinity Lutheran Church School (111 dB), Brigantine Estates (111 dB), and Sugarbush Road (111 dB). In general, the maximum SELs under the Proposed Action would be 3 to 8 dB greater than currently occur at the analyzed POIs. The loudest events would continue to occur closest to the airfield and nearest the flight tracks that align with the airport runway departures.

Map ID	Named Point of Interest	Current DNL	Current SEL (dBA)	Current Average Events Per Week (Daytime)	Current Average Events Per Week (Night)	Proposed Action DNL	Proposed Action SEL (dBA)	Proposed Action Average Events Per Week (Daytime)	Proposed Action Average Events Per Week (Night)
1	Tots Learning Center	43	88	2.3	0.1	56	95	5.0	0
2	St. Mary Preschool	43	90	2.3	0.1	50	96	2.5	0
3	McLaren Macomb General Hospital	38	82	2.3	0.1	46	88	0.0	0
4	Proposed Corporate Center	63	110	2.3	0.1	73	114	5.0	0
5	Gateway Church	51	96	2.3	0.1	62	102	5.0	0
6	Faith Christian Center	48	93	2.3	0.1	59	100	45.2	0
7	Northridge Baptist Church	48	94	2.3	0.1	59	100	45.2	0
8	Tried Stone Missionary Baptist Church	42	86	2.3	0.1	51	93	0.0	0
9	Martin Chapel African Methodist Episcopal Zion Church	44	89	2.3	0.1	52	97	0.0	0
10	Faith Missionary Baptist Church	49	97	2.3	0.1	55	103	2.5	0
11	Knox Presbyterian Church	46	94	2.3	0.1	52	100	0.3	0
12	Brigantine Estates	55	105	2.3	0.1	62	111	0.3	0
13	City of Mount Clemens	36	82	2.3	0.1	45	89	0.0	0
14	Hennings and Shiller	61	107	2.3	0.1	70	110	5.0	0
15	Sugarbush Road and Sugarbush Estates Drive	60	106	2.3	0.1	70	111	5.0	0
16	Duluth Street	63	113	2.3	0.1	68	119	0.3	0
17	Dean A Naldrett School	47	92	2.3	0.1	61	99	5.0	0
18	Green Elementary School	49	94	2.3	0.1	62	101	0.3	0
19	Frederick V Pankow Center	47	93	2.3	0.1	56	99	0.3	0
20	Christian Clemens School	42	90	2.3	0.1	51	98	0.3	0
21	L'Anse Creuse Adult Education School	39	94	2.3	0.1	47	101	5.0	0
22	South River School	54	91	0.5	0.0	62	98	0.3	0
23	Future Scholars Learning Center	41	87	2.3	0.1	48	94	0.0	0
24	Saint Louise School	42	85	2.3	0.1	49	92	0.0	0
25	Trinity Lutheran Church School	40	105	2.3	0.1	47	111	0.3	0
26	L'Anse Creuse High School	46	94	2.3	0.1	53	101	2.8	0
27	L'Anse Creuse Middle School	44	93	2.3	0.1	51	99	2.8	0
28	Emma V. Lobbestael Elementary School	42	91	2.3	0.1	51	98	2.8	0

Table MI3.1-11. Loudest Events at Each Selfridge ANGB POI, Measured in SEL – Proposed Action Alternative

Legend: dBA = A-weighted decibel; DNL = Day-Night Average Sound Level; POI = Point of Interest; SEL = Sound Exposure Level

Classroom Learning Interference. As noted under affected environment, 14 of the 25 POIs identified near the base are schools or childcare centers. Table MI3.1-12 lists these points along with the calculation of the various metrics with the windows closed. Under the Proposed Action, three schools (Dean A. Naldrett School, Green Elementary School, and South River School) would exceed the screening threshold of 60 dB, reaching 63 to 64 dB 8-hour Equivalent Noise Level $(L_{eq[8]})$. This would represent increases of 8 to 14 dB relative to the affected environment.

The average number of speech-interfering events per school day hour would increase to one per average hour for all locations. These interfering events would likely cluster within relatively short time periods rather than be spread throughout the school day.

The time above 50 dB would increase between 1 and 2 minutes to a maximum of 5 minutes at Green Elementary School due to the Proposed Action.

POI ID	Named POI	Outdoor L _{eq(8)} (dBA) Current	Outdoor L _{eq(8)} (dBA) Proposed	Outdoor L _{eq(8)} (dBA) Change Relative to Current	Number of Events Interrupting Speech per School Day (hour) ¹	Time above 50 dBA per 8-hour School Day (minutes) ¹
1	Tots Learning Center	44	58	+14	1	3
2	St. Mary Preschool	43	51	+8	1	2
17	Dean A Naldrett School	49	63	+14	1	4
18	Green Elementary School	50	64	+14	1	5
19	Frederick V Pankow Center	48	58	+10	1	4
20	Christian Clemens School	43	53	+10	1	4
21	L'Anse Creuse Adult Education School	40	49	+9	1	4
22	South River School	55	63	+8	1	2
23	Future Scholars Learning Center	41	50	+9	1	1
24	Saint Louise School	42	50	+8	1	1
25	Trinity Lutheran Church School	40	49	+9	1	-
26	L'Anse Creuse High School	47	54	+7	1	1
27	L'Anse Creuse Middle School	45	53	+8	1	1
28	Emma V. Lobbestael Elementary School	42	53	+11	1	1

 Table MI3.1-12.
 Classroom Speech Interference – Proposed Action Alternative

Note: ¹Assumes even distribution of daytime operations throughout the day. Totals may be off due to rounding.

Legend: dBA = A-weighted decibel; $L_{eq(8)} = 8$ -Hour Equivalent Noise Level; POI = Point of Interest.

Source: 127 WG 2019.

Residential Speech Interference. Residential Speech Interference considers the number of hourly interruptions likely to interfere with speech-related activities (i.e., conversation and watching television) during a 15-hour day (from 7 a.m. until 10 p.m.). Table MI3.1-13 summarizes the results of this analysis for all 28 POIs. Typically this metric is applied only to residential locations

but many of the other location types (i.e., school and places of worship) are located within or adjacent to residential areas so their computed results represent the nearby residences.

Under the Proposed Action, the average number of interfering events per hour with windows open would range from one to two, with the maximum occurring at seven locations. With windows closed, both the Proposed Corporate Center and Hennings and Shiller Street would experience an average of two speech-interfering events per hour. The majority of POIs would experience an increase of one interfering event per hour with either the windows open or windows closed condition.

POI Number	Named POI	Windows Open ^{1, 2} Proposed Action	Windows Closed ^{1, 3} Proposed Action	Windows Open ^{1, 2} Change	Windows Closed ^{1, 3} Change
1	Tots Learning Center	1	1	0	+1
2	St. Mary Preschool	1	1	+1	+1
3	McLaren Macomb General Hospital	1	1	+1	+1
4	Proposed Corporate Center	2	2	0	+1
5	Gateway Church	2	1	+1	0
6	Faith Christian Center	2	1	+1	+1
7	Northridge Baptist Church	2	1	+1	+1
8	Tried Stone Missionary Baptist Church	1	1	0	+1
9	Martin Chapel African Methodist Episcopal Zion Church	1	1	0	+1
10	Faith Missionary Baptist Church	1	1	0	+1
11	Knox Presbyterian Church	1	0	+1	0
12	Brigantine Estates	2	1	+1	+1
13	City of Mount Clemens	1	0	+1	0
14	Hennings and Shiller	2	2	0	+1
15	Sugarbush Road and Sugarbush Estates Drive	2	1	0	0
16	Duluth Street	1	1	0	0
17	Dean A Naldrett School	1	1	0	0
18	Green Elementary School	1	1	0	0
19	Frederick V. Pankow Center	1	1	0	+1
20	Christian Clemens School	1	1	0	+1
21	L'Anse Creuse Adult Education School	1	1	+1	+1
22	South River School	1	1	0	+1
23	Future Scholars Learning Center	1	0	+1	0
24	Saint Louise School	1	0	+1	0
25	Trinity Lutheran Church School	1	0	+1	0
26	L'Anse Creuse High School	1	0	+1	0
27	L'Anse Creuse Middle School	1	0	+1	0
28	Emma V. Lobbestael Elementary School	1	0	+1	0
37.4		1 .1			-

Table MI3.1-13. Residential	Speech Interference Events – I	Proposed Action Alternative
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Notes: ¹Assumes even distribution of daytime operations throughout the day. ²Assumes 15 dB attenuation.

³Assumes 25 dB attenuation.

Legend: POI = Point of Interest.

Sources: 127 WG 2019.

Sleep Disturbance. Table MI3.1-14 shows the probability of awakening for each POI, consistent with the ANSI standard S12.9 methodology used in the affected environment analysis. Note that while residences may not be present at each of the POIs, the points serve as good representations of the noise environment in the immediate vicinity, which often include residences. The probability of awakening due to the Proposed Action would not change at 20 POIs, increase by 1 percent for either windows open or windows closed at 6 POIs, and increase by 1 percent for both windows open and windows closed at 2 POIs (Hennings and Shiller and the Dean A Naldrett School). The F-35A would operate minimally during the DNL nighttime period (after 10 p.m. local), so changes to probability of awakening would be small relative to the affected environment.

POI ID	Named POI	Windows Open ¹ Proposed Action	Windows Closed ² Proposed Action	Windows Open ¹ Change	Windows Closed ² Change
1	Tots Learning Center	1%	<1%	0%	0%
2	St. Mary Preschool	1%	<1%	0%	0%
3	McLaren Macomb General Hospital	1%	<1%	0%	0%
4	Proposed Corporate Center	5%	2%	0%	0%
5	Gateway Church	2%	1%	0%	0%
6	Faith Christian Center	3%	1%	0%	0%
7	Northridge Baptist Church	4%	1%	+1%	0%
8	Tried Stone Missionary Baptist Church	2%	<1%	0%	0%
9	Martin Chapel African Methodist Episcopal Zion Church	2%	<1%	0%	0%
10	Faith Missionary Baptist Church	2%	1%	0%	0%
11	Knox Presbyterian Church	2%	1%	0%	0%
12	Brigantine Estates	3%	2%	0%	0%
13	City of Mount Clemens	1%	<1%	0%	0%
14	Hennings and Shiller	4%	2%	+1%	+1%
15	Sugarbush Road and Sugarbush Estates Drive	4%	2%	0%	+1%
16	Duluth Street	4%	2%	+1%	0%
17	Dean A Naldrett School	2%	1%	+1%	+1%
18	Green Elementary School	2%	1%	0%	+1%
19	Frederick V Pankow Center	4%	1%	+1%	0%
20	Christian Clemens School	2%	<1%	0%	0%
21	L'Anse Creuse Adult Education School	1%	<1%	0%	0%
22	South River School	3%	1%	0%	0%
23	Future Scholars Learning Center	1%	<1%	0%	0%
24	Saint Louise School	1%	<1%	0%	0%
25	Trinity Lutheran Church School	1%	<1%	0%	0%
26	L'Anse Creuse High School	2%	<1%	0%	0%
27	L'Anse Creuse Middle School	2%	<1%	+1%	0%
28	Emma V. Lobbestael Elementary School	1%	<1%	0%	0%

Table MI3.1-14.	Probability	of Awakening -	- Proposed	Action	Alternative
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Notes: ¹Assumes 15 dB attenuation.

²Assumes 25 dB attenuation.

Legend: POI = Point of Interest.

Sources: 127 WG 2019.

Potential for Hearing Loss. Under the Proposed Action Alternative, no residential areas on or adjacent to Selfridge ANGB would be exposed to DNL greater than or equal to 80 dB. Therefore, a PHL is not anticipated due to the Proposed Action. This conclusion is justified because hearing loss due to noise exposure would generally require daily exposure over 40 years, or longer, to DNL greater than 80 dB.

Occupational Noise. NGB occupational noise exposure prevention procedures, such as hearing protection and monitoring, would continue to be applied under the Proposed Action Alternative. These procedures would comply with all applicable OSHA and NGB occupational noise exposure regulations and ensure no significant adverse impacts under the Proposed Action Alternative.

Other Noise Sources. Noise is an unavoidable, short-term byproduct of construction activities. The major noise events for this construction would take place inside airport boundaries at Selfridge ANGB with only a negligible increase in traffic noise caused by vehicles entering and exiting the base for construction deliveries and work force arrivals and departures. During construction, steps would be taken to minimize any impacts. These include making sure all equipment is in good operating condition, with an emphasis on maintenance of mufflers, bearings, and moving machinery parts. Stationary equipment with a potential to emit noise would be placed away from sensitive noise receptors. Whenever possible, noise events would be scheduled to avoid noise-sensitive times. Construction workers would comply with OSHA exposure regulations to ensure no significant adverse effects from noise exposure.

No Action Alternative

Under the No Action Alternative, the acoustic environment at and around the base would not differ from the conditions presented under the affected environment. Therefore, refer to Section MI3.1.1.1 for noise exposure and supplemental noise metrics. Impacts under the No Action Alternative would not be significant.

MI3.1.2 Airspace

The U.S. Government prescribes the use of the Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) for aircraft noise analysis in the SUA environment. L_{dnmr} is based on the month with the most aircraft activity in each airspace unit to account for the sporadic nature of operations. L_{dnmr} is similar to the DNL except that an additional penalty is applied to account for the startle effect of aircraft operating at low altitudes and at high rates of speed (over 400 knots) generating quick sound level increases. The penalty is calculated from the rate of increase in sound level and varies from 0 to 11 dB. Noise modeling, using MR_NMAP, was accomplished by determining the operations in of each airspace unit and building each aircraft's flight profiles based on the aircraft's configuration (airspeed and power setting) and the amount of time spent at various altitudes throughout the airspace.

BOOMAP was used to calculate the C-weighted Day-Night Average Sound Level (CDNL) resulting from the proposed supersonic operations in the Alpena Airspace Complex. This metric captures the impulsive characteristics of supersonic noise as DNL. Supersonic flight activity only occurs where authorized.

In rural and open areas, the analysis of noise impacts are vastly different compared to areas near population centers. In these areas, public concerns can include effects to wildlife, domestic animals, natural sounds, and outdoor recreation. Although many studies have been conducted on noise impacts to animals, if the animal of concern has not been included in any of these studies, biological expertise is required to determine if additional research is required or a surrogate animal can be used for the assessment of impacts. See Section MI3.11, *Biological Resources*, for a discussion of noise impacts to wildlife.

MI3.1.2.1 Affected Environment

The 127 WG uses the Alpena Airspace Complex, including Restricted Areas and ATCAAs, for training during each mission (see Figure MI2.2-1). Under the affected environment, there are up to 2,388 sorties in the airspace attributable to the A-10s of the 127 WG. In addition to the 127 WG A-10s, the Alpena Airspace Complex activity includes the F-16C (primarily from the 112th Fighter Squadron) (36 percent), KC-135 from Selfridge ANGB (11 percent), and B-52 from Minot Air Force Base (AFB) (5 percent).

Noise Exposure

Subsonic. Table MI3.1-15 shows the L_{dnmr} levels, rounded to whole decibels, for the affected environment within each of the respective MOAs/ATCAAs/Restricted Areas. Noise levels in areas under the MOAs range from 35 to 53 dB L_{dnmr} , which includes the noise contribution from ATCAAs directly over them. L_{dnmr} values listed as and they are simply listed as "<35 dB" because the computed L_{dnmr} due to aircraft activity is likely below the ambient sound level. In these areas with aircraft flying at higher altitudes, the noise contribution from subsonic flight activity is negligible on the ground.

Airspace	L _{dnmr} (dB)
R-4201A	53
R-4201B	40
Grayling MOA	<35
Pike E MOA	<35
Pike W MOA	<35
Steelhead MOA	<35

 Table MI3.1-15.
 Ldnmr Beneath SUA – Affected Environment

Legend: dB = decibel; L_{dnmr} = Onset-Rate Adjusted Day-Night Average Sound Level; R- = Restricted Area.

Source: 127 WG 2019.

Supersonic. Supersonic operations are not approved for use in the Alpena complex on a full-time basis. Supersonic activity is typically approved for a week once to twice per year. During a week of activity, a total of 120 supersonic operations typically occur resulting in a total of 240 per year.

Table MI3.1-16 shows the CDNL highest levels calculated for the affected environment within each of the respective MOA/ATCAA/Restricted Area. The highest concentration of sonic boom activity (and resulting in maximum CDNL) is in the Pike East and Pike West MOA and the Firebird ATCAA, which is 46 C-weighted decibels (dBC). Normal land use restriction recommendations start when CDNL is at 62 and greater dBC; therefore, a level at 46 dBC is well below the recommended land use restrictions level.

Airspace	CDNL (dBC)
R-4201A	23
R-4201B	22
Grayling MOA	35
Pike E MOA	46
Pike W MOA	46
Steelhead MOA	44
Firebird ATCAA	46
Garland ATCAA	35
Lumberjack ATCAA	46
Molson ATCAA	43
Steelhead ATCAA	44

 Table MI3.1-16.
 CDNL Beneath SUA – Affected Environment

Legend: ATCAA = Air Traffic Control Assigned Airspace; CDNL = C-weighted Day-Night Average Sound Level; dBC = C-weighted decibel; MOA = Military Operations Area; R- = Restricted Area.

Source: 127 WG 2019.

MI3.1.2.2 Environmental Consequences

Proposed Action

This section presents noise conditions in the airspace and ranges that would be used by F-35A aircraft under the 127 WG Alternative. Under the Proposed Action Alternative, there would be an

increase of 28 percent of sorties in the airspace, with each sortie lasting 30-60 minutes. Therefore, there would be an approximately 54 percent increase in the time spent in the airspace by 127 WG aircraft. Although the F-35A would be expected to operate more often at higher altitudes than the A-10, no other changes in airspace or airspace use are proposed. The noise analysis accounts for subsonic flight operations and supersonic operations in airspace that is authorized for supersonic flight. Subsonic noise is quantified by dB L_{dnmr} ; the cumulative sonic boom environment is quantified by CDNL and by the number of booms per month that would be heard on the surface.

Noise Exposure

Subsonic. Table MI3.1-17 shows the L_{dnmr} levels for the Proposed Action Alternative conditions within each of the respective MOAs/ATCAAs/Restricted Areas in addition to the change between the two alternatives. The areas under the MOAs would range from 39 to 58 dB. These include the ATCAAs directly over them. Depending on the location, the increases range from 4 to 9 dB due to the greater noise levels of the F-35A. Although the F-35A is expected to fly fewer sorties, it has greater effect due to it being powered by an afterburning engine. The largest projected change would be under the Pike East MOA, which would increase about 9 dB to 44 dB. No areas would reach or exceed 65 dB L_{dnmr}.

The noise levels computed in Table MI3.1-17 represent only the military aircraft contributions to sound levels and does not consider other sources, such as road traffic and wind. Typical ambient L_{dnmr} for 'quiet suburban residential' areas range from 49 to 52 dB while rural is typically less than 49 dB (ANSI 2013). Although all areas listed in Table MI3.1-17 would experience relatively large increases in L_{dnmr} due to aircraft noise, the proposed level likely would not exceed current ambient levels when other noise sources are accounted for, except R-4201A, which is more likely to exceed ambient levels by a noticeable amount.

Deneath SOA to the Affected Environment					
Description	Current L _{dnmr} (dB)	Proposed Action Alternative L _{dnmr} (dB)	Change in L _{dnmr} (dB)		
R-4201A	53	58	+5		
R-4201B	40	46	+6		
Grayling MOA	35	41	+6		
Pike E MOA	<35	44	+9		
Pike W MOA	<35	39	+4		
Steelhead MOA	<35	41	+6		

 Table MI3.1-17. Comparison of the Proposed Action Alternative Ldnmr

 Beneath SUA to the Affected Environment

Legend: dBC = decibel; L_{dnmr} = Onset-Rate Adjusted Day-Night Average Sound Level; MOA = Military Operations Area; R- = Restricted Area. *Source:* 127 WG 2019.

Supersonic. Supersonic operations are not approved for the Alpena complex on a full-time basis. Supersonic activity is typically approved for a week once to twice per year. The Proposed Action

considered 80 F-35A sorties and 80 "other" aircraft sorties per week of activity for 2 weeks, or 320 supersonic sorties annual. This assumes a steady demand by the local F-35A aircraft, and continued use by F-16 from nearby bases (Toledo), which are added to the "other" category. This represents a 40-sortie increase under the Proposed Action over the current conditions, for the short period once or twice per year when supersonic activity is allowed. Table MI3.1-18 lists the highest CDNL levels calculated for the Proposed Action Alternative ranging from 24 to 47 dB CDNL. The highest concentration of sonic boom activity (and resulting in maximum CDNL) would be the Pike West and Pike East MOA junction, which is roughly the center of the larger complex. In this area, under the Proposed Action, the CDNL would be 47 dB. The shift from current conditions to the Proposed Action Alternative would result in an increase of 1-2 dB CDNL. Normal land use restriction recommendations start when CDNL is at 62 and greater dBC; therefore, a level at 47 dBC CDNL and lower are well below the recommended land use restrictions level. Additionally, it is noted that a good deal of the noise resulting from sonic booms would occur over water.

Airspace Unit	Current CDNL (dBC)	Proposed Action Alternative CDNL (dBC)	Change in CDNL (dBC)
R-4201A	23	25	+2
R-4201B	22	24	+2
Grayling MOA	35	37	+1
Pike E MOA	46	47	+1
Pike W MOA	46	47	+1
Steelhead MOA	44	45	+1
Firebird ATCAA	46	47	+1
Garland ATCAA	35	37	+2
Lumberjack ATCAA	46	47	+1
Molson ATCAA	43	44	+1
Steelhead ATCAA	44	45	+1

 Table MI3.1-18. Comparison of the Proposed Action Alternative CDNL

 Beneath SUA to the Affected Environment

Legend: ATCAA = Air Traffic Control Assigned Airspace; CDNL = C-weighted Day-Night Average Sound Level; dBC = C-weighted decibel; MOA = Military Operations Area; R- = Restricted Area. Source: 127 WG 2019.

No Action Alternative

Under the No Action Alternative, the acoustic environment in the airspace would not differ from the conditions presented under the affected environment. Therefore, refer to Section MI3.1.2.1 for noise exposure and supplemental noise metrics.

MI3.1.3 Summary of Impacts

Under the Proposed Action at Selfridge ANGB, F-35A aircraft operations at the base would increase off-base acreage contained within the 65 dB DNL and greater noise contours by 1,073 acres. There would be an estimated addition of 1,034 households and 2,902 people that would reside within the 65-75 dB DNL contours, where residential land use is considered conditionally

compatible. Predicted changes in the DNL at POIs range from 5 to 14 dB with levels one representative POI exceeding 70 dB. The school L_{eq} would increase by 7 to 14 dB shifting three school locations up to the 60 to 65 dB range. Eight of the POI schools located within the Region of Influence (ROI) would experience an increase in the number of events per hour causing speech interference, but none would exceed one event per hour. The predicted increase in L_{dnmr} in SUA would range from 4 to 9 dB with the highest L_{dnmr} remaining below 60 dB. Highest CDNL levels calculated for the Proposed Action Alternative ranging up to 47 dBC CDNL. Additional discussion regarding noise impacts on factors such as health effects and noise-induced vibration effects can be found in Appendix B, *Noise Modeling, Methodology, and Effects*. Based on context and intensity, the change in the noise environment associated with the Proposed Action would be considered significant in the area surrounding the airfield but would not be significant in the SUA.

There is little opportunity for the USAF to provide noise mitigation at Selfridge ANGB. The USAF does not have authority to expend appropriated funds on facilities that are not under the control of the USAF. As a military installation, compatible land use recommendations are provided to the local communities through the AICUZ program. Under this program, the USAF relies on local communities to control incompatible development through land use controls. The AICUZ program does not provide the ability to conduct off-base mitigation to structures within the community, and would be limited to reviewing flight procedures to identify operational parameters that could be modified to minimize impacts associated with noise.

A Mitigation and Monitoring Plan will be developed for those installations chosen, and will include metrics to track and monitor those activities that are identified to minimize the impacts. These could include afterburner usage, flight tracks, number of operations, etc. The Mitigation and Monitoring Plan will identify who is responsible for implementing specific mitigation procedures, who is responsible for funding them, and who is responsible for tracking these measures to ensure compliance.

MI3.2 AIRSPACE

MI3.2.1 Installation

MI3.2.1.1 Affected Environment

Selfridge ANGB is located approximately 20 miles north of Detroit, Michigan on the shore of Lake St. Clair (see Figure MI1.0-1). Selfridge ANGB approach control provides air traffic services for aircraft arriving and departing the base. Cleveland Air Route Traffic Control Center (ARTCC) provides approach/departure services when the Selfridge ANGB approach control is closed. Selfridge ANGB lies beneath Class E airspace and their Class D airspace lies partially within Detroit Metropolitan, Wayne County Airport's Class B airspace. The Detroit airport lies approximately 33 miles from Selfridge ANGB. There are several other airports nearby, including

Ray Community, Romeo State, Coleman A. Young Municipal, Oakland/Troy, Windsor, Sarina (in Canada), and St. Clair County International.

The 127 WG currently flies and maintains 18 A-10 and KC-135 aircraft. In 2016, annual airfield operations at Selfridge ANGB totaled 21,612, including 5,098 by the A-10 aircraft. Aircraft based at Selfridge ANGB have flown in this airspace environment for many decades.

MI3.2.1.2 Environmental Consequences

Proposed Action

The one-for-one replacement of A-10 military aircraft with F-35A aircraft assigned to 127 WG would not require changes in local airspace or airfield management. Eventual replacement of A-10 aircraft at the base with F-35As would result in an approximate 32 percent increase in 127 WG airfield operations and an 8 percent increase in total airfield operations when compared to the current No Action conditions (Table MI3.2-1). This minor increase in airfield operations would have a minimal effect on the local air traffic environment. No changes to the Selfridge ANGB terminal airspace arrival or departure procedures or the Class B airspace supporting the Detroit Metropolitan Wayne County Airport would be required to accommodate the F-35A. Therefore, impacts on the local air traffic environment, in the vicinity of the airfield, would not be significant.

Selfridge ANGB	Current	Proposed Airfield Operations
Based A-10	5,098	0
Other Aircraft/Transients ¹	16,514	16,514
F-35A	0	6,746
Total	21,612	23,260
Percent Change from Current	-	+8%

 Table MI3.2-1.
 Comparison of Current and Proposed Airfield Operations

Note: ¹Other aircraft include the based KC-135R, C-12, CASEPF, ASTAR, Bell 222, CH-47F and UH60A operations *Source:* 127 WG 2019.

No Action Alternative

Under the No Action Alternative, the A-10s would continue to fly from Selfridge ANGB. No changes to the frequency of operations, or use of arrival or departure routes, would occur. Operations would remain as described in Section MI3.2.1.1. There would be no change in use of local airspace; therefore, no significant impacts would occur.

MI3.2.2 Airspace

As noted in Chapter 2, Section 2.1.2, F-35A aircraft would not use Military Training Routes, either to access the training airspace or conduct training. Therefore, this aspect of airspace use is not addressed in this EIS.

MI3.2.2.1 Affected Environment

The 127 WG currently uses several airspace units that consist of MOAs, Restricted Areas, and ATCAAs (see Table MI2.2-1 and Figure MI2.2-1). The 127 WG A-10s currently fly in the Pike and Steelhead Airspace Complex that includes Pike East, Pike West and Steelhead MOAs, R-4201A/B and 4207, and the Steelhead, Firebird, Garland, Grayling, Lumberjack, and Molson ATCAAs. In addition to the 127 WG A-10s, the Pike and Steelhead Airspace Complex has transient users that make up about 62 percent of total activity. The 127 WG A-10 aircraft currently conduct up to 2,400 annual sorties (or approximately 200 monthly sorties) lasting between 30-45 minutes in the airspace. The scheduling agency of the Steelhead, Pike West and East MOAs is the Alpena Combat Readiness Training Center. All three MOAs are designated for use from 7 a.m. to 6 p.m. Monday through Saturday, with use at other times by Notice to Airmen (NOTAM). The scheduling agency for R-4201A and R-4201B is Camp Grayling; the designated times of use are from 8 a.m. to 4 p.m. Tuesday through Saturday, with other times by NOTAM. The scheduling agency of R-4207 is the Permanent Field Training Site Detachment, Phelps-Collins ANGB. The controlling agency for all of these SUAs is the FAA, Minneapolis ARTCC. Letters of agreement (LOAs) between the using entities and the FAA define procedures for use of the Steelhead, Firebird, Garland, Grayling, and Lumberjack ATCAAs. The Molson ATCAA lies within the Toronto, Canada, Flight Information Region, and use of the Molson ATCAA requires coordination with Canadian Air Traffic Controllers.

Air Traffic Controllers use Air Traffic Service Routes to direct the flow of air traffic throughout the U.S. and Canada. Table MI3.2-2 identifies the routes through the military training airspace. Victor (V) and Tango (T) routes are low-altitude airways in airspace below 18,000 feet MSL used by Air Traffic Controllers to route air traffic between fixed locations. No V or T routes transit the Steelhead MOA, Pike East MOA, R-4201A/B, or R-4207. Several V routes V-45, V-78, and V-420 flow through the Pike West MOA supporting air traffic into and out of Alpena County Regional Airport; there are no T routes published in the area. V Routes V-300 and V-360 lie beneath the Molson ATCAA. Jet (J) and Q Routes are published airways designated at altitudes between 18,000 feet MSL and 45,000 feet MSL.

Route Name	MEA ¹	Associated Airspace
V-45	None	Pike West MOA
V-78	None	Pike West MOA/ATCAA; Garland ATCAA
V-420	None	Pike West MOA; Grayling/Garland ATCAA ³
V-609	None	Garland/Grayling ATCAA ³
V-233	None	Garland ATCAA ³
V-300	None	Molson ATCAA ²
V-360	None	Molson ATCAA ²
33Q-140	None	Pike East/Grayling/Garland ATCAAs
Q-812	20,000 MSL	Pike East/Steelhead ATCAA
Q-842	None	Steelhead ATCAA ⁴
Q-917	None	Molson ATCAA ²

 Table MI3.2-2. Air Traffic Service Routes in the Vicinity of Training Airspace

Notes: ¹MEA as published in the vicinity of the training airspace. ²Airspace lies partially in Canada. ³Victor and Tango Routes lie beneath the ATCAAs.

⁴Lies within Cleveland ARTCC. *Legend*: MEA = Minimum Enroute Altitude.

There are several public private airports located beneath the MOAs as can be seen in Table MI3.2-3. There are three civilian airports open to the public and one private airport located beneath the Steelhead MOA. In addition, the Class E airspace supporting the Iosco County airport transects the northwest corner of the Steelhead MOA. Seven of the airports that lie beneath the Pike West MOA are publicly owned and open to the public for use. They include the Milwrick Flying M also open for public use but is privately owned and operated. In addition, three private-use airports lie beneath the Pike West MOA. Class E airspace with a floor of 700 feet surrounds Oscoda-Wurtsmith, Iosco County, and Alpena County Regional Airports. There are no civilian airports located beneath R-4201A/B, Pike East MOA, or R-4207, which are located entirely over water. Several airports lie beneath the Garland, Grayling, and Molson ATCAAs, including the Gaylord Regional Airport, Cheboygan County Airport, Pellstone Regional of Emmett County in the U.S. and the Yacht Haven, Ashman Island, Drummond Island, St. Joseph Island (Private) and Franklins (Private) in Canada. Airports lying beneath ATCAA-only airspace are not analyzed in detail as arrivals and departures to these airports would be below 18,000 feet MSL and no impacts would be expected.

Airport Name	Airport Ownership	Associated MOA	Based Aircraft	Annual Operations	
Huron County Memorial	Public	Steelhead MOA	16 – Single Engine 1 – Jet	9,700	
Sebewaing Airport	Public	Steelhead MOA	5 – Single Engine	2,000	
Iosco County Airport	Public	Pike West MOA	22 – Single Engine 1 – Multi-Engine	3,234	
Oscoda-Wurtsmith	Public	Pike West MOA	21 – Single Engine 8 – Jet 1 – Helicopter 1 – Glider	5,530	
Alpena County Regional Airport	Public	Pike West MOA	12 – Single Engine 6 – Multi-Engine 1 – Helicopter 1 – Military	5,9021	
Presque Isle County	Public	Pike West MOA	5 – Single Engine	950	
Hillman Airport	Public	Pike West MOA	4 – Single Engine	1,412	
Field of Dreams Airport (H80) ²	Private	Pike West MOA	None Reported	50	
Milwrick Flying M ²	Private	Pike West MOA	None Reported	100	
Indian Creek Ranch ²	Private	Steelhead MOA	None Reported	50	
Cub Landing Center Airport	Private	Pike West MOA	None Reported	Not Reported	
Silver City Airpark Airport	Private	Pike West MOA	1 – Single Engine	150	
Vlachos Acres	Private	Pike West MOA	None Reported	Not Reported	

Table MI3.2-3.	Public and Private Airports in the Vicinity of the Special Use Training
	Airspace

Notes: ¹Includes 2,581 military operations. ²Open to the public. *Legend*: MOA = Military Operations Area.

Source: Skyvector 2018.

MI3.2.2.2	Environmental	Consequences
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Proposed Action

Selection of the 127 WG for beddown of 18 F-35A operational aircraft would be expected to result in minimal impacts on airspace use and management throughout this region. The Proposed Action Alternative would not require any changes to the current lateral or vertical configuration of the MOAs, Restricted Areas, or ATCAAs, nor would it alter their normally scheduled times of use. Under the Proposed Action, the F-35A aircraft would conduct up to 3,061 annual sorties (approximately 250 monthly sorties) lasting 30-60 minutes each. Based on this, the time spent in the airspace by the 127 WG would increase by approximately 54 percent from the affected environment (see Table MI2.2-3). The existing coordination requirements for use of the airspace would remain in effect and the 127 WG would continue to be required to contact the Alpena Combat Readiness Training Center and Camp Grayling to schedule and use SUA. Operations in ATCAAs would continue only when released for military use by the Minneapolis ARTCC or Toronto Flight Information Center. Impacts to civil and commercial aviation traffic in 127 WG training areas would be expected to increase from what it is today due to increases in military flight operations. The FAA would continue to support air traffic into and out of Alpena County Regional Airport. Civilian pilots using existing routes, V-45, V-78, and V-420 that flow through the Pike West MOA would need to remain vigilant of military aircraft training in the area and continue to fly using see-and-avoid flight rules when the MOAs are active. Pilots flying Instrument Flight Rules (IFR) would continue to be managed by Air Traffic Controllers and may experience additional routing around the MOA. Impacts to the traffic on the high altitude routes Q-140, Q-812 and Q-842 that traverse above the MOA airspace, is expected to be minimal. These routes are within positive control airspace (over 18,000 feet MSL) released by the FAA for military training only when not needed for other air traffic purposes.

Close coordination of scheduling and use of the MOAs, Restricted Areas, and ATCAAs by the 127 WG with the scheduling agencies (i.e., Alpena Combat Readiness Training Center, Camp Grayling, and Permanent Field Training Site Detachment), Minneapolis ARTCC and Toronto Flight Information Center would continue to ensure safe air traffic operations throughout the region. Other air traffic traveling near these airspace units would not be in conflict with military flight activities. In addition, the F-35A would conduct a greater percentage of training at higher altitudes than the A-10s. The Proposed Action Alternative represents a continuation of current activities with increases only in operations, and no comments were received during the public scoping period revealing conflicts with civil or commercial aviation. Therefore, impacts to airspace use and management would not be significant.

No Action Alternative

Under the No Action Alternative, the 127 WG A-10s would continue to fly from Selfridge ANGB and use the same training airspace as they do today. No changes to the number of operations or frequency of use of the training airspace would occur. Operations would remain as described in Section MI3.2.1.1. There would be no change in use of training airspace and therefore, no significant impacts would occur.

MI3.2.3 Summary of Impacts

The one-for-one replacement of A-10 military aircraft with F-35A aircraft assigned to 127 WG would not require changes in local airspace or airfield management. Eventual replacement of A-10 aircraft at the base with F-35As would result in 32 percent increase in 127 WG operations, and an approximate 8 percent (five airfield operations per average annual day) increase in airfield operations when compared to the affected environment. This minor increase in airfield operations would have a minimal effect on the local air traffic environment. Time spent in the SUA would be expected to increase up to approximately 54 percent. No changes to the Selfridge ANGB

terminal airspace arrival or departure procedures or the Class B airspace supporting the Detroit Metropolitan Wayne County Airport would be required to accommodate the F-35A. Close coordination of scheduling and use of the SUA by the 127 WG with the scheduling agencies would continue to ensure safe air traffic operations throughout the region. Therefore, impacts to airspace around Selfridge ANGB and the SUA associated with the 127 WG would not be significant as a result of the F-35A beddown.

MI3.3 AIR QUALITY

MI3.3.1 Installation

The following section describes the affected environment and examines the extent to which the beddown of the F-35A at the 127 WG installation would be consistent with federal, state, and local air quality regulations.

Affected Environment MI3.3.1.1

The affected environment for the air quality analysis is Macomb County, Michigan, which is part of the Metropolitan Detroit-Port Huron Intrastate Air Quality Control Region (AQCR) (40 CFR 81.37). Macomb County is in nonattainment for the 2015 ozone standard and is a designated maintenance area for CO and PM2.5. Because the General Conformity Rule applies to relevant activities at the 127 WG, a General Conformity Applicability Analysis has been included in the air quality analysis performed for this location.

Table MI3.3-1 presents the 2014 emission inventory for Macomb County, which includes Selfridge ANGB.

Table MI3.3-1. 2014 Criteria Pollutant Emissions for Macomb County, Michigan (tons/year)

Location	VOCs	NOx	СО	SO ₂	PM 10	PM _{2.5}			
Macomb County, MI	24,221	16,444	98,671	834	5,354	2,651			

Legend: CO = carbon monoxide; $NO_x =$ nitrogen oxides; $SO_2 =$ sulfur dioxide; $PM_{2.5} =$ particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.

Source: USEPA 2018a.

In the Macomb County, Michigan region, the summers are warm, the winters are cold and windy, and it is partly cloudy year round. Over the course of the year, the temperature typically varies from 20 degrees Fahrenheit (°F) to 83°F and is rarely below 6°F or above 91°F. Rain falls throughout the year in Macomb County. The most rain falls during the 31 days centered around June 2, with an average total accumulation of 2.7 inches during this period. The snowy period of the year lasts for 4.4 months, from November 24 to April 7. The most snow falls during the 31 days centered around February 14, with an average snowfall of approximately 5 inches during this period (Weather Spark 2018).

Over the last half century, average annual precipitation in most of the Midwest has increased by 5 to 10 percent. Rainfall during the four wettest days of the year has increased about 35 percent. Most of the state has warmed 2 to 3°F in the last century. Higher temperatures increase the formation of ground level ozone, a pollutant that causes lung and heart problems. USEPA and the EGLE have been working to reduce ozone concentrations (USEPA 2016).

Airfield operations are performed by the 127 WG, which currently flies 18 A-10C aircraft. For the air quality analysis, only the aircraft to be replaced have been analyzed, as all other aircraft and their activities would remain the same. The annual operations for the aircraft include 2,388 landings and take-offs and 322 closed pattern operations. Other sources of air emissions associated with aircraft operations include airfield equipment such as tow tractors, and aircraft engine testing. Table MI3.3-2 presents the annual A-10C emissions for the 127 WG. Emission estimates were developed for the aircraft using the TF34-GE-100 engines. Emission estimates were derived manually using installation-specific data and include landings and take-offs, closed patterns, and annual aircraft engine testing. A-10 aircraft emissions are based on operations data provided by the installation, and represent the most recent data available on flight operations. Aerospace Ground Equipment (AGE) operations emissions estimates were derived from the USAF's Air Conformity Applicability Model (ACAM), where a number of default values were used.

Table MI3.3-2. Annual A-10 Emissions Estimates for the 127 WG at Selfridge ANGB
(tons/year)

		(
Emission Source	VOCs	NO _x	СО	SO_2	PM ₁₀	PM _{2.5}	CO ₂ e
A-10C Operations	98.08	72.48	226.53	5.41	23.61	14.92	8881
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Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; SO_2 = sulfur dioxide; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.

MI3.3.1.2 Environmental Consequences

Proposed Action

Air quality impacts within the affected environment were reviewed relative to federal, state, and local air pollution standards and regulations. Refer to Section 3.4 for a detailed discussion of air quality resource definitions and the analytical methodology for evaluating impacts. Macomb County is a designated maintenance area for PM_{2.5} and nonattainment for ozone (USEPA 2018b). A portion of Macomb County is also designated as a maintenance area for CO, but none of the activities occur in this area, and so CO is not included in the General Conformity analysis. For purposes of the analysis of PM_{2.5}, the PM_{2.5} precursor sulfur dioxide (SO₂), and the ozone precursors volatile organic compounds (VOCs) and nitrogen oxides (NO_x), 100 tons per year per pollutant was used as the General Conformity Rule *de minimis* threshold for each pollutant to assess the applicability of General Conformity to the Proposed Action. For the remaining criteria pollutants, potential impacts to air quality are evaluated with respect to the extent, context, and

intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the USEPA's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 tons per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant, the indication is the air quality impacts will be insignificant for that pollutant. In the case of criteria pollutants for which the proposed project region does not attain a NAAQS, the analysis compares the net increase in annual direct and indirect emissions to the applicable pollutant de minimis threshold(s). If the net direct and indirect emissions from the project alternative equal or exceed an applicable de minimis threshold, then a positive general conformity determination is required before any emissions from the actions may occur.

Construction

As a result of the proposed construction, there would be up to 104,000 SF (2.4 acres) of new construction footprint, including up to 59,400 SF (1.4 acre) of new impervious surface. All proposed construction would be within the footprint of the developed installation. The calculations have been performed to account for each construction project being completed, even though some projects would last longer than 12 months. This is to ensure a worst-case emissions scenario is captured. The following assumptions were used for construction projects at the 127 WG installation:

- New building foundations require excavation of at least 1 foot of grade soil.
- Airfield pavements require excavation of at least 3 feet of grade soil.
- All buildings are single story.
- All new buildings require at least 100 feet of utility trenching.
- All new impervious surfaces are assumed to be concrete.

- All construction activities were assumed to be completed in 1 year to provide a worst-case scenario for emissions. This means all construction was calculated to occur in 2020, even though some projects may last longer than 1 year.
- Where two options are under consideration, the option that would generate the greatest emissions was selected for analysis.

Construction emission estimates were prepared using the USAF air model ACAM. Emissions would primarily be generated by:

- diesel-powered construction equipment operating on-site,
- trucks removing or delivering materials from the construction areas,
- construction worker vehicles,
- application of architectural coatings, and
- dust created by grading and other bare earth construction activities.

Results of the modeling are presented in Table MI3.3-3. The 100-ton per year value serves as the *de minimis* threshold for VOC, NO_x , sulfur oxides (SO_x), and PM_{2.5}. To provide clarity, the values specifically evaluated for the General Conformity Applicability Analysis are bolded. Detailed information on the modeling can be found in Appendix C.

Table MI3.3-3. Annual Construction Emissions Estimates for the127 WG Installation – 2019 (tons/year)

	==				/		
Year	VOC	NO _x	СО	SO_x	PM ₁₀	PM _{2.5}	CO ₂ e
2019	2.86	3.33	3.09	0.01	0.73	0.16	687
<i>De Minimis</i> Threshold/							
Comparative Indicator	100	100	250	100	250	100	NA
Exceedance (Yes/No)	No	No	No	No	No	No	NA

Legend: $CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM_{2.5} = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.$

Based on the calculations, the emissions associated with the construction necessary to prepare the 127 WG installation for the beddown of the F-35A would not exceed the *de minimis* thresholds for VOCs, NO_x , SO_x , or $PM_{2.5}$. Because the emission results do not exceed the thresholds, the General Conformity Applicability Analysis for construction is complete and the construction activities as described are exempt from the General Conformity Regulations. Additionally, the particulate matter less than or equal to 10 microns in diameter (PM_{10}) emissions are below the comparative indicator values. The emissions associated with the construction necessary for beddown of the F-35A at Selfridge ANGB would be minimal. A Record of Conformity Applicability is included in Appendix C as a record demonstrating that General Conformity does not apply to the Proposed Action. In addition, a Record of Air Analysis (ROAA) has been prepared to document that the CO and PM_{10} construction emissions would be minimal, and can also be found in Appendix C.

Airfield Operations

Airfield operations for the 18 F-35A would be similar to those currently occurring with the A-10C at the 127 WG. The primary differences would be that the annual number of landings and take-offs is projected to increase by 673 and the closed pattern operations are expected to increase by 302, resulting in an overall increase in operations. The net change in operational emissions at the 127 WG installation are presented in Table MI3.3-4 for 2024, when all 18 F-35A aircraft would be onsite and operational. This would represent the new emission profile moving forward. The emissions account for the difference in the engine operations between the A-10C and F-35A aircraft, the increase in annual operations, and an increase in 85 commuting personnel who would be assigned to the 127 WG installation as a result of beddown of the F-35A at the installation.

Emissions Source	VOC	NO_x	СО	SO_x	PM_{10}	PM _{2.5}	CO_2e	
F-35A Operations	6.05	75.78	22.19	15.30	2.43	2.32	22,482	
A-10C Operations	98.08	72.48	226.53	5.41	23.61	14.92	8881	
Net Change	-92.03	3.30	-204.34	9.89	-21.18	-12.60	13,601	
De Minimis Threshold /								
Comparative Indicator	100	100	250	100	250	100	NA	
Exceedance (Yes/No)	No	No	No	No	No	No	NA	

Table MI3.3-4. Annual Airfield Emissions Estimates for 127 WG – 2025 (tons/year)

Legend: CO = carbon monoxide; CO_2e = carbon dioxide equivalent; NO_x = nitrogen oxides; SO_x = sulfur oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; VOC = volatile organic compound.

The net change is the difference in emissions resulting from instituting the Proposed Action to base the F-35A as compared to not introducing the action.

Based on the ACAM calculations, the F-35A operational emissions associated with the 127 WG installation would not exceed the *de minimis* thresholds for the criteria pollutant PM_{2.5} or its precursor SO₂. Additionally, the emissions of the ozone precursors VOCs and NO_x would not exceed the thresholds. All criteria pollutant and precursor emissions would decrease as a result of the transition with the exception of NO_x and SO_x, which would slightly increase. Because the VOCs, NO_x, SO_x, and PM_{2.5} emission results would not exceed the *de minimis* thresholds, the General Conformity Applicability Analysis for airfield operations is complete and these activities as described would be exempt from the General Conformity Regulations.

All of the criteria pollutant emissions associated with the beddown of the F-35A at Selfridge ANGB would be minimal and there would be no significant impacts on area air quality. A Record of Conformity Applicability is included in Appendix C as a record demonstrating that General Conformity does not apply to the Proposed Action. In addition, a ROAA has been prepared to document that the CO and PM_{10} airfield operation emissions would be minimal, and can also be found in Appendix C.

Greenhouse Gas Emissions

The proposed construction activities would contribute directly to greenhouse gas (GHG) emissions from fossil fuels. Demolition and construction activities would generate 686 tons of carbon dioxide equivalents (CO_2e) emissions for 2020. To put these emissions in perspective, 686 tons of GHGs is the equivalent of 134 cars driving the national average of 11,500 miles per year (USEPA 2018b). These GHG emissions would only be generated during the construction period. The operation of new facilities may result in a small increase in installation-related GHG emissions, primarily through the consumption of electricity and possibly through the combustion of fossil fuel on-site if any oil or natural gas boilers or other heating units are installed in the new facilities.

GHG emissions from airfield operations are based on the same mobile sources as the criteria pollutants: aircraft flight operations at the airfield, AGE, and jet engine testing. For the proposed F-35A beddown, additional commuter emissions are included because of an increase in personnel. The annual airfield CO_2e emissions would increase by approximately 13,601 tons. This is equivalent to adding an additional 2,658 passenger vehicles onto roads, driving 11,500 miles per year on average.

While the GHG emissions generated from the construction and F-35A airfield operations alone would not be enough to cause global warming, in combination with past and future emissions from all other sources they would contribute incrementally to the global warming that produces the adverse effects of climate change.

No Action Alternative

Under the No Action Alternative, the transition of A-10C aircraft to F-35A aircraft would not occur. There would be no construction nor alterations to the 127 WG installation in support of the F-35A beddown. Air emissions would not be notably different from those that occur today and as such would not be significant.

MI3.3.2 Airspace

MI3.3.2.1 Affected Environment

The affected environment is the airspace units that are used by the 127 WG that consist of Pike East, Pike West and Steelhead MOAs, R-4201A/B and 4207, and the Steelhead, Firebird, Garland, Grayling, Lumberjack, and Molson ATCAAs (see Table MI2.2-1 and Figure MI2.2-1). The A-10Cs currently fly approximately 19 percent of the time below 3,000 feet above ground level (AGL) in the SUA, which is below the mixing height and where emissions from the flying aircraft

can influence ground-level air quality. None of the areas are designated by USEPA as nonattainment or maintenance areas for criteria pollutants.

MI3.3.2.2 Environmental Consequences

Proposed Action

Generally, the F-35A would fly more often at higher altitudes, operating at 3,000 feet AGL or higher about 99 percent of the flight time. This would be an 18 percent decrease in flight below the mixing height compared to the legacy A-10C aircraft. No new airspace or airspace reconfigurations are proposed, or would be required to support the F-35A beddown at the 127 WG installation. The overall impact on air quality as a result of F-35A flight in the airspace would be slightly beneficial, with fewer air pollutant emissions below the mixing height. As a result, there would be no significant impacts to air quality in the airspace as a result of the Proposed Action.

GHG emissions that occur both below and above the mixing height contribute to climate change. Aircraft training activities in the airspaces are highly variable, and it is not possible to quantitatively analyze the current or Proposed Action GHG emissions in airspace. GHG emissions would increase both due to the fact that the F-35A consumes more fuel that the A-10 when performing the same operations, and that the annual operations would increase.

No Action Alternative

Under the No Action Alternative, the transition of A-10C aircraft to F-35A aircraft would not occur and the A-10C would continue to operate from the 127 WG installation. Airspace activities would not be notably different from those that occur today, and as such, impacts would not be significant.

MI3.3.3 Summary of Impacts

Though Macomb County is designated a nonattainment area for ozone, and a maintenance area for CO and PM_{2.5}, emissions as a result of both construction activities and aircraft operations under the proposed F-35A beddown at Selfridge ANGB would not be anticipated to exceed *de minimis* thresholds for these pollutants, their precursors, or any of the criteria pollutants. There would be an anticipated decrease of 18 percent for operations below the mixing height in the SUA, which would be a minor positive impact. Impacts to air quality associated with the proposed beddown of the F-35A at Selfridge ANGB would not be significant.

MI3.4 SAFETY

MI3.4.1 Installation

MI3.4.1.1 Affected Environment

Fire/Crash Response

Day-to-day operations and maintenance activities conducted by the 127 WG are performed in accordance with applicable USAF safety regulations, published USAF Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. The 127 WG provides fire, crash, rescue, and structural fire protection for the installation and its aircraft. The 127 WG fire department has mutual aid agreements with local agencies for aid in fire protection, first responder and lifesaving services, and hazardous materials incident response. The 127 WG adheres to specific emergency-response procedures contained in the Technical Order 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information*, for aircraft mishaps involving composite materials (USAF 2018). Specifically, Technical Order 00-105E-9 contains a section (Chapter 3) on Mishap Composite Awareness that provides guidance on fire response to aircraft containing composite materials.

Accident Potential Zone

Clear Zones (CZs) and Accident Potential Zones (APZs) are rectangular zones extending outward from the ends of active runways at military airfields and delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during take-off or landing (Figure MI3.4-1). Development restrictions associated with APZs are intended to preclude incompatible land use activities from being established in these areas (see Section 3.5.1.1 for specific APZ discussion and Section 3.6.1 for land use compatibilities). The USAF provides an AICUZ study to local communities to assist them in preparing local land use plans. The USAF is interested in minimizing incompatible land uses because of the potential for this type of development to result in restrictions being placed on flying operations. The CZ (3,000 feet by 3,000 feet) at the end of runway has the highest potential for aircraft accidents, which is why development of any kind is restricted in this area. When there is existing development in the CZ, the USAF strives to acquire the property through fee-simple acquisition or restrictive easements.

United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



Selfridge ANGB has taken several proactive steps to limit incompatible development in its northern and southern CZs. Selfridge ANGB owns the majority of the land in the northern CZ and has purchased easements in the remainder of the land that prevent incompatible development. In the southern CZ, the majority of the area south of the Clinton River has been developed as single-family residential for several decades (Figure MI3.4-1 inset). This residential area has been excluded from eminent domain acquisition per a 1979 Secretary of the Air Force memo, but no waiver exists or is allowed for this CZ encroachment. This is a significant encroachment issue and does not conform to USAF CZ policy (UFC 3-260-091, *Airfield and Heliport Planning and Design*). Possible mitigation to this encroachment may be considered in an upcoming Joint Land Use Study with the Department of Defense Office of Economic Adjustment. Normal operational procedures at Selfridge ANGB are to depart to the north roughly 90 percent of the time, and arrive from the north 90 percent of the time, thereby minimizing the number of aircraft operations over the residential property to the extent practicable.

Explosive Safety

The 127 WG stores, maintains, and uses munitions required for performance of their mission. The Munitions Storage Area (MSA) at Selfridge ANGB currently has 10 facilities: B898 Admin and Trailer Maintenance facility, B873 and B874 Maintenance and Inspection, B899 Earth Covered Magazines, B892, B893, B894, and B895 Aboveground Magazines (multi-cubes), B887 and B896 Inert Storage and an Open Training/Operational Munitions Assembly Conveyor Pad. Facilities meet all safety and mission requirements. Figure MI3.4-2 shows the quantity-distance (QD) arcs associated with these facilities.

Anti-terrorism/Force Protection

Many of the military facilities at the 127 WG installation were constructed before Anti-terrorism/Force Protection (AT/FP) considerations became a critical concern. Thus, many facilities currently do not comply with all current AT/FP standards. However, as new construction occurs and as facilities are modified, the 127 WG would incorporate these standards to the maximum extent practicable.

MI3.4.1.2 Environmental Consequences

Proposed Action

Existing facilities at Selfridge ANGB for fire response and crash recovery meet F-35A beddown requirements (ANG n.d.).



Providing new and renovated facilities for the 127 WG that support operational requirements of the F-35A, and are properly sited with adequate space and a modernized supporting infrastructure would generally enhance ground and flight safety during required operations, training, maintenance and support procedures, security functions, and other activities conducted by the 127 WG.

Proposed renovation and infrastructure improvement projects related to this alternative would not impact aircraft take-off and landings or penetrate any APZs. New building construction is not proposed within APZs; however, a BAK 12/14 arresting system would be added to the primary runway within the Clear Zone. The system is embedded in the surface and once installed, would not interfere with operations, nor be considered a safety hazard. Therefore, construction activity would not result in any greater safety risk or obstructions to navigation. Operations would fall within the same general types as those that have historically occurred at Selfridge ANGB. For example, the F-35A would follow established local approach and departure patterns used. Therefore, flight activity and subsequent operations would not require changes to APZs.

The QD arcs would not change under the Proposed Action. While there are a few planned construction projects within the QD arcs, per Air Force Manual 91-201, *Explosive Safety Standards*, all public traffic route distances (PTRDs) and inhabited building distances (IBDs) meet specified net explosive weight quantity-distance (NEWQD) criteria (Figure MI3.4-3). No explosives would be handled during construction or demolition activities. Therefore, no additional risk would be expected as a result of implementation of this alternative.

The proposed construction projects meet all criteria specified in the ANG Handbook 32-1084, *Facility Space Standards*. AT/FP requirements have also been addressed to the extent practicable in all projects. Projects would use AT/FP site design standards for siting of facilities, parking, walkways, and other features. Renovations would bring the facilities into compliance with UFC 4-022-01, *Security Engineering: Entry Control Facilities/Access Control Points* and UFC 4-010-01, *DoD Minimum Anti-terrorism Standards for Buildings*, providing additional protection for the personnel based there.



Chapter 3, Section 3.5.1.1 details F-35A composite material characteristics and potential exposure risks. Under the Proposed Action, firefighters would continue to be fully trained and appropriately equipped for crash and rescue response involving advanced aerospace composite materials and the proposed 127 WG F-35A beddown would not change these abilities. Additionally, 127 WG would keep local firefighting departments informed about any new information or firefighting techniques associated with composite materials should an accident occur. Based on current information on the characteristics of burning composite materials, standard firefighting equipment, including self-contained breathing apparatus, should be adequate to protect firefighters (Air Force Research Laboratory 2015; Naval Air Warfare Center 2003). No special extinguishing agents are needed for composite materials and typical aircraft firefighting agents, such as water or aqueous film forming foam, are adequate to control burning composite materials during an aircraft mishap. In the event of a crash of an aircraft containing composite materials, the USAF would follow the guidance contained in the *Mishap Response Checklist for Advanced Aerospace Materials/Composites* (USAF Advanced Composites Program Office 1993).

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 127 WG installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. All aspects of ground and flight safety would be expected to remain as described under affected environment in Section MI3.4.1.1. Therefore, there would be no significant impacts to safety under the No Action Alternative.

MI3.4.2 Airspace

MI3.4.2.1 Affected Environment

The airspace directly associated with the Proposed Action as it relates to the 127 WG includes Restricted Areas, MOAs, and ATCAAs (see Figure MI2.2-1). The volume of airspace encompassed by the combination of airspace elements constitutes the affected environment for airspace management. These training areas allow military flight operations to occur and minimize exposure to civil aviation users, military aircrews, or the general public to hazards associated with military training and operations. This section describes the existing operations within the training airspace units and the following section evaluates changes that would occur with the introduction of the F-35A.

Flight Safety Procedures

Aircraft flight operations from Selfridge ANGB are governed by standard flight rules. Specific safety requirements are contained in standard operating procedures that must be followed by all aircrews operating from the airfield (AFI 11-2A/OA-10V1, *A/OA-10 Aircrew Training*, 2006; AFI 11-2KC-135V3, *KC-135 Operations Procedures*, 2013) to ensure flight safety.

Aircraft Mishaps

A-10 aircraft have flown more than 5,652,298 hours since the aircraft entered the USAF inventory in 1972. Over that period, 106 Class A mishaps have occurred and 106 aircraft have been destroyed. This results in a Class A mishap rate of 1.88 per 100,000 flight hours, and an aircraft destroyed rate of 1.88 per 100,000 flight hours (Air Force Safety Center [AFSEC] 2019a). The C-135 (all models) have flown more than 16,121,776 hours since the aircraft entered the USAF inventory in 1957. Over that period, 87 Class A mishaps have occurred and 65 aircraft have been destroyed. This results in a Class A mishap rate of 0.54 per 100,000 flight hours, and an aircraft destroyed rate of 0.40 per 100,000 flight hours (AFSEC 2019b). The 127 WG has not experienced a Class A mishap in the past 5 years (127 WG 2017a).

Bird/Wildlife Aircraft Strike Hazard

The USAF Bird/Wildlife Aircraft Strike Hazard (BASH) Team maintains a database that documents all reported bird/wildlife aircraft strikes. Historic information for the past 43 years indicates that for the entire USAF, 16 USAF aircraft have been destroyed and 29 fatalities have occurred from bird/wildlife aircraft strikes (AFSEC 2017a).

The 127 WG has an ongoing BASH program through which information and assistance is freely shared between the Selfridge ANGB staff and the local Air Traffic Controllers. Serious BASH-related accidents within the immediate Selfridge ANGB area are unusual and have never resulted in a Class A mishap (127 WG 2017a). The 127 WG has recorded 81 minor BASH incidents to both A-10 and KC-135 aircraft from 2012 to 2017 (127 WG 2017a).

Fuel Jettison

For use in emergency situations, certain aircraft have the capability to jettison fuel and reduce aircraft gross weight for flight safety. When circumstances require, fuel jettisoning is permitted above 5,000 feet AGL, over unpopulated areas, and is generally over water for applicable bases. AFIs cover the fuel jettison procedures, and local operating policies define specific fuel ejection areas for each base. The A-10 does not have fuel jettison capability.

MI3.4.2.2 Environmental Consequences

Proposed Action

The F-35A is a new aircraft and historical trends show that mishaps of all types decrease the longer an aircraft is operational as flight crews and maintenance personnel learn more about the aircraft's capabilities and limitations. As the F-35A becomes more operationally mature, the aircraft mishap rate is expected to become comparable with a similarly sized aircraft with a similar mission, as discussed in Section 3.4. F-35A has improved electronics and maintenance; thus, they are expected to result in long-term Class A accident rate comparable to that of the similarly sized F-16 aircraft (3.35 lifetime) (AFSEC 2019c).

Through Fiscal Year (FY) 2019, the F-35A has amassed 96,313 flying hours with three Class A mishaps resulting in no injuries and a Class A mishap rate of 3.11 lifetime, and for the last 5 years of 2.17 (AFSEC 2019d). These statistics are updated annually. Because the F-35A has not yet reached 100,000 hours by the end of FY 2019, this rate is not directly comparable to other aircraft with more flying hours. However, this rate does provide some indication of the overall safety of the F-35A aircraft. For example, this rate is much lower than the 18.65 rate that the F-16 had in the past after a comparable amount of hours.

In order to provide a broader perspective on the potential mishap rate for a new technology like the F-35A, the following discussion refers to the mishap rates for the introduction of the F-22A (Raptor), the latest jet fighter in the Department of Defense (DoD) inventory. The F-22A was introduced in 2002, and provided the USAF with the most current engine and stealth capabilities. This new technology is akin to the F-35A in that it is a new airframe with similar flight capabilities. With that in mind, it is possible that projected mishap rates for the F-35A may be comparable to the historical rates of the F-22A. The Class A mishap rates for the F-22A from squadron operational status through 2019 are provided in Table MI3.4-1.

Year	Class A Number of Mishaps	Class A Rate ¹	Destroyed A/C	Destroyed Rate	Fatal Pilot	Fatal All	Hours Flown per Year	Cumulative Flight Hours
FY02	1	0.00	0	0.00	0	0	0	0
FY03	0	0.00	0	0.00	0	0	133	133
FY04	1	32.12	0	0.00	0	0	3,113	3,246
FY05	1	24.90	1	24.90	0	0	4,016	7,262
FY06	1	11.10	0	0.00	0	0	9,012	16,274
FY07	0	0.00	0	0.00	0	0	14,487	30,761
FY08	1	5.56	0	0.00	0	0	17,977	48,738
FY09	1	4.76	1	4.76	0	1	20,988	69,726
FY10	0	0.00	0	0.00	0	0	24,675	94,401
FY11	1	6.54	1	6.54	1	1	15,289	109,690
FY12	3	11.32	0	0.00	0	0	26,506	136,196
FY13	1	3.82	1	3.82	0	0	26,184	162,380
FY14	1	3.34	0	0.00	0	0	29,939	192,319
FY15	1	3.13	0	0.00	0	0	31,993	224,312
FY16	1	3.24	0	0.00	0	0	30,889	255,201
FY17	1	2.96	0	0.00	0	0	33,834	289,035
FY18	5	13.01	0	0.00	0	0	38,424	327,458
FY19	6	21.48	0	0.00	0	0	27,932	355,390
Lifetime	26	7.32	4	1.13	1	2	-	355,390

Table MI.3.4-1. F-22A Class A Flight Mishap History

Note: ¹Mishap rate is based on 100,000 hours of flight. *Legend:* A/C = aircraft.

Source: AFSEC 2019e.

Since introduction of the single jet engine fighter or attack aircraft in the 1950s, technological advances have continually driven down the engine failure rate and associated aircraft mishaps (Figure MI3.4-4) (AFSEC 2017b).

Although the F-35A is a new aircraft, the single engine that powers it is a composite product of 30 years of engineering, lessons learned from previous single aircraft engines with a similar core, and tens of thousands of hours during operational use of legacy aircraft. The propulsion system design for the F-35A includes a dedicated system safety program with an acceptable risk level that was more stringent than legacy engines. The engine safety program focused on the major contributors of what previously caused the loss of an aircraft and provided redundancies in case of control system failures; additionally, the program allowed for safe recovery of the aircraft even with system failures. Throughout the design and testing process, safety initiatives took previous best practices for single engine safety and built upon them to promote flight safety progress. Examples of design characteristics that are damage tolerant and enhance safety include a dual wall engine liner, a fan blade containment shell, and a shaft monitor for vibration, torque, and alignment.



 Figure MI3.4-4.
 USAF Engine-Related Mishap Rates

 Note:
 "Engine-related" excludes mishaps caused by foreign object damage, BASH, or failure of support systems external to the engine (e.g., fuel starvation).

 Source:
 AFSEC 2017b.

Additionally, pilots flying the F-35A would use simulators extensively. Simulator training includes all facets of flight operations and comprehensive emergency procedures. The sophistication and fidelity of current simulators and related computer programs are commensurate with the advancements made in aircraft technology. These factors should minimize risk associated with mishaps due to pilot error.

Due to the addition of the F-35A aircraft under the Proposed Action at Selfridge ANGB, there would be an increase of approximately 8 percent in total airfield operations compared to the affected environment (see Table MI2.1-1). Under this scenario, the increase in take-offs, landings, proficiency training, and other flights would result in a commensurate increase in the safety risk to aircrews, personnel, and residences within the CZ. This increase in airfield operations would also increase the risk of an aircraft accident occurring in the residential area located in the CZ; however, continuing to minimize flight operations over the housing area through runway use as is currently done, combined with the technological advances that have continually driven down the engine failure rate and associated aircraft mishaps would be expected to offset any increase in risk. All current airfield safety procedures discussed previously would continue to be implemented and

additional airfield flight operations would adhere to established safety procedures described in Section 3.5.1.

The F-35A would operate in the same airspace environment that the 127 WG A-10 aircraft currently operate. As such, the overall potential for bird aircraft strikes would not be anticipated to be statistically different following the beddown of the F-35A. However, the F-35A is considered to be more vulnerable to a catastrophic wildlife strike due to the Electro-Optical Targeting System (EOTS) Window Assembly than the legacy aircraft. Damage to the EOTS due to a wildlife strike could damage the engine, which could result in the catastrophic loss of the aircraft. Airfield encroachment issues currently at Selfridge ANGB may place people and dwellings in harm's way if wildlife shatters the EOTS leading to engine ingestion during aircraft launch and recovery. It is anticipated that BASH potential would be somewhat lessened because the F-35A attains altitude more rapidly and would spend less time than A-10 aircraft at lower altitudes where species generally fly. In addition, F-35A aircrews operating in the Selfridge ANGB associated training airspace would be required to follow applicable procedures outlined in the 127 WG BASH Plan; adherence to this program has minimized bird aircraft strikes. When risk increases, limits are placed on low-altitude flights and some types of training (e.g., multiple approaches, closed pattern work). Furthermore, special briefings are provided to pilots whenever the potential exists for greater bird strike risks within the airspace; F-35A pilots would also be subject to these procedures.

Chapter 3, Section 3.5.1.1 details F-35A composite material characteristics and potential exposure risks. Under the Proposed Action, firefighters would continue to be fully trained and appropriately equipped for crash and rescue response involving advanced aerospace composite materials and the proposed 127 WG F-35A beddown would not change these abilities. Additionally, 127 WG would keep local firefighting departments informed about any new information or firefighting techniques associated with composite materials should an accident occur. Based on current information on the characteristics of burning composite materials, standard firefighting equipment, including self-contained breathing apparatus, should be adequate to protect firefighters (Air Force Research Laboratory 2015; Naval Air Warfare Center 2003). No special extinguishing agents are needed for composite materials and typical aircraft firefighting agents, such as water or aqueous film forming foam, are adequate to control burning composite materials during an aircraft mishap. In the event of a crash of an aircraft containing composite materials, the USAF would follow the guidance contained in the *Mishap Response Checklist for Advanced Aerospace Materials/Composites* (USAF Advanced Composites Program Office 1993).

The only maintenance of the stealth coating (e.g., low observable material) that would be accomplished at the base would be done using a brush or roller to apply coatings, bonding materials, or applying tape. Depot-level maintenance of the low observable material (including spray capability) would be conducted off-site, and therefore the composite material for major repairs to the low observable material would not be stored on base.

The F-35A does have the capability to jettison fuel for emergency situations. When circumstances require, fuel jettisoning is permitted above 5,000 feet AGL, over unpopulated areas, and is generally over water for applicable bases. AFIs cover the fuel jettison procedures, and local operating policies define specific fuel ejection areas for each base. In 2001, the USEPA National Vehicle and Fuel Emissions Laboratory concluded, "Since fuel dumping is a rare event, and the fuel would likely be dispersed over a very large area, we believe its impact to the environment would not be serious" (USEPA 2001).

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing aircraft. All aspects of safety would remain as described in the affected environment in Section MI3.4.2.1. Therefore, there would be no significant impacts to safety as a result of the No Action Alternative.

MI3.4.3 Summary of Impacts

Construction activities would not pose any unusual concerns, and standard construction safety procedures would be implemented. All new construction would implement AT/FP requirements. QD arcs would not be anticipated to change from the affected environment. While there are a few planned construction projects within the QD arcs, per Air Force Manual 91-201, Explosive Safety Standards, all PTRDs and IBDs meet specified NEWQD criteria. Though the F-35A is a relatively new fighter aircraft with fewer years in service, the expected mishap rate is not expected to be different than other fighter aircraft. The 127 WG would continue to use the same SUA that they currently use. The 127 WG has a robust BASH program, and BASH incidents could be expected to decline with the F-35A as described. The lifetime Class A mishap rate for the A-10 aircraft is 1.90 and the lifetime Class A mishap rate for the F-22 is 6.11, which is considerably higher than the A-10. Though the potential for an aircraft accident to occur in the residential area in the southern CZ is quite low, should it occur, it could be catastrophic to anyone residing in that area. Additionally, should an F-35A aircraft accident occur, the increased use of composite materials in this aircraft would increase the risk of exposure to respirable fiber products and toxic gases to individuals exposed. Should the 127 WG acquire the F-35A aircraft, potential mitigations to the risk of a Class A mishap in the CZ could include measures that could avoid or minimize the impacts, rectify any structural damage resulting from a mishap, or eliminate the risk entirely. Specific measures could include:
- Avoiding the impact by not basing the F-35A at Selfridge ANGB, though the risk for a Class A mishap from the legacy aircraft would remain.
- Impacts could continue to be minimized through the operational procedures currently implemented (departures/arrivals predominantly conducted to the north), or by shortening the runway on the south end.
- Impacts could be minimized over time through the USAF purchasing residential properties within the CZ as they become available for purchase. The USAF could also purchase the residences if the owners wished to sell due to the hazard.

Under the Proposed Action at Selfridge ANGB, impacts to safety would continue to be significant as a result of continued encroachment in the CZ.

MI3.5 LAND USE

MI3.5.1 Installation

The following section describes the affected environment and examines the extent to which the beddown of the F-35A at Selfridge ANGB would be consistent with state, regional, and local conservation and development plans and zoning regulations. In order to provide a comparable data set between proposed siting alternatives at the five locations considered for the Proposed Action, local land use categories were consolidated and/or renamed. Table MI3.5-1 provides a cross-reference between the Macomb County classifications and those used in this analysis.

Macomb County Land Use Classification	EIS Land Use Classification
Single Family Residential Low, Medium, Medium- High, High Density, Multiple Family Residential	Residential
Manufactured Housing	Manufactured Homes
Commercial, Office,	Commercial
Manufacturing	Manufacturing
Industrial	Industrial
Public	Public/Semi-Public
Specialty Planning Area	Planned/Current Mobile Home Park
Parks/Open Space	Parks/Open Space
Transportation/Communication/Utilities	Transportation/Communication/Utilities
Vacant	Vacant

 Table MI3.5-1.
 Land Use Categories

Legend: EIS = Environmental Impact Statement.

MI3.5.1.1 Affected Environment

The 127 WG of the MIANG is located at Selfridge ANGB in Harrison Township, Macomb County, Michigan, approximately 20 miles north of Detroit, Michigan on the shore of Lake St. Clair (see Figure MI1.0-1). Chesterfield Township is located on the northern boundary of the base. Selfridge ANGB occupies approximately 3,075 acres and is a Joint Military Community with more

than 40 tenants, including the Army, USAF, Marines, Navy, Coast Guard, U.S. Border Patrol, and the Department of Homeland Security. The 127 WG is the host unit at Selfridge ANGB.

Macomb County, Chesterfield, and Harrison Townships are all members of the Southeast Michigan Council of Governments (SEMCOG). SEMCOG is the principal regional planning agency serving the seven-county southeast Michigan region. Its main role is to foster inter-governmental cooperation and to coordinate planning activities that are regional in scope. SEMCOG's principal planning activities involve the following areas: transportation, community/economic development, water/air quality, solid waste disposal, sewage treatment, storm drainage, public safety, and land use. SEMCOG also maintains the region's most extensive database used for planning and economic development purposes. Several of SEMCOG's activities have some influence on both Chesterfield and Harrison Townships, either directly or indirectly (SEMCOG 2017).

Land use planning in the area surrounding Selfridge ANGB is accomplished by Macomb County, Chesterfield Township, and Harrison Township together. Rather than developing County-wide plans or growth policies, the Macomb County Planning Commission assists local units of governments, such as Harrison and Chesterfield Townships, in establishing their own land use goals and plans. This is accomplished by providing local planning commissions with a range of resources to help facilitate better planning. Among the many services provided by Macomb County are economic development assistance, coordination of the subdivision review process, aerial photography, and Geographic Information System (GIS) mapping resources. Harrison Township has also incorporated the Selfridge ANGB AICUZ study into its master plan and planning principles. The Harrison Township Master Plan identifies the CZs and APZs from the AICUZ as a planning influence and the township has attempted to coordinate land use with the AICUZ recommendations and the development community (Harrison Township 2010).

Selfridge ANGB is bounded by Harrison Township to the west, south, and southeast. Chesterfield Township is to the north and Lake St. Clair forms the eastern boundary. The land use directly south of Selfridge ANGB is primarily residential, with small sections of commercial, parks/open space, and public/semi-public. The eastern area that is not Lake St. Clair is a mix of commercial areas directly adjacent to the Selfridge ANGB boundary, and some waterfront residential land use slightly further east. The area to the west of Selfridge ANGB is a mix of various land uses, including manufacturing, commercial, public/semi-public, manufactured homes, parks/open space, and residential. Similar land uses occur to the north of Selfridge ANGB, with the addition of agricultural land use along the northern boundary, and pockets of vacant land use (Figure MI3.5-1).

United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



Land use activities most sensitive to noise typically include residential and commercial use, public services, and areas associated with cultural and recreational uses such as parks/open space. Noise measurements related to aircraft operations that define the area of noise impact are expressed in terms of DNL. DNL represents the average annual day noise exposure from aircraft operations during a 24-hour period over a year.

The DoD has established noise compatibility criteria for various land uses. According to these criteria, sound levels up to 65 dB DNL are compatible with land uses such as residences, transient lodging, and medical facilities. Currently, aircraft noise from Selfridge ANGB exposes approximately 21 acres of off-airport areas of commercial, manufacturing, and other to noise levels above 65 dB DNL to the north of the base. Section MI3.1, *Noise*, discusses existing noise levels on POIs such as schools and churches located within the 65 dB DNL off-airport noise contour areas. Figure MI3.5-1 shows existing noise contours and the land use in the vicinity of Selfridge ANGB.

MI3.5.1.2 Environmental Consequences

Proposed Action

All new construction would occur on previously disturbed land and would be totally within the boundary of Selfridge ANGB. There would be no change to the existing airfield-related Runway Protection Zones (RPZs) and CZs. Therefore, the focus of this analysis is on changes in off-base noise conditions.

The land use analysis compares the proposed noise contours to current noise contours, which show the existing noise environment. The comparison of the proposed contours to the current contours shows potential change in noise conditions and land use compatibility (Table MI3.5-2 and Figure MI3.5-2). The Proposed Action would result in an overall increase in the off-base area affected by noise levels between 65 and 80 dB DNL by approximately 1,073 acres. Approximately 475 acres of residential land use would be included in the 65-75 dB DNL noise contour rendering this acreage potentially incompatible for residential use (Table MI3.5-2). This would be considered a significant impact. However, incompatibility does not constitute a federal determination that any land use is acceptable or unacceptable under federal, state, or local law, nor are they used to determine if a structure is habitable or uninhabitable. No residential land use would be within areas affected by noise greater than 75 dB DNL.

Land Use Category	65-70 (C)	65-70 (P)	65-70 (AC)	70-75 (C)	70-75 (P)	70-75 (AC)	75-80 (C)	75-80 (P)	75-80 (AC)	80-85 (C)	80-85 (P)	80-85 (AC)	85+ (C)	85+ (P)	85+ (AC)	Totals (C)	Totals (P)	Totals (AC)
Residential	0	443	443	0	32	32	0	0	0	0	0	0	0	0	0	0	475	475
Commercial	8	82	73	0	88	88	0	1	1	0	0	0	0	0	0	8	171	163
Manufacturing	11	88	77	0	88	88	0	6	6	0	0	0	0	0	0	11	182	171
Vacant	0	45	45	0	0	0	0	0	0	0	0	0	0	0	0	0	45	45
Other*	2	205	203	0	15	15	0	0	0	0	0	0	0	0	0	2	220	218
Total	21	863	842	0	223	223	0	7	7	0	0	0	0	0	0	21	1,094	1,073

Table MI3.5-2. Off-Base Land Uses Affected by Noise Levels 65 dB DNL and Greater under Proposed Action

Note: Numbers may not add up due to rounding errors.

* = includes areas such as roads, water, etc.

Legend: (C) = Current; (P) = Proposed; (AC) = Acres Change; dB = decibel; DNL = Day-Night Average Sound Level.

United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020



No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing A-10 aircraft. Land use would be expected to remain as described under affected environment in Section MI3.5.1.1. Therefore, there would be no significant impacts to land use under the No Action Alternative.

MI3.5.2 Airspace

MI3.5.2.1 Affected Environment

The training airspace associated with the 127 WG includes the Pike East, Pike West, and Steelhead MOAs, and R-4201A, R-4201B, and R-4207. The Pike East MOA, which fully encompasses R-4207, lies almost entirely over Lake Huron and is bounded to the east by the U.S.-Canada border. The Steelhead MOA lies over portions of Lake Huron and the southeastern portion of Michigan. Land under Steelhead MOA lies within the counties of Huron, Tuscola, and Sanilac. Several small towns are under the airspace, and Albert Sleeper State Park is on the shore of Lake Huron directly under the middle of the MOA (Figure MI3.5-3). Huron National Forest lies under the southern portion of Pike West MOA, and Lake Huron lies under the northern portion. Land under the middle portion of Pike West MOA includes Hubbard Lake, various Michigan state parks, and the counties of Alcona, Alpena, Oscoda, Presque Isle, and portion of Montmorency County under the western boundary. This area is also dotted with small towns and coastal tourist spots along Lake Huron. Land under R-4201 is DoD-owned.



MI3.5.2.2 Environmental Consequences

Proposed Action

The Proposed Action would not generate changes to the status or use of underlying lands, nor would it affect existing plans or policies implemented for land management. Standard flight rules require all pilots to avoid direct overflight of populated areas by 1,000 feet and structures by 500 feet. Furthermore, the FAA and DoD have identified and published avoidance criteria for specific aviation-related or noise-sensitive areas. The beddown action would not require changes in SUA attributes, volume, or proximity; and it is expected that the type and number of ordnance employed at the range would remain the same or decrease. All F-35A flight activities would take place in existing airspace, so no airspace modifications would be required. The differences in utilization of the existing airspace include use of higher altitudes overall, combined use of existing airspace, and generally higher altitudes for supersonic flights that occur. Because the A-10s do not conduct supersonic flights, the F-35As would introduce supersonic operations by the 127 WG. Military aircraft conduct supersonic operations only in the airspace authorized for such use. The F-35A would be expected to fly more of the time at higher altitudes than the A-10s (see Table MI2.2-2), operating more than 90 percent of the time above 10,000 feet MSL. F-35A aircraft (as do existing military aircraft) would adhere to all established floors and ceilings of airspace units. All airspace associated with the 127 WG lies within the typical flight distance available during a standard daily training flight for the F-35A. Impacts to land use under the SUA would not be significant.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing A-10 aircraft. Land use would remain as described in the affected environment in Section MI3.5.2.1. Therefore, there would be no significant impacts to land use as a result of the No Action Alternative.

MI3.5.3 Summary of Impacts

Under the Proposed Action at Selfridge ANGB, there would be an increase of 1,073 acres off-base that would be contained within the 65 dB DNL and greater noise contour, including approximately 475 acres of residential land use would be included in the 65-75 dB DNL noise contour, rendering this acreage potentially incompatible for residential land use, which would be considered a significant impact. There would be no anticipated changes to the status or use of lands under the SUA as a result of the Proposed Action; therefore, impacts to land use under the SUA would not be significant.

MI3.6 SOCIOECONOMICS

MI3.6.1 Installation

MI3.6.1.1 Affected Environment

The 127 WG installation is located at Selfridge ANGB in Harrison Township in Macomb County, Michigan.

Population

Population information for the state of Michigan, Macomb County, and Harrison Township is presented in Table MI3.6-1. The population of Harrison Township increased by 126 people between 2000 and 2010 and then increased by an additional 303 between 2010 and 2016. This represents a 1.8 percent increase in the population since 2000. Macomb County showed a higher growth rate with a 9.1 percent increase. The state of Michigan decreased by 54,804 people between 2000 and 2010 and then increased by 25,906 people between 2010 and 2016. Overall, this was a decrease of 0.3 percent of the population between 2000 and 2016.

Area	2000	2010	2016	Percent Change 2000-2016	Percent Change 2010-2016
Michigan	9,938,444	9,883,640	9,909,600	-0.3%	0.3%
Macomb County	788,149	840,978	859,703	9.1%	2.2%
Harrison Township	24,461	24,587	24,890	1.8%	1.2%

Table MI3.6-1. Population, 2000, 2010, and 2016

Source: U.S. Census Bureau 2000, 2010, and 2016a.

Employment and Income

Table MI3.6-2 provides employment and income data for the state of Michigan, Macomb County, and Harrison Township. Median household income and per capita income in Harrison Township in 2016 were higher than in Macomb County and the state of Michigan overall. The unemployment rate as of early 2018 at the state and county level were both low and Macomb County's rate of 4.4 percent was lower than the rate for the state as a whole which was 5.2 percent.

 Table MI3.6-2.
 Employment and Income Statistics

Area	Median Household Income (2016)	Per Capita Income (2016)	Labor Force (2016)	Employed (2018)	Unemployed (2018)	Unemployment Rate (2018)
Michigan	\$50,803	\$27,549	4,888,665	4,634,420	254,245	5.2%
Macomb County	\$55,951	\$28,588	437,393	418,025	19,368	4.4%
Harrison Township	\$57,673	\$33,536	N/A	N/A	N/A	N/A

Note: Employment data for Harrison Township is not available from the Bureau of Labor Statistics.

Legend: N/A = Not Applicable.

Source: U.S. Census Bureau 2016b; Bureau of Labor Statistics 2018a, 2018b.

Housing

As shown in Table MI3.6-3, in 2016 there were an estimated 1,113 vacant housing units in Harrison Township and an estimated 22,265 vacant housing units in Macomb County. The overall vacancy rate for housing was 9.1 percent in Harrison Township and 6.2 percent in Macomb County. Both rates were lower than the vacancy rate for Michigan, which was 15.1 percent.

Area	Housing Units	Vacant Housing Units	Housing Vacancy Rate
Michigan	4,544,920	684,526	15.1%
Macomb County	361,158	22,265	6.2%
Harrison Township	12,203	1,113	9.1%
	016		

 Table MI3.6-3.
 Housing Characteristics, 2016

Source: U.S. Census Bureau 2016c.

MI3.6.1.2 Environmental Consequences

Proposed Action

Preliminary estimates of the construction required under this alternative place the cost of construction between \$90 and \$120 million. Additionally, there would be an anticipated increase in the number of operational personnel. As such, both construction and operational activities would impact socioeconomic conditions.

Population and Housing

Based on estimated construction spending and data from the 2012 Survey of Business Owners, which indicate an average of one construction worker for every \$285,520 in construction sales, construction for the Proposed Action would require a total of between 315 and 420 construction workers over the 2020 to 2023 period (U.S. Census Bureau 2012). No permanent population increase would be anticipated as the construction would not be permanent, and the local construction workforce and journeymen could meet the labor demand.

During operations, an Active Duty Associate Unit of up to 50 personnel would be installed at Selfridge ANGB. In addition, up to 35 new personnel would be added to provide security and contract oversight for FMS and the ALIS. Overall, up to 85 additional personnel would be required. While it is likely that many of the additional personnel would already reside in the area, some population increase may occur. Under a maximum impact scenario, if all of the 85 additional personnel relocated from outside the area and brought dependents, assuming an average household size of 2.6, the total population increase would be up to 221 people, which would be an increase of 0.9 percent of the population of Harrison Township and less than 0.1 percent of the population of Macomb County. Assuming the 85 additional personnel (and their dependents) required one housing unit each, 85 additional housing units would be demanded, which could easily be absorbed

by the areas vacant units, requiring 7.6 percent of the vacant housing units in Harrison Township, and just 0.4 percent of the housing in Macomb County.

For both construction and operations, impacts related to population and housing would be negligible.

Employment and Income

Construction activities associated with the Proposed Action are estimated to sustain between 315 and 420 construction jobs. Based on 2017 construction industry salaries for Macomb County (Bureau of Labor Statistics 2018a), those jobs would generate a total of between \$20.7 and \$27.8 million in income over the 2020 to 2023 period.

An additional 85 permanent personnel would be added for the operational phase of the Proposed Action. Based on 2017 transportation industry salaries (Bureau of Labor Statistics 2018a), those jobs would generate approximately \$4.25 million in income per year, for the life of the project.

The increases in employment and income would be beneficial but negligible.

Property Values and Property Taxes

Property values are a function of many different variables, including noise levels. The issue of the negative effect of airport noise on property values has been widely researched. A more full discussion of the impacts of noise levels on property values and resultant real estate taxes is contained in Appendix B, Noise Modeling, Methodology, and Effects. The property value to noise effects relationship is presented in the form of the Noise Depreciation Index (NDI), which reflects the estimated percent loss of property value per dB DNL (see Section 3.2.2). A review of several relevant studies (see Appendix B) concludes that noise may affect property values and related taxes in a NDI range of 0.2 to 2.0 percent per dB of noise increase, which correlates to an average loss of 0.5 percent of the property value per dB. The value of the property is determined based on many individual variables which, when taken together, form the total price and requires detailed information on local housing markets and actual sales prices. Furthermore, price property value studies model relationships between city level income and population data, and the overall willingness to pay for noise abatement, which enables an estimate of noise impacts in locations where detailed housing data is not available. The cost of noise mitigation is less of a factor in regions that experience extreme temperatures. Many structural elements designed to improve energy conservation also improve the acoustic performance of homes. The way properties are used in hot or cold environs (such as not opening windows for ventilation) can add as much as 15 dB of noise mitigation. The anticipation of noise level increase may also influence property values before the noise increases actually occur.

The range of impacts provided in Appendix B of 0.2 to 2.0 percent per dB serve as a rough estimate of potential impacts. These impacts will vary from location to location depending on the many other factors that influence property value including local market conditions. If an area does in fact suffer from lower property values associated with increased noise levels, this will result in lower property taxes collected. Over time, lower sales prices in these areas will result in lower appraised values.

Table MI3.6-4 shows estimates of total property values and taxes in the census block groups within the 65 dB DNL contour line. Conservative estimates are shown giving a range of potential property value loss due to increased noise levels and the resulting range of potential property tax losses. These estimates assume that houses in the block groups within the 65 dB DNL contour line are exposed to 10 dB DNL increase in noise. As shown in Table MI3.1-9, POIs surrounding Selfridge ANGB would experience marginal noise increases ranging from 5 to 14 dB DNL.

Area*	Housing Units	Estimated Total Value**	Potential Property Value Loss with an average of 10 dB DNL of Noise Increase Low (0.2%)	Potential Property Value Loss with an average of 10 dB DNL of Noise Increase High (2.0%)	Potential Annual Property Tax Loss (1.74% Property Tax Rate) Low	Potential Annual Property Tax Loss (1.74% Property Tax Rate) High	
Census Tract 2211							
Block Group 1	873	\$140,441,901	\$2,808,838	\$28,088,380	\$48,874	\$488,738	
Block Group 3	1,314	\$205,903,800	\$4,118,076	\$41,180,760	\$71,655	\$716,545	
Census Tract 2471	Census Tract 2471						
Block Group 1	460	\$6,345,444	\$126,909	\$1,269,089	\$2,208	\$22,082	
Census Tract 2472	Census Tract 2472						
Block Group 2	1,169	\$224,214,200	\$4,484,284	\$44,842,840	\$78,027	\$780,265	
Block Group 3	584	\$101,324,000	\$2,026,480	\$20,264,800	\$35,261	\$352,608	
Block Group 4	693	\$106,004,910	\$2,120,098	\$21,200,982	\$36,890	\$368,897	
Census Tract 2682							
Block Group 1	720	\$148,896,000	\$2,977,920	\$29,779,200	\$51,816	\$518,158	
Block Group 2	402	\$73,123,800	\$1,462,476	\$14,624,760	\$25,447	\$254,471	
Block Group 3	453	\$106,590,900	\$2,131,818	\$21,318,180	\$37,094	\$370,936	
Census Tract 9821							
Block Group 1	58	\$8,508,600	\$170,172	\$1,701,720	\$2,961	\$29,610	
Macomb County Total	362,764	\$59,263,070,808	\$22,256,899	\$222,568,991	\$387,270	\$3,872,700	

Table MI3.6-4. Property Values and Property Tax Loss, 2017

Note: *See Figure MI3.7-2 for block group locations.

**Total value of housing units was estimated using Census data for aggregate housing value and median house value from the American Community Survey.

Source: U.S. Census Bureau 2017, Tax-rates.org 2019.

Overall, the potential lost property value would represent between 0.04 and 0.38 percent of the tax base of Macomb County.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing A-10 aircraft. Socioeconomics would be expected to remain as described under affected environment in Section MI3.6.1.1. Therefore, there would be no significant impacts to socioeconomics under the No Action Alternative.

MI3.6.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for socioeconomics was considered to consist only of the installations themselves. The socioeconomic aspect of potential impacts to lands underlying SUA was not evaluated because no construction or other ground disturbance would occur to generate economic activity.

MI3.6.3 Summary of Impacts

Under the Proposed Action at Selfridge ANGB, the population of Macomb County could increase by less than 0.1 percent from the additional personnel associated with the day-to-day operations at the installation. There would be slight permanent increases in employment (up to an estimated 85 jobs) and income (approximately \$4.25 million per year). There is sufficient housing in the County for the slight increase in permanent personnel at the base. While property values are a function of many local variables, studies have shown that noise increases have the potential to impact property values near airports from a low of approximately 0.2 percent to a high of approximately 2.0 percent. Noise increases, as the sole variable, have the potential to negatively impact individual homeowners' property values near Selfridge ANGB from between a 0.2 to a 2.0 percent decrease, while other variables could drive a different result overall. Any potential parallel decline in property tax revenues would result in a minor impact. Impacts to socioeconomics associated with the F-35A beddown at Selfridge ANGB would not be significant overall.

MI3.7 Environmental Justice and the Protection of Children

MI3.7.1 Installation

MI3.7.1.1 Affected Environment

Minority and Low-Income Populations

Figure MI3.7-1 highlights the Census block groups in Macomb County that are considered environmental justice low-income or minority areas. Out of a total of 627 Census blocks in Macomb County, 47 are classified as having minority populations, 137 are classified as having low-income populations, and 30 of those are classified as both minority and low-income (U.S. Census Bureau 2016d, 2016e).

Protection of Children

Harrison Township has an estimated 4,654 children under the age of 18, which is approximately 18.7 percent of the population (U.S. Census Bureau 2016a). This rate is lower than the rate for both Macomb County (21.9 percent) and the state of Michigan (22.5 percent), which have 188,610 and 2,227,763 children under the age of 18, respectively. According to the National Center for Education Statistics (2016), there are a total of 230 schools in Macomb County with a total of 127,810 students.

Elderly Populations

An estimated 4,290 people in Harrison Township, or 17.2 percent of the population, are 65 years of age or older and considered elderly (U.S. Census Bureau 2017). In Macomb County, 15.9 percent of the population is elderly (137,311 people) and in the state of Michigan it is also 15.9 percent (1,575,233 people).



MI3.7.1.2 Environmental Consequences

Proposed Action

Minority and Low-Income Populations

The primary concern under this Proposed Action for impacts on minority and low-income populations is the potential for increased noise exposure. Figure MI3.7-2 shows the Census block groups around Selfridge ANGB that would be exposed to noise levels of 65 dB DNL or higher under the affected environment or that would be exposed to noise levels of 65 dB DNL or higher under the Proposed Action. Table MI3.7-1 lists the 10 Census block groups that would be exposed to noise levels between 65 and 75 dB DNL under the affected environment or the Proposed Action and indicates which block groups would be newly exposed under the Proposed Action. None of the block groups are considered low-income or minority areas. While the change in the noise environment associated with the Proposed Action would be considered significant in the area surrounding the airfield, the impacts would not disproportionately impact low-income or minority populations. Therefore, there would be no significant impacts to low-income populations or minorities.

Protection of Children

As discussed in Section MI3.1, under the Proposed Action, five schools (Tots Center, Dean Naldrett, Green Elementary, Frederick Pankow, and South River) would experience two interfering events per hour for the windows open condition. Only South River would experience two interfering events per hour in the windows closed condition. The time above 50 dB would increase between 1 and 3 minutes, up to a maximum of 9 minutes at Green Elementary, due to the Proposed Action. The causation of speech interference may hinder the ability of students (including low-income and minority students) to learn, which could constitute an adverse impact to children, to include low-income and minority children, although no schools or childcare centers would experience noise levels of 65 dB DNL or higher.



United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020

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Area	Minority Population	Poverty Rate	Population Under the Age of 18	Elderly Population (Aged 65 years or older)	Newly Exposed to Proposed Contours
Michigan	24.3%	16.3%	22.5%	15.9%	N/A
Macomb County	19.1%	12.0%	21.9%	15.9%	N/A
Harrison Charter Township	14.7%	9.9%	18.7%	17.2%	N/A
Census Block Groups					
Census Tract 2211					
Block Group 1	4.8%	5.4%	27.5%	4.2%	Yes
Block Group 3	7.5%	6.0%	24.5%	7.8%	Yes
Census Tract 2471					
Block Group 1	19.7%	50.0%	28.0%	15.7%	No
Census Tract 2472					
Block Group 2	20.8%	7.0%	26.0%	5.9%	Yes
Block Group 3	4.5%	0.0%	12.0%	21.6%	No
Block Group 4	1.7%	8.9%	8.9%	17.5%	Yes
Census Tract 2682					
Block Group 1	6.2%	8.1%	23.0%	13.1%	No
Block Group 2	6.7%	12.5%	23.2%	10.9%	Yes
Block Group 3	0.8%	8.8%	12.9%	17.0%	Yes
Census Tract 9821					
Block Group 1	0.0%	0.0%	0.0%	0.0%	No

Table MI3.7-1. Census Block Groups Exposed to Noise Levels between 65 dB and 75 DNL
Under Current and Proposed Action Conditions

Note: *See Figure MI3.7-2 for block group locations.

Source: U.S. Census Bureau 2016a, 2016b, 2017.

Table MI3.7-1 shows the percent of the populations of the block groups that are under 18. Six block groups that would be exposed to noise levels between 65 and 75 dB DNL under the Proposed Action have populations with a higher proportion of children than Macomb County whose population is 21.9 percent children. Census tract 2471, block group 1 is composed of 28.0 percent children. As previously mentioned, this block group would be exposed to noise levels between 65 and 75 dB DNL in a very small unpopulated portion of the block group. Census tract 2682, block groups 1 and 2 are 23.0 percent and 23.2 percent children, respectively, and Census tract 2211, block groups 1 and 3 are 27.5 percent and 24.5 percent children, respectively. These block groups are located directly to the north of Selfridge ANGB. Census tract 2472, block group 2 is 26.0 percent children and is located south of Selfridge ANGB.

In Figure MI3.7-2, schools and childcare centers are shown with green and purple dots, respectively. None of the schools or childcare centers in the area would be exposed to noise levels of 65 dB DNL or greater under the Proposed Action. There are six impacted block groups that have higher proportions of children than the surrounding area and there are four impacted block groups that have lower proportions of children than the surrounding area. Therefore, children would be significantly disproportionately impacted by the Proposed Action; however, the USAF does not anticipate it would be necessary to close any schools as a result of a basing decision. Interference with classroom speech is discussed in detail in Chapter 4, Section MI3.1.1.2. It is

important to note also that most permanent structures, including school buildings, can be effectively insulated from any distracting, exterior noise. Such mitigation is available from the FAA's noise mitigation programs and other sources. Further information on impacts associated with noise can be found in Section MI3.1.

Elderly Populations

Older adults have been identified as sensitive receptors to potential adverse impacts due to physiological and behavioral changes that come with age (Air Force Civil Engineer Center [AFCEC] 2014). Table MI3.7-1 shows the percent of the populations of the block groups that are elderly. Three of the ten block groups that would be exposed to noise levels of 65 dB DNL or higher have a higher percentage of elderly people than Macomb County as a whole.

A review of nursing homes and assisted care facilities found that there would be no such facilities within the 65 dB DNL contour (Homeland Infrastructure Foundation-Level Data 2019). Because most of the impacted block groups do not contain a higher proportion of elderly residents than the surrounding region and there are no nursing homes or assisted living facilities for the elderly in the impacted areas, impacts to the elderly would not be disproportionate and would be minor.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing A-10 aircraft. Environmental justice and the protection of children would be expected to remain as described under affected environment in Section MI3.7.1.1. Therefore, there would be no significant disproportionate impacts to low-income populations, minorities, or children under the No Action Alternative.

MI3.7.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for environmental justice was considered to consist only of the installations themselves. Environmental justice and potential effects to children in communities under the SUA were not evaluated because the only anticipated impacts would be due to aircraft noise, but any changes in noise levels in these areas are anticipated to be minor and would not impact human populations.

MI3.7.3 Summary of Impacts

While noise levels would rise relative to the affected environment for some residents of lowincome and minority areas, there would be no associated health or environmental risk in these areas and there would be no significant disproportionate impacts to low-income or minority populations. Some schools would be affected by increased noise levels, with associated adverse impacts of interrupted speech and hindrance of learning and several block groups that would be exposed to noise levels of between 65 and 75 dB DNL have greater proportions of children than the surrounding areas. This would lead to significant disproportionate impacts to children. Impacts to the elderly would not be disproportionate and would be minor.

MI3.8 INFRASTRUCTURE

MI3.8.1 Installation

MI3.8.1.1 Affected Environment

Potable Water

Potable water for Selfridge ANGB is provided by the City of Mount Clemens, which is supplied primarily from Lake St. Clair, which is transported to the City treatment plant. In calendar year (CY) 2017, approximately 3,311,425 gallons of potable water were supplied to the 127 WG (127 WG 2017b).

Wastewater

The 127 WG generates wastewater from sanitary, stormwater, and industrial processes, including oil/water separator (OWS) discharge, wash rack discharge, floor wash-down, latrines, sinks, and showers. The 127 WG has an industrial sanitary discharge permit with the Great Lakes Water Authority and has limited pretreatment for OWSs. Wastewater generated within Selfridge ANGB is conveyed into the municipal sewage system to Harrison Township Wastewater Treatment Plant. Remote portions of the installation still have septic systems that use sanitary leach fields and/or septic holding tanks. Wastewater is then pumped to the Detroit Municipal Wastewater Treatment Plant, which has the capacity to treat approximately 930,000,000 gallons of wastewater daily (Detroit Water and Sewerage Department 2015).

Stormwater

A high percentage of the active administrative and industrial areas of the installation are paved or roofed, resulting in high runoff rates during precipitation events. As described in the Selfridge ANGB SWPPP (127 WG 2015a), Selfridge ANGB has a stormwater drainage conveyance system

typified by over land flow to catch basins, storm sewers, and pump/lift stations that discharge to Lake St. Clair and Clinton River or other municipal separate storm sewer systems (see Section MI3.10, *Water Resources*). The stormwater drainage system has been designed to safely collect and transport surface water runoff from storm events to prevent flooding within the installation and is a separate system from the wastewater (sewage) system.

Electrical and Natural Gas Systems

Electricity is supplied to the 127 WG by DTE Energy. Natural gas is supplied by a State of Michigan Cooperative program. Electricity consumption for CY 2017 for the 127 WG was approximately 24,792,011 kilowatt-hours. Natural gas consumption for CY 2017 at the 127 WG installation was approximately 114,145 hundred cubic feet (127 WG 2017b).

Solid Waste Management

Municipal solid waste at Selfridge ANGB is managed in accordance with the Selfridge ANGB Integrated Solid Waste Management Plan (Selfridge ANGB 2013) and guidelines specified in AFI 32-7042, *Waste Management* (2017). In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for recycling, diversion, handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and pollution prevention.

The 127 WG generates solid waste in the form of office trash, nonhazardous industrial wastes, normal municipal waste, and construction debris. These nonhazardous solid wastes are collected in dumpsters located throughout Selfridge ANGB and transported by contractor to the Arbor Hills Expanded Sanitary Landfill in Northville, Michigan; Riverview Land Preserve in Riverview, Michigan; or Detroit Renewable Power in Detroit, Michigan (Waste-to-Energy Facility).

Transportation

Regional access to Selfridge ANGB is provided by Interstate 94 which runs north and south from Port Huron to Detroit. The primary entrance to Selfridge ANGB is located on the north side and is accessed from M-59 (also known as Hall Road) and Rosso Highway at Jefferson Avenue. A second gate is located on the south side of the base with access off North River Road. A third gate, which is normally closed due to non-compliance with AT/FP requirements, is located on the west side and is located at the end of Henry B. Joy Boulevard. Vehicle circulation on the installation is accomplished primarily by three major roads on the east side of the base (Jefferson Avenue, George Avenue, and Wilber Wright Boulevard).

MI3.8.1.2 Environmental Consequences

Proposed Action

Potable Water

Water consumption would be expected to increase slightly under the Proposed Action as a result of the small increase in personnel; however, an increase of up to approximately 85 personnel on the installation would not be expected to impact regional water supply. Additionally, the demand for water (e.g., if used to control dust) could also increase during demolition and construction phases. However, this increase would be temporary and intermittent and would not be expected to impact regional water supply.

Wastewater

Wastewater generation would be expected to increase slightly as a result of the increase of up to approximately 85 personnel on the installation. However, there have been no deficiencies identified with the existing system, and it is expected that the existing sanitary sewer system is generally adequate to serve the facilities proposed under this alternative.

Stormwater

Under the Proposed Action, there would be up to 104,000 SF (2.4 acres) of new construction footprint, including up to 59,400 SF (1.4 acre) of new impervious surface as a result of proposed construction. In accordance with the EISA Section 438, any temporary increase in surface water runoff as a result of the proposed construction would be attenuated through the use of temporary and/or permanent drainage management features. The proposed construction activities could temporarily impact the quality of stormwater runoff (see Section MI3.10, *Water Resources*). However, implementation of appropriate standard construction practices (as described previously), preventative maintenance, and periodic inspections and sampling to detect risk to stormwater, especially during active construction activity would minimize these potential impacts. Therefore, impacts to the existing stormwater drainage system would be minimal.

Electrical and Natural Gas Systems

Demand for electricity and natural gas would be expected to increase slightly as a result of the increase in personnel, and the building space and facilities to be constructed would require additional electricity. However, any new facilities and additions associated with the Proposed Action would be implemented with more energy-efficient design standards and utility systems than are currently in place. In addition, construction projects would incorporate Leadership in Energy and Environmental Design and sustainable development concepts to achieve optimum

resource efficiency, sustainability, and energy conservation. Therefore, average energy consumption would be expected to remain consistent or decrease compared to energy consumption associated with existing facilities.

Construction activity associated with the Proposed Action could result in some temporary interruption of utility services during construction. These impacts would be temporary, occurring briefly during active construction periods. In addition, the demand for energy (primarily electricity) could increase slightly during demolition and construction phases. The energy supply at the installation and in the region is adequate and would not be affected by this temporary increase in demand.

Solid Waste Management

The building space and facilities to be constructed would generate construction and demolition debris requiring landfill disposal. Proposed increases in personnel and equipment use would also contribute to an increase in solid waste generation. However, impacts to local landfills would not be expected to exceed the permitted throughput or contribute substantially to the remaining capacity.

Off-installation contractors completing construction and demolition projects at the 127 WG installation would be responsible for disposing of waste generated from these activities. Contractors would be required to comply with federal, state, and local regulations for the collection and disposal of municipal solid waste from the installation. Much of this material can be recycled or reused, or otherwise diverted from landfills. All non-recyclable construction and demolition waste would be collected in a dumpster until removal. Construction and demolition waste contaminated with hazardous waste, ACM, LBP, or other undesirable components would be managed in accordance with AFI 32-7042, *Waste Management* (2017).

Transportation

Construction equipment would be driven to proposed construction areas and would be kept on-site for the duration of the respective activity. Construction workers would drive daily in their personal vehicles to and from the construction site. In general, construction traffic would result in increases in the use of on-installation roadways during construction activities; however, increases would be temporary and intermittent, occurring only during active construction periods.

The number of authorized personnel on the installation would increase by up to approximately 85 under the Proposed Action (see Section MI2.1.4). The increase in personnel would create a potential 85 additional one-way vehicle trips to and from the installation during morning and evening peak periods for these additional personnel. Assuming that each person makes two, one-way trips per day, the implementation of the Proposed Action would add an additional 170 trips

onto the existing roadway network after the construction phase is complete. However, regional roads used to access the base, as well as those located on the base, have sufficient capacity to manage this increase in traffic without substantial impacts to circulation. Therefore, impacts to transportation infrastructure would not be significant under the Proposed Action.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing A-10 aircraft. Infrastructure would be expected to remain as described under affected environment in Section MI3.8.1.1. Therefore, there would be no significant impacts to infrastructure under the No Action Alternative.

MI3.8.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for infrastructure was considered to consist only of the installations themselves. The ROI for infrastructure does not include land beneath the SUA because no ground disturbance, construction, or changes in infrastructure would occur.

MI3.8.3 Summary of Impacts

Under the Proposed Action there would be no substantial changes expected to potable water, wastewater systems, stormwater management, energy supply systems, solid waste management, or transportation routes. Impacts to infrastructure at Selfridge ANGB as a result of the proposed F-35A beddown would not be significant.

MI3.9 EARTH RESOURCES

MI3.9.1 Installation

MI3.9.1.1 Affected Environment

Geology

Selfridge ANGB is located in the southeast corner of Michigan on the edge of the Michigan Basin. The basin consists of sedimentary rocks ranging from older Cambrian rocks, located around the edges, to younger Jurassic rocks in the middle. Beneath the Cambrian rocks are igneous, metamorphic, and sedimentary rocks of the Precambrian Age (MIANG 1997). The unconsolidated overburden beneath the base consists of glacial lacustrine sediments, made up clays and silts

deposited during the Wisconsin Glaciation period (Selfridge ANGB 2018). Beneath the unconsolidated overburden is the Late Devonian Antrim Shale, which consists of dark gray to black and brown, hard, thin-bedded, brittle carbonaceous shale ranging in thickness from 120 to 600 feet. The middle to late Devonian Traverse Group underlies the Antrim Shale and is divided into three units: the Traverse Formation, the Traverse Limestone, and the Bell Shale. The entire Traverse Group ranges in thickness from 100 to 800 feet (MIANG 1997).

Topography

Selfridge ANGB is located in Macomb County on the northwestern shore of Lake St. Clair, and is within the Central Lowland Physiographic Province of the Interior Plains, on glacial lake bed deposits of ancestral Lake St. Clair (MIANG 1997). The topography of the base is relatively flat with surface elevations ranging from 575 to 585 feet MSL. Topography on the base is dictated by natural features influenced by glacial lacustrine, fluvial processes, and man-made surfaces. The natural topography has been largely modified by excavation and fill operations during the construction of buildings, runways, taxiways, roads, and landfills and from reclaiming low-lying areas surrounding the lake (ANG 2006).

Soils

The majority of soil on the 127 WG installation has been disturbed by grading, cutting, and filling. The naturally occurring soils on the base are mostly comprised of the Toledo-Pauling association with soils of the Lanawee-Corunna-Lamson association on the southern portion of the base. The Toledo-Pauling association consists predominantly of clay with silty clay loam and the Lenawee-Corunna-Lamson association consists of moderately coarse to medium soils (ANG 2006). The Natural Resources Conservation Service (NRCS) Soil Survey for Macomb County, Michigan identifies 20 separate soil types on the base. Descriptions of the 20 soil types in order of the highest to lowest percentage on the base are as follows (U.S. Department of Agriculture 2017):

- Udorthents and Udipsamments, nearly level to hilly, loamy till, 0-30 percent slope;
- Lamson fine sandy loam, stratified coarse-loamy glaciofluvial deposits, 0-2 percent slope;
- Paulding clay, clayey glaciolacustrine deposits, 0-1 percent slope;
- Toledo silty clay loam, clayey glaciolacustrine deposits, 0-2 percent slope;
- Lenawee-Selfridge complex, clayey glaciolacustrine deposits, 0-3 percent slope;
- Toledo clay, clayey glaciolacustrine deposits, 0-2 percent slope;
- Mino fine sandy loam, stratified coarse-loamy glaciofluvial deposits, 0-4 percent slope;
- Lenawee silty clay loam, clayey glaciolacustrine deposits, 0-1 percent slope;
- Fulton loam, clayey glaciolacustrine deposits, 0-2 percent slope;
- Sanitary land fill;

- Brevort-Selfridge complex, sandy glaciofluvial deposits over loamy till, 0-2 percent slope;
- Willette muck, organic material over clayey till, 0-2 percent slope;
- Pipestone sand, sandy glaciolacustrine deposits, 0-3 percent slope;
- Ceresco fine sandy loam, coarse-loamy alluvium, 0-2 percent slope;
- Granby loamy fine sand, sandy glaciofluvial deposits, 0-2 percent slope;
- Selfridge loamy sand, sandy and loamy glaciolacustrine deposits over loamy till, 0-3 percent slope;
- Pipestone sand, loamy substratum, sandy glaciofluvial deposits over loamy till, 0-6 percent slope;
- Cohoctah fine sandy loam, coarse-loamy alluvium, 0-1 percent slope;
- Oakville fine sand, eolian deposits and/or glaciolacustrine deposits, 0-6 percent slope; and
- Sloan loam, stratified fine-loamy alluvium, 0-2 percent slope (U.S. Department of Agriculture 2017).

MI3.9.1.2 Environmental Consequences

Proposed Action

Under this alternative, new construction would consist of 14 separate projects resulting in up to 104,000 SF (2.4 acres) of new construction footprint, including up to 59,400 SF (1.4 acre) of new impervious surface. The total construction footprint analyzed represents the largest possible footprint of each of the options (Table MI2.1-2). These proposed construction projects would meet all criteria specified in ANG Handbook 32-1084, *Facility Space Standards*.

Geology and Topography

Proposed construction under this alternative would occur within the footprint of the developed ANGB and surrounding lands would not be impacted by any construction-related clearing and grading. As such, impacts to geology and topography would be negligible under the Proposed Action at the 127 WG."

<u>Soils</u>

Proposed construction under this alternative would occur on three soil types, including Lamson fine sandy loam (0-2 percent slope), Paulding clay (0-1 percent slope), and Udorthents and Udipsamments loamy till (0-30 percent slope). The majority of the proposed construction is on the Lamson fine sandy loam. The Lamson fine sandy loam and Paulding clay are rated by the NRCS Web Soil Survey as very limited for roads and small commercial building development due to ponding, shallow depth to the saturated zone, and high shrink-swell potential. The Udorthents and Udipsamments loamy till is also rated as very limited due to the slope. The 127 WG would

incorporate appropriate engineering practices necessary in order to construct on these types of soils. In addition, under the Farmland Protection Policy Act, the Lamson fine sandy loam and Paulding clay are designated as prime farmland if drained. However, the proposed construction is for national defense purposes and the surrounding land is already in urban development. Pursuant to the Farmland Protection Policy Act, the USAF determined that the land is not subject to the Farmland Protection Policy Act; therefore, the Farmland Protection Policy Act does not apply to this alternative.

To minimize potential impacts to soil associated with erosion, runoff, and sedimentation during construction activity, standard construction practices as described in the MIANG 127 WG SWPPP (127 WG 2015a) would be implemented during and following the construction period. Such practices could include the use of well-maintained silt fences or straw wattles, minimizing surficial areas disturbed, stabilization of cut/fill slopes, minimization of earth-moving activities during wet weather, and covering of soil stockpiles, as appropriate. A site-specific and detailed SWPPP that coordinates the timing of soil disturbing activities with the installation of soil erosion and runoff controls is an effective way of controlling erosion while soil is exposed and subject to construction activity. A NOI would be filed with the State of Michigan to obtain coverage under the General Permit for Stormwater Runoff from construction activities prior to implementation of individual projects. Construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation. Implementation of these measures, as necessary and appropriate, would ensure that impacts to earth resources under the Proposed Action would not be significant.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the 127 WG would continue to conduct their current mission using existing A-10 aircraft. Earth resources would be expected to remain as described under affected environment in Section MI3.9.1.1. Therefore, there would be no significant impacts to earth resources under the No Action Alternative.

MI3.9.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for earth resources was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance would occur.

MI3.9.3 Summary of Impacts

Under the Proposed Action at Selfridge ANGB, proposed construction would result in up to 104,000 SF (2.4 acres) of new construction footprint, including up to 59,400 SF (1.4 acre) of new impervious surface. Site-specific SWPPPs would be prepared for each construction project to ensure that runoff would be contained on-site. There are no special status soils associated with any of the proposed construction projects. Impacts to earth resources as a result of the proposed beddown of the F-35A at Selfridge ANGB would not be significant.

MI3.10 WATER RESOURCES

MI3.10.1 Installation

MI3.10.1.1 Affected Environment

Surface Water

The 127 WG installation at Selfridge ANGB is built upon filled wetlands and characterized by flat topography, poorly drained soils, and poor surface drainage. The most notable surface water features in the vicinity of Selfridge ANGB are Lake St. Clair to the east and the Clinton River to the south. The original elevation of the area occupied by the Selfridge ANGB was below the elevation of Lake St. Clair and the Clinton River. Shoring and filling have raised the elevation throughout most of the installation, with the exception of undeveloped areas adjacent to the Clinton River. In the areas adjacent to the river, seasonal high water table levels during periods of high rainfall range between below-surface levels to approximately 2 feet above surface level (Selfridge ANGB 2010). This condition results in intermittent standing water in some low-lying areas. In all other areas of the base, the water table remains below the surface year round as a result of continuous pumping (Selfridge ANGB 2010). Figure MI3.10-1 shows the wetlands and waters within and in the vicinity of Selfridge ANGB.

Due to the terrain characteristics of the installation at Selfridge ANGB, natural runoff flows toward Lake St. Clair and the Clinton River (Figure MI3.10-1). A series of catch basins, stormwater sewers, and pump/lift stations have also been installed to remove stormwater runoff, channeling stormwater to collection points throughout the installation. All runoff from the northern and eastern portions of the base is channeled into Lake St. Clair through three stormwater pump/lift stations. The rest of the base is drained to the south into the Clinton River by two stormwater pump/lift stations (Selfridge ANGB 2010).



United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement Final – February 2020

The state of Michigan, through the EGLE, Surface Water Division, issued a new individual stormwater permit for industrial discharges at Selfridge ANGB in July of 2011 (revised 2015; 127 WG 2015a). A SWPPP has been prepared to comply with the USEPA NPDES program. Associated with the permitting is the need to characterize the storm drainage areas, monitor the stormwater quality and implement BMPs to improve stormwater quality. The SWPPP also complies with AFI 32-7041, *Water Quality Compliance*.

Groundwater

Groundwater beneath the 127 WG at Selfridge ANGB generally occurs within 15 feet below ground surface within clayey and silty unconsolidated sediments of glacial and lacustrine origin. Yields from these layers are sufficient for domestic water sources; however, the irregular distribution of these sources makes them unreliable as a groundwater resource. Additionally, some wells in the area have produced mineralized water containing elevated levels of chloride, magnesium, sodium, and potassium but still meet safe drinking water standards (Selfridge ANGB 2010).

Groundwater also occurs in underlying Antrim Shale and the Traverse Group bedrock formations; however, yields are less than 10 gallons per minute and withdrawn water is highly mineralized (Selfridge ANGB 2010). The 127 WG at Selfridge ANGB has institutional controls that prohibit the installation of drinking water wells and crock wells on the base. The control was put in place to obtain closure for various cleanup sites under the restorations program (Selfridge ANGB 2010).

Floodplains

Fluctuation of water levels and periodic flooding along the shoreline of Lake St. Clair are a concern at Selfridge ANGB. Flooding impacts the mission through costly delays, cleanup, and repairs (Selfridge ANGB 2010).

Per the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Macomb County, Michigan, Panels 351H, 352H, 353H, 354H, and 356H (Map Numbers 26099C0351H, 26099C0352H, 26099C0353H, 26099C0354H, and 26099C0356H, Effective December 4, 2012), much of the eastern section of Selfridge ANGB, including the 127 WG installation is located within an area subject to inundation by 1-percent-annual-chance of flooding (i.e., 100-year floodplain designated as Zone AE) (FEMA 2012). The extent of the 100-year floodplain on the installation is shown in Figure MI3.10-1.

Wetlands

Wetland surveys were conducted in 2011 to determine the extent of wetlands on Selfridge ANGB. During this survey, 28 jurisdictional wetlands (total of 387 acres) were delineated (see

Figure MI3.10-1). Jurisdictional determination was received for these wetlands from the U.S. Army Corps of Engineers (USACE) in November of 2013 (USACE 2013) and final wetland boundaries were determined and confirmed by the EGLE in 2014 (EGLE 2014). Wetlands identified were classified as palustrine forested, emergent, scrub-shrub, and open water habitats. Emergent wetland consisted of a variety of native and invasive grasses and herbs included giant bulrush (*Sciurpus* spp.), *Carex* spp. water plantain (*Alisma* spp.), narrow-leaf cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*), and common reed (*Phragmites australis*). Scrub-shrub wetlands consist of species such as sandbar willow (*Salix exigua*), gray dogwood (*Cornus racemosa*), serviceberry (*Amelanchier arborea*), and green ash (*Fraxinus pennsylvanica*). Forested wetlands are primarily dominated by eastern cottonwood (*Populus deltoides*), sandbar willow, American elm (*Ulmus americana*), and red maple.

MI3.10.1.2 Environmental Consequences

Proposed Action

Surface Water

Under the Proposed Action at the 127 WG at Selfridge ANGB, construction and modification projects to support beddown of the F-35A would have the potential to impact surface water resources. As identified in Table MI2.1-2, new construction would consist of several separate projects resulting in up to 104,000 SF (2.4 acres) of new construction footprint, including up to 59,400 SF (1.4 acre) new impervious surface. Several of the projects have more than one option but only one option would be selected for each project. The total construction footprint analyzed represents the largest possible footprint of each of the options (Table MI2.1-2). These proposed construction projects would meet all criteria specified in ANG Handbook 32-1084, *Facility Space Standards*.

The collective area impacted by the proposed construction activity would exceed 1 acre in size and therefore Michigan would require a Construction Stormwater General Permit. In addition, for projects greater than 1 acre or within 500 feet of the water's edge of any lake, stream, or drain, a Soil Erosion and Sedimentation Control permit must be obtained from Macomb County. At this point, the permitted activity will be deemed to have automatic stormwater coverage from the state (127 WG 2015a). A Construction Stormwater General Permit would be obtained prior to construction and this would require approval of a site-specific SWPPP and NOI. A site-specific Spill Prevention, Control, and Countermeasures Plan would also be in place prior to the start of construction.

The sources of impacts from construction would be limited to the area of ground disturbance at any one time and the duration of construction at each distinct project site, and runoff would only be likely to occur during and following a precipitation event. The site-specific SWPPP would include measures to minimize potential impacts associated with stormwater runoff during construction, including BMPs and standard erosion control measures. These measures include straw bales, sandbags, silt fencing, earthen berms, use of tarps or water spraying, soil stabilization, temporary sedimentation basins, and re-vegetation with native plant species, where possible, to decrease erosion and sedimentation.

In accordance with UFC 3-210-10, *Low Impact Development* (LID) (as amended, 2016) and EISA Section 438, any temporary increase in surface water runoff as a result of the proposed construction would be attenuated through the use of temporary and/or permanent drainage management features. Under these requirements, federal facility projects with over 5,000 SF of new impervious surface must maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

In addition, the existing SWPPP (127 WG 2015a) for the base would be amended as necessary to reflect post-construction operations and potentially new BMPs. This SWPPP provides a management and engineering strategy to improve the quality of stormwater runoff from the 127 WG at Selfridge ANGB and thereby improve the quality of the receiving waters. Although there would be a small increase in runoff volumes and rates associated with the additional impervious areas under this alternative, the stormwater management system would be designed in compliance with applicable stormwater regulations. In addition, the 127 WG at Selfridge ANGB is currently in compliance with the permit issued by the EGLE, Surface Water Division and proposed facility designs would continue to follow the existing permit conditions such that no adverse impacts to water quality would result.

Implementation of these measures, as necessary and appropriate, would ensure that impacts to surface water under the Proposed Action at the 127 WG at Selfridge ANGB would not be significant.

Groundwater

Construction activities and operations under this alternative would include stormwater runoff protection measures that would also serve to protect groundwater quality. By adhering to the provisions of the Soils Erosion and Sedimentation Control permit and construction general permit; implementing BMPs; and amending the existing SWPPP, there would be a reduction in stormwater pollutant loading potential and thus a reduction in pollution loading potential to the underlying groundwater basins. Site grading and construction activities would also not reach depths at which groundwater would be affected. Personnel numbers would increase by approximately 85 under the Proposed Action at Selfridge ANGB. Therefore, there would be a minor increase in demand on potable water supplies.

Implementation of stormwater runoff protection measures, as necessary and appropriate, would ensure that impacts to groundwater under the Proposed Action at Selfridge ANGB would not be significant.

<u>Floodplains</u>

Several of the proposed sites are located in the 100-year floodplains as delineated by FEMA (Figure MI3.10-2). Many of these proposed sites would replace existing structures that are already located within the 100-year floodplain; however, these structures are not located in an active floodway (i.e., active river channel) so development in this area would be meet the "minor" category by the EGLE (EGLE 2018). In compliance with the current building codes in Michigan, all new construction or substantially improved buildings within the 100-year floodplain would have the lowest floor elevated at least one-foot above the 100-year flood elevation (EGLE 2018). The development, issuance, and analysis provided by this EIS constitutes compliance of EO 11988. Executive Order (EO) 11988 requires that agencies evaluate the potential effects of actions within a floodplain and to avoid floodplains unless the agency determines there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a planning process is followed to ensure compliance with EO 11988. Additionally, no structures would impede the conveyance of flood waters, decrease floodplain capacity, increase flood elevations, frequencies, or durations. As discussed under surface water, predevelopment hydrology would be maintained through compliance with LID and EISA and there would be no substantial increase in stormwater runoff. Therefore, impacts to flooding that would result from construction activities or operations under the Proposed Action at Selfridge ANGB would not be significant.

Wetlands

Twenty-eight jurisdictional wetlands have been delineated on Selfridge ANGB. However, none of the areas designated for proposed construction projects occur within these wetlands. Therefore, construction activities would have no impact on wetlands (Figure MI3.10-2).

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Water resources would be expected to remain as described under affected environment in Section MI3.10.1.1. Therefore, there would be no significant impacts to water resources under the No Action Alternative.



Figure MI3.10-2. Water Resources and Wetlands within the Vicinity of the Proposed Construction at Selfridge ANGB

MI3.10.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for water resources was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance or construction would occur.

MI3.10.3 Summary of Impacts

Under the Proposed Action at Selfridge ANGB, proposed construction would result in up to 104,000 SF (2.4 acres) of new construction footprint, including up to 59,400 SF (1.4 acre) of new impervious surface. Site-specific SWPPPs would be prepared for each construction project to ensure that runoff would be contained on-site. Predevelopment hydrology would be maintained through compliance with LID and EISA. BMPs would continue to be implemented to minimize impacts to both surface water and groundwater. Several of the proposed construction projects are located within the 100-year floodplain; though many existing structures are also within the floodplain. There is no practicable alternative to the location of these structures. None of the proposed beddown of the F-35A at Selfridge ANGB would not be significant.

MI3.11 BIOLOGICAL RESOURCES

MI3.11.1 Installation

MI3.11.1.1 Affected Environment

Vegetation

The majority of the installation (86 percent) is comprised of developed areas, landscaped areas such as lawns, ornamental trees, or maintained open fields of grass. The remaining portion of the installation is comprised of forest or open woodland (11 percent), shrubland and grassland (< 1 percent), and water (3 percent). A total of six natural vegetative communities (301 acres), two semi-natural vegetative communities (53 acres), and four developed vegetation (human-maintained) communities (2,016 acres) were documented on Selfridge ANGB during surveys conducted in 2014. The six natural communities include Midwestern White Oak - Red Oak Forest (*Quercus alba - Quercus rubra - Carya ovata*), Silver Maple - Elm Forest (*Acer saccharinum - Fraxinus pennsylvanica - Ulmus americana*), Maple - Ash - Elm Swamp Forest (*Acer [rubrum, saccharinum] - Fraxinus* spp. - *Ulmus americana*), Beech - Hardwoods Till Plain Flatwoods (*Fagus grandifolia - Acer saccharum - Quercus bicolor - Acer rubrum*), Aspen - Balsam Poplar Lowland Forest (*Populus tremuloides - Populus balsamifera*), and Bulrush - Cattail - Bur-reed Shallow Marsh (*Schoenoplectus tabernaemontani - Typha* spp. - *Sparganium* spp., *Juncus* spp.) (MIANG 2016).
Wildlife

The upland and wetland communities on 127 WG installation provide habitat for a variety of animal species. Common bird species observed on the installation include the great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), yellow warbler (*Setophaga petechial*), grasshopper sparrow (*Ammodramus savannarum*), song sparrow (*Melospiza melodia*), and American goldfinch (*Spinus tristis*). Common reptiles and amphibians include the northern leopard frog (*Lithobates pipiens*) and the eastern garter snake (*Thamnophis radix radix*). Common mammals include the eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), eastern gray squirrel (*Sciurus carlinensis*), fox squirrel (*Sciurus niger*), muskrat (*Ondatra zibethicus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and white-tailed deer (*Odocoileus virginianus*) (NGB 2016).

Threatened, Endangered, and Special Status Species

No federally-listed species have been observed on the 127 WG installation; however, five have the potential to occur within the vicinity of the 127 WG (one bird, two invertebrates, one mammal, and one reptile/amphibian). Three state-listed species were observed on the base during surveys conducted in the summer and fall of 2015 for listed wildlife species at the 127 WG installation. These species include the short-eared owl (*Asio flammeus*), peregrine falcon (*Falco peregrinus*), and common loon (*Gavia immer*). Three of the eight target listed species were observed at the 127 WG during these surveys in 2015 (peregrine falcon, short-eared owl, and common loon). The common loon was observed on the near shore of Lake St. Clair. The short-eared owl was observed at the North Approach and South Approach areas, in the large open field to the south of the base marina, and in the vicinity of the two large fish hatchery ponds adjacent to Lake St. Clair. Peregrine falcons were observed in the North Approach area, in an area of the airfield immediately south of the ammunition supply facility, and in an area of the airfield about 500 feet south of the Selfridge Air Museum.

An additional 36 state-listed species (8 birds, 8 invertebrates, 6 fish, 2 reptiles/amphibians, and 12 plants) have the potential to occur within the vicinity of the 127 WG (Table MI3.11-1). In addition, 19 migratory birds that occur on the U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern list have the potential to occur on the 127 WG (Table MI3.11-2).

Table MI3.11-1. Federally- and State-Listed Species Potentially Occurring within SelfridgeANGB and Under the Airspace
(Page 1 of 2)

Common Name Scientific Name		Status	Potential Occurrence on Selfridge ANGB	Potential Occurrence Under the Airspace
Birds		U	1	<u> </u>
Caspian tern	Hydroprogne caspia	ST	-	Р
Cerulean warbler	Setophaga cerulean	ST	_	Р
Common gallinule	Gallinula galeata	ST	-	Р
Common loon	Gavia immer	ST	0	Р
Common tern	Sterna hirundo	ST	Р	Р
Forester's tern	Sterna forester	ST	Р	Р
Henslow's sparrow	Ammodramus henslowii	SE	-	Р
King rail	Rallus elegans	SE	Р	Р
Kirtland's warbler	Setophaga kirtlandii	E, SE	-	Р
Least bittern	Ixobrychus exilis	ST	-	Р
Long-eared owl	Asio otus	ST	Р	-
Louisiana waterthrush	Parkesia motacilla	ST	-	Р
Merlin	Falco columbarius	ST	-	Р
Migrant loggerhead shrike	Lanius ludovicianus migrans	SE	-	Р
Peregrine falcon	Falco peregrinus	SE	0	-
Piping plover	Charadrius melodus	E, SE	-	Р
Prairie warbler	Setophaga discolor	SE	-	Р
Red knot	Calidris canutus rufa	Т	Р	Р
Red-shouldered hawk	Buteo lineatus	ST	Р	Р
Short-eared owl	Asio flammeus	SE	0	-
Trumpeter swan	Cygnus buccinators	ST	-	Р
Invertebrates				
American burying beetle	Nicrophorus americanus	EXP	Р	N/A
Black sandshell	Ligumia recta	SE	Р	N/A
Eastern pondmussel	Ligumia nasuta	SE	Р	N/A
Hickorynut	Obovaria olivaria	SE	Р	N/A
Lillyput	Toxolasma parvum	SE	Р	N/A
Rayed bean	Villosa fabalis	E, SE	Р	N/A
Round hickorynut	Obovaria subrotunda	SE	Р	N/A
Slippershell	Alasmidonta viridis	ST	Р	N/A
Snuffbox	Epioblasma triquetra	SE	Р	N/A
Wavyrayed lampmussel	Lampsilis fasciola	ST	Р	N/A
Fish				
Channel darter	Percina copelandi	SE	Р	N/A
Eastern sand darter	Ammocrypta pellucida	ST	Р	N/A
Lake sturgeon	Acipenser fulvescens	ST	Р	N/A
Mooneye	Hiodon tergisus	ST	Р	N/A
Pugnose shiner	Notropis anogenus	SE	Р	N/A
River darter	Percina shumardi	SE	Р	N/A
Mammals				
Indiana bat	Myotis sodalist	E	Р	Р
Northern long-eared bat	Myotis septentrionalis	T ST	Р	Р

Table MI3.11-1. Federally- and State-Listed Species Potentially Occurring within SelfridgeANGB and Under the Airspace(Page 2 of 2)

(1 4 5 2 4 1 2)				
Common Name	Scientific Name	Status	Potential Occurrence on Selfridge ANGB	Potential Occurrence Under the Airspace
Reptiles and Amphibians				
Eastern fox snake	Pantherophis gloydi	ST	Р	Р
Eastern massasauga	Sistrurus catenatus	Т	Р	Р
Six-lined racerunner	Aspidoscelis sexlineata	ST	-	Р
Spotted turtle	Clemmys guttata	ST	Р	Р
Plants				
Downy gentian	Gentiana puberulenta	SE	Р	N/A
False hop sedge	Carex lupuliformis	ST	Р	N/A
Goldenseal	Hydrastis canadensis	ST	Р	N/A
Heart-leaved plantain	Plantago cordata	SE	Р	N/A
Lake cress	Rorippa aquatic	ST	Р	N/A
Gattinger's gerardia	Agalinis gattingeri	SE	Р	N/A
Orange-fringed orchid	Platanthera ciliaris	SE	Р	N/A
Panicled hawkweed	Hieracium paniculatum	ST	Р	N/A
Pumpkin ash	Fraxinus profunda	ST	Р	N/A
Rosinweed	Silphium integrifolium	ST	Р	N/A
Showy orchis	Galearis spectabilis	ST	Р	N/A
Stiff gentian	Gentianella quinquefolia	ST	Р	N/A

Notes:ANGB = Air National Guard Base; E = Federally Endangered; ESP = Experimental population, nonessential;
N/A = not applicable; O = Observed; P = Potential; SE = State Endangered; ST = State Threatened; T= Federally
Threatened; U = Unlikely.

Source: USFWS 2017, 2018; Michigan Department of Agriculture and Rural Development 2018; Michigan Natural Features Inventory 2018.

Common Name	Scientific Name	Season	Potential Occurrence on Selfridge ANGB	Potential Occurrence Under the Airspace
American bittern	Botaurus lentiginosus	Breeding	Р	Р
American golden-plover	Pluvialis dominica	Spring/Fall	Р	Р
Bald eagle	Haliaeetus leucocephalus	Breeding	Р	Р
Black tern	Chlidonias niger	Breeding	Р	Р
Black-billed cuckoo	Coccyzus erythropthalmus	Breeding	Р	Р
Bobolink	Dolichonyx oryzivorus	Breeding	Р	Р
Cape May warbler	Dolichonyx oryzivorus	Breeding	-	Р
Connecticut warbler	Oporornis agilis	Breeding	-	Р
Eastern whip-poor-will	Anstrostomus vociferous	Breeding	Р	Р
Evening grosbeak	Coccothraustes vespertinus	Breeding	-	Р
Golden eagle	Aquila chrysaetos	Winter	Р	Р
Golden-winged warbler	Vermivora chrysoptera	Breeding	Р	Р
Harris's sparrow	Ammodramus henslowii	Spring	-	Р
Henslow's sparrow	Ammodramus henslowii	Breeding	Р	Р
King rail	Rallus elegans	Breeding	-	Р
Least bittern	Ixobrychus exilis	Breeding	Р	Р
Lesser yellowlegs	Tringa flavipes	Spring/Summer	Р	Р
Long-eared owl	Asio otus	Breeding	Р	Р
Olive-sided flycatcher	Contopus cooperi	Breeding	-	Р
Red-headed woodpecker	Melanerpes erythrocephalus	Breeding	Р	Р
Rusty blackbird	Euphagus carolinus	Spring/Fall	Р	Р
Semipalmated sandpiper	Calidris pusilla	Spring/Summer	Р	Р
Short-billed dowitcher	Limnodromus griseus	Spring/Summer	Р	Р
Snowy owl	Bubo scandiacus	Spring/Fall/Winter	-	Р
Whimbrel	Numenius phaeopus	Spring/Summer	-	Р
Willow flycatcher	Epidonax traillii	Breeding	Р	Р
Wood thrush	Hylocichla mustelina	Breeding	Р	Р

Table MI3.11-2. Migratory Birds that Could Potentially Occur within Selfridge ANGB and Under the Airspace

Notes: O = Observed; P = Potential; U = Unlikely. *Source*: USFWS 2017, 2018.

MI3.11.1.2 Environmental Consequences

Proposed Action

Vegetation

Construction of new facilities associated with the Proposed Action Alternative at the 127 WG installation would occur primarily on currently paved areas or actively managed (i.e., mowed and landscaped) areas, and would result in a maximum increase of 59,400 SF (1.4 acre) of impervious surfaces. Impacts to the vegetation at the installation would not be significant due to the lack of sensitive vegetation in the project area.

<u>Wildlife</u>

Noise associated with construction may cause wildlife to temporarily avoid the area, including those that are protected under the Migratory Bird Treaty Act (MBTA). Noise associated with construction activities, as well as an increase in general industrial activity and human presence, could evoke reactions in birds. Disturbed nests in the immediate vicinity of construction activity would be susceptible to abandonment and depredation. Additional analysis for noise impacts to biological resources can be found in Appendix B, *Noise Modeling, Methodology, and Effects*. However, bird and wildlife populations in the vicinity of the airport where project components would occur are accustomed to elevated noise associated with aircraft and general military industrial use. As a result, indirect impacts from construction noise would not be significant because the ambient noise levels within the vicinity are high under the affected environment and would be unlikely to substantially increase by the relatively minor and temporary nature of the proposed construction and modifications.

Operational noise levels under the Proposed Action Alternative at the 127 WG installation would be expected to increase from the affected environment with the conversion to the F-35A aircraft. Total annual airfield operations at the 127 WG installation are proposed to increase by 1,648 (8 percent). Under the Proposed Action at the 127 WG installation, only the number of aircraft operations would change; there would be no change in where or when individual aircraft operate. In addition, an additional 1,160 acres of land off the airport property would be exposed to DNL greater than 65 dB. The majority of this area would be commercial/manufacturing and residential areas. Changes in operational noise are not expected to impact terrestrial species in the area because species on and near the installation are likely accustomed to elevated noise levels associated with aircraft and military operations.

An increase in airfield operations may result in a slight increased opportunity for bird/wildlife aircraft strikes to occur, including those with migratory birds. Adherence to the existing BASH program would minimize the risk of bird/wildlife aircraft strikes (see Section MI3.4, *Safety*). The 127 WG has developed procedures designed to minimize the occurrence of bird/wildlife aircraft strikes, and has documented detailed procedures to monitor and react to heightened risk of bird/wildlife aircraft strikes. When risk increases, limits are placed on low-altitude flight and some types of training (e.g., multiple approaches, closed pattern work) in the airport environment. Special briefings are provided to pilots whenever the potential exists for increased bird/wildlife aircraft strikes within the airspace.

Threatened, Endangered, and Special Status Species

Impacts to potentially occurring threatened, endangered, or candidate species on Selfridge ANGB would be similar to those described under wildlife. That is, studies indicate that wildlife species,

whether they are common or protected species, already occupying lands exposed to airfield noise are generally not affected by slight to moderate increases in ambient noise levels, as they have already habituated to periodic to frequent loud overflight noise. No federally-listed species have been observed on the installation. As a result, there would be no impacts to federally-listed species from implementation of the Proposed Action Alternative at the 127 WG installation. Three special status species occur on the installation: common, loon, peregrine falcon, and short-eared owl. Annual airfield operations at the 127 WG installation are projected to increase. However, noise from proposed construction and operations is not expected to affect these species since they are likely accustomed to elevated noise levels associated with current aircraft and military operations. Military readiness operations are exempt from the prohibitions of the MBTA, provided they do not result in a significant adverse effect on population of migratory bird species. Regardless, migratory birds occurring on the base would not be expected to be impacted by the Proposed Action Alternative at the 127 WG installation since they would already be habituated to aircraft noise from existing operations. An increase in airfield operations may result in a slight increased opportunity for bird/wildlife aircraft strikes to occur, including those with migratory birds. However, adherence to the existing BASH program would minimize the risk of bird/wildlife aircraft strikes (see Section MI3.4, Safety).

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 127 WG installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Biological resources would remain as described in the affected environment in Section MI3.11.1.1. Therefore, there would be no significant impacts to biological resources as a result of the No Action Alternative.

MI3.11.2 Airspace

MI3.11.2.1 Affected Environment

Due to the nature of the actions proposed within the airspace, plant species were excluded from extensive review and analysis because the proposed activities would not result in new ground disturbance, and ordnance delivery and chaff and flare use would not exceed current levels and would occur in locations already used and authorized for those purposes. In addition, marine species, invertebrates, and fish were excluded from review and analysis as they, too, would not likely be impacted by the Proposed Actions.

Wildlife

The airspace associated with 127 WG operations covers over 16,735 square miles of land within Michigan. Wildlife habitat within the airspace is comprised primarily of the Eastern Broadleaf Forest (Continental) Province and Laurentian Mixed Forest Province. The Eastern Broadleaf Forest (Continental) Province is dominated by broadleaf deciduous forest, favoring the drought-resistant oak-hickory association. The Laurentian Mixed Forest Province is a transitional zone that consists of mixed stands of a few coniferous species (mainly pine) and a few deciduous species (mainly yellow birch [*Betula alleghaniensis*], sugar maple [*Acer saccharum*], and American beech [*Fagus grandifolia*]); the rest is a mixture of pure deciduous forest (Bailey 1995).

Common mammal species associated within the Eastern Broadleaf Forest (Continental) Province include the gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), and eastern chipmunk (*Tamias striatus*). Common birds include the blue jay (*Cyonocitta cristata*), summer tanager (*Piranga rubra*), scarlet tanager (*Piranga olivacea*), rose-breasted grosbeak (*Pheucticus ludovicianus*), ovenbird (*Seiurus aurocapilla*), and wild turkey. Common mammal species associated within the Laurentian Mixed Forest Province include the snowshoe hare (*Lepus americanus*), black bear, striped skink (*Mephitis mephitis*), chipmunk, badger (*Taxidea taxus*), striped ground squirrel (*Xerus erythropus*), beaver (*Castor canadensis*), and muskrat (*Ondatra zibethicus*). Common birds include the ptarmigan (*Lagopus leucura*), white-throated sparrow (*Zonotrichia albicollis*), dark-eyed junco (*Junco hyemalis*), and yellow-bellied sapsucker (*Sphyrapicus varius*) (Bailey 1995).

Threatened, Endangered, and Special Status Species

Table MI3.11-1 lists federally threatened, endangered, candidate, and state-listed species observed or potentially occurring under the proposed airspace. Six federally-listed species (3 birds, 2 mammals, and 1 reptile/amphibian) and 18 additional state-listed species (15 birds and 3 reptiles/amphibians) have been observed or potentially occur under the proposed airspace. Critical habitat for the piping plover is located under the airspace. In addition, 27 migratory birds that occur on the USFWS Birds of Conservation Concern list have the potential to occur under the airspace (see Table MI3.11-2).

MI3.11.2.2 Environmental Consequences

Proposed Action

Wildlife

No construction would occur beneath the training airspace; however, inert ordnance would be deployed in ranges authorized for their use. Existing range management procedures and vegetation

removal guidelines would be adhered to and vegetation management measures currently in place would persist. Impacts to wildlife habitat would be negligible. The only identified defensive countermeasure that would be employed by the F-35A with the potential to affect wildlife habitat is chaff and flares. Chaff and flare deployment would be expected to be approximately the same or decrease from current levels conducted by A-10 aircraft and would occur within the same training areas. Current restrictions on the amount or altitude of chaff and flare use would continue to apply. As a result, chaff and flare deployment associated with the Proposed Action Alternative would have no impact on wildlife habitat.

Impacts to migratory birds protected under the MBTA would be negligible. In general, animal responses to aircraft noise appear to be somewhat dependent on, or influenced by, the size, shape, speed, proximity (vertical and horizontal), engine noise, color, and flight profile of planes. Some studies showed that animals that had been previously exposed to jet aircraft noise exhibited greater degrees of alarm and disturbance to other objects creating noise, such as boats, people, and objects blowing across the landscape. Other factors influencing response to jet aircraft noise may include wind direction, speed, and local air turbulence; landscape structures (i.e., amount and type of vegetative cover); and in the case of bird species, whether the animals are in the incubation/nesting phase. Additional analysis for noise impacts to biological resources can be found in Appendix B, *Noise Modeling, Methodology, and Effects*. Noise modeling results suggest subsonic noise levels would increase from 5 to 9 dB within the airspace and would be up to 58 L_{dnmr}; well below the 112 dB shown to elicit major biological responses. Impacts to migratory birds under the MBTA would not be significant.

Section MI3.4, *Safety* established that bird aircraft strikes are currently rare in the airspace and would not be expected to increase substantially under the Proposed Action Alternative at the 127 WG installation. The F-35A would fly predominantly above 5,000 feet AGL, which is above where 95 percent of strikes occur. Adherence to the BASH Plan would further reduce the likelihood of bird strike in training airspace.

Overall, impacts to wildlife from proposed changes in subsonic and supersonic operations would not be significant for the following reasons: 1) the probability of an animal or nest experiencing overflights more than once per day would be low due to the random nature of flight within the airspace and the large area of land overflown; 2) generally speaking, the F-35A would fly at higher altitudes than F-16 aircraft—the majority (98 percent) of the F-35A operations would occur above 5,000 feet AGL; 3) supersonic flight would only occur above 15,000 feet MSL in the airspace, with 90 percent of these supersonic events above 30,000 feet MSL; and 4) although the total number of supersonic flights and sonic booms occurring would increase from current levels under this alternative, there would only be an increase of dB CDNL ranging from 1 to 2 across airspace units, with a maximum level at 47 dBC CDNL. In addition, studies of supersonic noise on birds and mammals indicate that animals tend to habituate to sonic booms and long-term effects are not adverse.

Threatened, Endangered, and Special Status Species

Impacts to potentially occurring federally- or state-listed species underlying the 127 WG airspace would be similar to those described within the wildlife section. Under the Proposed Action Alternative for the 127 WG, the amount of time the 127 WG would conduct operations in the associated airspace would increase by approximately 54 percent. However, the F-35As would fly higher than A-10s, which would reduce the potential to impact species.

Overall, impacts to federally- and state-listed species from the proposed change in subsonic and supersonic operations would not be adverse for the following reasons: 1) the probability of an animal or nest experiencing overflights more than once per day would be low due to the random nature of flight within the airspace and the large area of land overflown; 2) generally speaking, the F-35A would fly at higher altitudes than F-16 aircraft—the majority (98 percent) of the F-35A operations would occur above 5,000 feet AGL; 3) supersonic flight would only occur above 15,000 feet MSL in the airspace, with 90 percent of these supersonic events above 30,000 feet MSL; and 4) although the total number of supersonic flights and sonic booms occurring would increase from current levels under this alternative, there would only be an increase of dB CDNL ranging from 1 to 2 across airspace units, with a maximum level at 47 dBC CDNL. In addition, studies of supersonic noise on birds and mammals indicate that animals tend to habituate to sonic booms and long-term effects are not adverse. Impacts to federally-listed species would not be significant.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 127 WG installation and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Biological resources would remain as described in the affected environment in Section MI3.11.2.1. Therefore, there would be no significant impacts to biological resources as a result of the No Action Alternative.

MI3.11.3 Summary of Impacts

No sensitive vegetation exists at Selfridge ANGB, and so construction activities would not affect the flora on base. Noise associated with construction activities and/or aircraft operations would not affect wildlife or threatened and endangered species, as they are likely habituated to a relatively noisy environment already. Anticipated changes to use of the SUA would not be expected to impact biological resources. Impacts to biological resources as a result of the beddown of the F-35A at Selfridge ANGB would not be significant.

MI3.12 CULTURAL RESOURCES

MI3.12.1 Installation

MI3.12.1.1 Affected Environment

Archaeological Resources

The 127 WG installation covers 3,075 acres and approximately 724 acres have been previously surveyed for archaeological resources. The remaining 2,351 acres that have not been surveyed are primarily part of the built environment, including paved and landscaped areas. Three previously conducted archaeological surveys have been completed within undeveloped or minimally developed areas at the Selfridge ANGB. As a result of these surveys, 12 archaeological sites have been identified. These sites include one historic scatter, seven prehistoric lithic scatters, two multi-component surface scatters, one prehistoric occupation with possible burials, and one possible village with circular earthworks. Nine of these sites have been evaluated for National Register of Historic Places (NRHP) eligibility and it was determined they are not eligible for listing (NGB 2011, 2017b).

Architectural Resources

Selfridge ANGB includes approximately 530 buildings and structures. A comprehensive cultural resources survey of Selfridge ANGB was completed in 2017 and included an inventory and reevaluation of all resources built prior to 1991 located at the installation. A total of 180 buildings were surveyed and reevaluated. Of the 180 buildings, 100 of them were constructed between 1928 and 1937, 9 were built during the World War II-era (1939–1945), and the remaining 71 buildings were constructed during the Cold War-era (1946–1991). None of the surveyed buildings were recommended eligible for listing as individual historic properties. However, 96 buildings were recommended as contributing resources to two separate historic districts. One historic district includes 27 buildings from the 1930s cantonment area, the 1940s pump stations, and runway and taxiway alignments. The second historic district consists of 69 buildings that are the 400-series officer housing (NGB 2017b). The NGB is consulting with the Michigan SHPO on these eligibility determinations.

An inventory and evaluation of post-1991 buildings and structures at Selfridge ANGB was recently undertaken (NGB 2018a). Fifty post-1990 buildings and structures at the installation were documented. The surveyed resources include storage, defense, transportation, personnel, communications, administration, research, and industrial facilities. The current inventory and evaluation recommended that the surveyed architectural resources, either individually or collectively as a historic district, are not eligible for inclusion in the NRHP (NGB 2018a). The NGB is consulting with the Michigan SHPO on the eligibility determination.

Traditional Resources

Selfridge ANGB contains no known traditional resources; however, 12 federally-recognized Tribes and two state Tribes that are historically, culturally, and linguistically affiliated with the area have been identified. The federally-recognized Tribes include Bay Mills Chippewa Indian Community, Grand Traverse Bay Band of Ottawa and Chippewa Indians, Hannahville Potawatomi Indian Community, Huron Potawatomi-Nottawaseppi Huron Band of Potawatomi, Keweenaw Bay Indian Community, Lac Vieux Desert Band of Lake Superior Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Band of Ottawa Indians, Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan, Pokagon Band of Potawatomi Indians, Saginaw Chippewa Indian Tribe, and Sault Ste. Marie Tribe of Chippewa Indians. The state Tribes are the Burt Lake Band of Ottawa and Chippewa Indians and The Grand River Bands of Ottawa Indians.

MI3.12.1.2 Environmental Consequences

Proposed Action

Potential direct impacts to cultural resources examined in this analysis include effects of grounddisturbing activities during construction or modification to existing buildings. Indirect impacts from an increase in personnel from 1,413 to 1,498 would be negligible as personnel would primarily be confined to the developed areas on the installation, which lack cultural resources.

Archaeological Resources

Three previously conducted archaeological surveys were completed within undeveloped or minimally developed areas at the Selfridge ANGB. Nine of the 12 previously recorded archaeological sites have been evaluated for NRHP eligibility and they were determined not eligible for listing in the NRHP (NGB 2011, 2017b). None of these sites are located within the proposed construction footprints. It is not expected that undiscovered cultural resources would be found during implementation of the Proposed Action at Selfridge ANGB; however, in the event of an inadvertent discovery during ground-disturbing operations, the following specific actions would occur. The project manager would cease work immediately and the discovery would be reported to the 127 WG environmental manager, who would secure the location with an adequate buffer and notify the Commander and the NGB cultural resources manager. The environmental manager would then continue to follow ANG Inadvertent Discovery protocol (NGB 2011). Under these conditions, there would be no adverse effects to archaeological resources with implementation of this alternative.

Architectural Resources

Ten buildings (Buildings 3, 5, 18, 34, 103, 117, 120, 140, 154, and 171) at the 127 WG are proposed for additions, infrastructure improvements, and interior renovations. The 127 WG would demolish Building 171 in order to build a new flight simulator building. Building 18 would be demolished and a new Maintenance Shop and Maintenance Group would be built in its location; however, this would occur if other construction options are chosen. Buildings 3, 5, 117, 120, and 140 were previously inventoried and evaluated (NGB 2017b). The NGB determined these five buildings were eligible for listing in the NRHP and are contributing to the Cantonment Area Historic District (NGB 2017b). A programmatic agreement between the NGB, 127 WG of the MIANG, Advisory Council on Historic Preservation, and the Michigan SHPO was signed in 2002 regarding the operations and maintenance activities at Selfridge ANGB (NGB 2002). These five buildings (3, 5, 117, 120, and 140) are considered historic properties. Per the programmatic agreement (NGB 2002), the NGB is in the process of consulting with the SHPO concerning the additions and renovations to these buildings. Interior renovations listed in Appendix E of the programmatic agreement would not affect the historic character of the Selfridge ANGB if they follow the most current version of the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service 1990).

Buildings 18, 34, 103, 154, and 171 were previously inventoried and evaluated and were determined not eligible for listing in the NRHP (NGB 2011). As stated in the programmatic agreement, depending on the construction options chosen, the NGB would consult with the Michigan SHPO regarding the demolition of Buildings 18 and 171 (NGB 2002). Under these conditions, there would be no adverse effects to architectural resources as a result of implementation of this alternative.

Traditional Resources

No traditional resources have been identified at Selfridge ANGB and the highly developed nature of the installation makes it unlikely to contain any such resources (NGB 2011). Government-to-government consultation between the NGB and each federally- and state-recognized Tribe associated with the 127 WG is being conducted for this action, to provide information regarding Tribal concerns per Section 106 of the NRHP as well as information on traditional resources that may be present on or near the installation. An initial phone call to Tribal offices to verify contact information and current Senior-level Tribal Officials before any materials were mailed to the American Indian Tribe was completed in late October/early November 2017. An initial government-to-government consultation letter was sent to the 12 federally-recognized American Indian Tribes and 2 state-recognized American Indian Tribes with ancestral ties to the Selfridge ANGB. After the initial government-to-government consultation letter was sent, NGB followed up with telephone calls and emails in an effort to increase accessibility and encourage

communication in the event an American Indian Tribe would have any concerns regarding the Proposed Action. The Keweenaw Bay Indian Community provided a response via e-mail. To date, no other responses have been received from the federally- and state-recognized Tribes associated with Selfridge ANGB.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at the 127 WG installation, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Cultural resources would be expected to remain as described under affected environment in Section MI3.12.1.1. Therefore, there would be no significant impacts to cultural resources under the No Action Alternative.

MI3.12.2 Airspace

MI3.12.2.1 Affected Environment

There are 47 NRHP-listed cultural resources located under the airspace used by the 127 WG, including private residences, businesses, courthouses, a lighthouse, light stations, churches, fishing boats, historic districts, and bridges (National Park Service 2014). No American Indian reservations underlie the airspace and no traditional cultural properties are known within this area.

Government-to-government consultation between the NGB and each federally- and staterecognized Tribe associated with lands under the airspace is being conducted for this action to provide information regarding Tribal concerns per Section 106 of the NRHP as well as information on traditional resources that may be present on or near the installation. An initial phone call to Tribal offices to verify contact information and current Senior-level Tribal Officials before any materials were mailed to the American Indian Tribe was completed in late October/early November 2017. An initial government-to-government consultation letter was sent to 12 federally-recognized American Indian Tribes and 2 state-recognized American Indian Tribes with ancestral ties to the lands beneath the associated airspace in February 2018. These 12 federallyrecognized American Indian Tribes included Grand Traverse Band of Ottawa and Chippewa Indians, Hannahville Potawatomi Indian Community, The Nottawaseppi Huron Band of Potawatomi, The Keewanaw Bay Indian Community, Lac Vieux Desert Band of Lake Superior Chippewa Indians, The Sault Ste. Marie Tribe of Chippewa Indians, The Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan, The Pokagon Band of Potawatomi Indians, Saginaw Chippewa Indian Tribe, Bay Mills Chippewa Indian Community. The two state-recognized American Indian

Tribes included The Burt Lake Band of Ottawa and Chippewa and The Grand River Bands of Ottawa Indians.

After the initial government-to-government consultation letter was sent, NGB followed up with telephone calls and emails in an effort to increase accessibility and encourage communication in the event an American Indian Tribe would have any concerns regarding the Proposed Action or land below the affected airspace areas. Correspondence sent to the Tribes is located in Appendix A. No American Indian reservations underlie the airspace associated with the Selfridge ANGB.

The Keweenaw Bay Indian Community provided a response via e-mail. To date, no other responses have been received from the federally- and state-recognized American Indian Tribes with ancestral lands beneath the associated airspace at Selfridge ANGB.

MI3.12.2.2 Environmental Consequences

Proposed Action

Under the Proposed Action for the 127 WG, the amount of time the 127 WG would conduct operations in the associated airspace would increase by approximately 54 percent. However, the F-35As would also fly higher than F-16s, which would reduce the potential to impact cultural resources. These changes would be a continuation of existing operations within the area and would not result in a change in setting to any eligible or listed archaeological, architectural, or traditional cultural property.

Changes in L_{dnmr} would be the greatest in the Pike E MOA with an increase in subsonic noise of 9 dB L_{dnmr} . However, even with this increase, the overall L_{dnmr} would remain 44 dB. All other subsonic noise in the other MOAs would have an L_{dnmr} at 58 or less dB. Supersonic noise would increase up to 2 dBC, although the CDNL would remain low at 47 dBC or below.

No damage to historic structures is anticipated because overpressures would not exceed current levels found with the A-10s using the airspace (2.5 pounds per square foot [psf]). Impacts to structures would not be significant at this level of psf (Battis 1988; Haber and Nakaki 1989).

Visual intrusions under the Proposed Action would be minimal and would not represent an increase sufficient to cause adverse impacts to the settings of cultural resources. Due to the high altitude of the overflights, small size of the aircraft, and the high speeds, the aircraft would not be readily visible to observers on the ground.

No additional ground disturbance would occur under the airspace due to the Proposed Action. Use of ordnance and defensive countermeasures would occur in areas already used for these activities. Flares deployed from the aircraft would not pose a visual intrusion either, as flares are small in

size and burn only for a few seconds and the high relative altitude of the flights would make them virtually undetectable to people on the ground. Overall, flares are unlikely to adversely affect cultural resources. Therefore, the introduction of material to archaeological sites or standing structures from the use of flares would not have an adverse effect on these resources.

Proposed use of the airspace would be similar to ongoing training operations. Given the current use of the airspace and the nature of the proposed future use of the project area, there would be no adverse effects to NRHP-eligible or listed archaeological resources, architectural resources, or traditional cultural properties. The NGB is consulting with the Michigan SHPO on its finding of effect for the Proposed Action.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Cultural resources would remain as described in the affected environment in Section MI3.13.2.1. Therefore, there would be no significant impacts to cultural resources as a result of the No Action Alternative.

MI3.12.3 Summary of Impacts

There are no archaeological sites within any of the proposed construction footprints at Selfridge ANGB. In the event of an inadvertent discovery during ground-disturbing operations, work would cease and procedures would be implemented to manage the site prior to continuation of work. Five buildings that would be associated with proposed construction are considered eligible for listing in the NRHP and are contributing to the Cantonment Area Historic District. A programmatic agreement between the NGB, 127 WG, MIANG, Advisory Council on Historic Preservation, and Michigan SHPO exists, and the 127 WG is in coordination with SHPO regarding the building modifications that would occur. The other facilities included in the construction modifications are not eligible for the NRHP. No traditional cultural resources have been identified at Selfridge ANGB. Government-to-government consultation with associated Tribes is ongoing and will continue throughout the EIAP. Use of the SUA under the Proposed Action would be similar to ongoing operations. Impacts to cultural resources as a result of the proposed F-35A beddown at Selfridge ANGB would not be significant.

MI3.13 HAZARDOUS MATERIALS AND WASTES, AND OTHER CONTAMINANTS

MI3.13.1 Installation

MI3.13.1.1 Affected Environment

Hazardous Materials

Hazardous materials and petroleum products are used at the Selfridge ANGB by both the host and tenant units for aircraft and vehicle maintenance operations, liquid fuel services, and general housekeeping. The hazardous materials and petroleum products used include petroleum, oil, and lubricant (POL) products such as JP-8 jet fuel, motor vehicle gasoline, motor oils, greases, lubricants, diesel fuel, and heating oil (Fuel Oil No. 2); solvents, degreasers, paints, thinners, acids, bases, pesticides, and housekeeping-related cleaning products (ANG 2006).

There are currently 62 aboveground storage tanks (ASTs) greater than 55 gallons on the installation.

- Forty of the 62 ASTs are used to store diesel fuel and range in capacity from 75 to 12,000 gallons.
- Three ASTs ranging in capacity from 150 to 6,000 gallons are used to store gasoline.
- Five ASTs ranging in capacity from 150 to 1,000 gallons are used to store used oil.
- Seven ASTs ranging in capacity from 150 to 900,000 gallons are used to store Jet A fuel.
- One 1,000-gallon AST is used to store recovered fuel.
- One 275-gallon AST is used to store motor oil.
- Two ASTs ranging in capacity from 250 to 750 gallons are used to store Diesel/Motor Vehicle Gasoline.
- Three ASTs ranging in capacity from 180 to 3,000 gallons are used to store Diesel/Jet A fuel (MIANG 2017b).

There are currently two underground storage tanks (USTs) in the ground at Selfridge ANGB.

• The two active USTs are labeled 35-60 (Hangar 35) and 781-20 (Privately Owned Vehicle Gas Station). UST 35-60 is an empty 8,000-gallon emergency containment tank. UST 781-20 is a 20,000-gallon motor vehicle gasoline tank (MIANG 2017b).

In 2012, a renewable energy feasibility study was conducted to meet objectives described in the Energy Policy Act of 2005. Subsurface methane encountered during past construction activities was further investigated to determine if the methane originates from anaerobic decomposition of organic matter (biogenic methane) or if methane originates from existing Antrim Shale deposits (thermogenic methane). The 2012 investigation was inconclusive and in August 2018, a deep well

Methane Study was performed to address insufficient datum and attempt to determine subsurface methane origins. The analytical data generated indicated that methane is present in most permanent wells sampled and at all new deep (50 feet) temporary wells. Evaluation of the methane/ethane ratio indicated the methane originates from biogenic sources (127 WG 2018).

Biogenic methane is a naturally occurring gas found in marshes, bogs, landfills, and shallow sediment. Formation of methane through biogenic process takes place closer to the ground surface with the majority of methane lost to the atmosphere; however, a small amount can be trapped in shallow soil. At normal environmental concentrations, methane has no impact on human health. Built-up methane poses an explosion hazard and an asphyxiation hazard. The main environmental impact of methane is on a global scale, as a GHG. Although levels of methane in the atmosphere are relatively low, methane has a high Global Warming Potential (GWP) (USEPA 2010).

Toxic Substances

Regulated toxic substances typically associated with buildings and facilities include asbestos, LBP, and polychlorinated biphenyls (PCBs). ACM is known to occur in 48 buildings, including Buildings 7,9, 36, 45, 50, 103, 118, 126-130, 140, 165, 170, 180, 301, 310, 325, 328, 410, 697, 712, 880, 891, 970, 1010, 1011, 1025, 1030, 1051, 1060, 1405, 1409, 1414, 1416, 1420, 1424, 1426, 1428, 1505, 1506, 1515, 1519, 1533, 1534, and 1540. An extensive asbestos identification and abatement program has been in existence at Selfridge ANGB since 1991 and consists of an Asbestos Management Plan and an Asbestos Operating Plan. The Civil Engineering asbestos management team is continually updating the asbestos management program and is responsible for inspecting, repairing, and/or removing ACM at all installation owned/operated facilities (ANG 2006).

Based on the age of many of the facilities at Selfridge ANGB, a considerable number of buildings are expected to contain LBP. In order to take precaution, any buildings constructed prior to 1978 are presumed to contain LBP and would be tested for LBP prior to demolition or renovation. The Bioenvironmental Engineering section of the 127 Wing conducted a basewide LBP sampling project in 1997. This LBP survey identified 114 building on the base that tested positive for LBP (ANG 2006).

The 127 Wing manages all PCB items in accordance with USEPA regulations, including 40 CFR 761. All transformers or regulators with a known PCB content of greater than 500 parts per million have been removed from the base. Other potential PCB-contaminated equipment within the installation includes small capacitors and ballasts for light fixtures. All known PCBs and PCB-containing capacitors and ballasts not specifically labeled as PCB-free are disposed of as PCB-containing material by the Environmental Management Office. The 1994 Navy Environmental Baseline Survey also indicated that PCB-contaminated transformers may be buried

at S0004-AOC and that a hydraulic lift of unknown PCB content is located at F1426-AOC. Sites S004-AOC and F1426-AOC were investigated and EGLE concurred with No Further Action (NFA) and no Land Use Control (LUC) restrictions.

Hazardous Waste Management

The 127 Wing Final Facility Response Plan contains the governing regulations for spill prevention and describes specific protocols for preventing and responding to releases, accidents, and spills involving oils and hazardous materials (127 WG 2017c). The 127 Wing Hazardous Waste Management Plan outlines procedures for controlling and managing hazardous wastes from the point where they are generated until they are disposed. It also includes guidance for compliance with all federal, state, and local regulations pertaining to hazardous waste. In addition, the Hazardous Waste Management Plan includes a pollution prevention section that details the installation's goal of reducing hazardous waste. The Facility Response Plan, Refrigerant Management Plan, as well as the Solid Waste Management Plan, among others, support the installation pollution prevention (127 WG 2015b).

Selfridge ANGB is regulated as a Large Quantity Generator of hazardous waste and maintains USEPA Identification Number MID099113128. A hazardous waste generator point is where the waste is initially created or generated. A satellite accumulation point (SAP) is an area where hazardous waste is initially accumulated at the point of generation that is under the control of the SAP manager. Hazardous wastes initially accumulated at a SAP are accumulated in appropriate containers before being transferred to the installation central accumulation point (CAP). A generator may accumulate as much as 55 gallons of hazardous waste or one quart of acute hazardous waste at each SAP without a permit. There are 84 SAPs (where a waste is initially accumulated) on the base and the maximum volume of hazardous waste permitted at each SAP is 55 gallons or 1 quart of acute hazardous waste on the P-List from 40 CFR 261.33. If an additional SAP is needed, an area near the location where the waste is generated will be selected by the area accumulation site manager and Civil Engineering Environmental. There are two CAPs on the base located at Building 105 and 1419 where hazardous waste can accumulate in containers for up to 90 days (127 WG 2015b).

OWSs are used to separate oils, fuels, sand, and grease from wastewater and to prevent contaminants from entering the sanitary sewer and stormwater drainage systems. Currently, there are 19 active OWSs on Selfridge ANGB located at Buildings 14, 15, 24, 35, 45, 104, 117, 118, 139, 154, 190/192, 859, 1401, 1416, 1420/1421, 1422, 1428, 1436, and 3855/3857. The OWSs range in capacity from 35 to 20,000 gallons; 16 of the 19 OWSs discharge to the sanitary sewer, and the remaining 3 discharge to the storm sewer (127 WG 2015b).

Environmental Restoration Program

ERP sites have been under investigation at the 127 WG installation from 1982 to present. A total of 158 sites have been investigated, of which 18 are still active. Sites that are no longer active are closed with either Unlimited Use/Unrestricted Exposure or applicable LUCs in place for the protection of human and environmental health. The 18 active ERP sites include one site investigated under the Military Munitions Response Program (managed under the ERP), one ERP site, and 16 other sites and Areas of Concern (AOCs), which were investigated under a variety of programs (e.g., UST, AST, Resource Conservation and Recovery Act [RCRA]) and were created by different branches of the government, including the USAF, Army, Navy, Coast Guard, and the ANG.

There are two closed ERP sites with LUCs, Site 7 (SS007) and Site 21 (SS021), and one AOC, East Ramp Fuel Line (TU051), in areas of planned construction to support the proposed F-35A operations discussed in Section MI2.1.3. Table MI3.13-1 provides details for the three ERP/AOC sites located in the planned construction areas and Figure MI3.13-1 shows the locations of the ERP sites and Figure MI3.13-2 shows the locations of the AOCs (127 WG 2016).

The 127 WG maintains a Selfridge ANGB Installation Restoration Program Site Summary Table with updated ERP/AOC site status and LUC requirements. An Annual Certificate of Compliance, including the Selfridge ANGB Installation Restoration Program Site Summary Table, is submitted to EGLE every year. The Spill Prevention, Control, and Countermeasures Plan contains the status of all USTs, OWSs, and ASTs on the installation. All LUCs outlined in the NFA documents are incorporated into the Selfridge ANGB Installation Restoration Program Site Summary Table. ANG and/or DoD control access to ERP/AOC sites to prevent unacceptable exposure and maintain ERP/AOC sites in a condition that is protective of public health, safety, welfare, and environment (127 WG 2008). Depending on the ERP/AOC site characteristics, the following LUCs may be present:

• <u>Restrictions on disturbance of soil/groundwater</u>: ANG uses the most current internal standard operating procedures that have been reviewed and approved by the EGLE to address potential exposures associated with construction or disturbance of the soils/groundwater.

ERP Site	Materials of Concern	Status
7: East Ramp Spill Site (SS007)	ERP Site 7 is the East Ramp located on the southeast portion of the installation. The ramp has been in use from 1922 to present for aircraft parking, maintenance, and fueling. Approximately 6,000 gallons of Jet Propulsion Fuel No. 4 was spilled prior to 1983. Methylene chloride, trichloroethylene, and 1,1,2-trichloroethane were found in the soil at concentrations exceeding the EGLE Part 201 criteria. Due to the depth of soil contamination, 7.5 to 25 feet bgs, tight clay matrix, and concrete cap over the site, a NFA determination was granted with concurrence from EGLE in 2003. Soil and groundwater LUCs are in place at the site.	NFA 2003, LUCs
21: Hazardous Waste Storage at Building 120 (SS021)	This site consists of a 2,100-SF hazardous waste storage area located on a grassy area adjacent to the northwest corner of Building 120, where 55-gallon drums of waste solvents, paints, oils, hydraulic oils, and degreasers were stored. The estimated amount of spills from routinely pouring waste into drums is 25 to 75 gallons per year. This practice continued from the 1940s until 1989. A Feasibility Study was conducted in 2005 that recommended remedial actions for soil (excavation) and groundwater (in-situ chemical oxidation with long-term monitoring). EGLE concurred with a NFA Approval in 2010 with long-term monitoring of groundwater.	NFA, Long-Term Monitoring of Groundwater
AOC Site	Materials of Concern	Status
East Ramp Fuel Line (TU051)	The AOC TU051site is a former 8-inch buried jet fuel pipeline running approximately 2,300 linear feet under the East Ramp. The fuel line was abandoned in the mid-1990s; however, residual fuel within the line was not evacuated. In 2006, a break in the fuel line resulted in a release. Installation personnel recovered 600 gallons of fuel and removed 3 cubic yards of impacted soil. Restoration activities included removal of an additional 100 cubic yards of soil, backfill compaction, replacement of asphalt over the fill material to grade and curb replacement. NFA was recommended in 2011 with concurrence from EGLE. LUCs are in place at the site.	NFA 2011, LUCs
PRL Site	Materials of Concern	Status
Building 154 – Fuel System Repair (PRL 4)	PRL 4 (Building 154) was constructed in 1991 and used as a maintenance facility for aircraft fuel systems. The building was equipped with an AFFF Fire Suppression System. AFFF is stored in a 300-gallon AST and in 55-gallon drums.	Expanded SI or RI recommended
East Ramp (PRL 15)	PRL 15 (East Ramp) is a concrete apron used for aircraft parking and minor maintenance activities. No release of AFFF was noted on the East Ramp; however, releases from adjacent Buildings 33 and 154 may have impacted the East Ramp.	Expanded SI or RI recommended

Table MI3.13-1. ERP/AOC/PRL Sites within the 127 WG Installation

Legend: AFFF = Aqueous Film Forming Foam; AOC = Area of Concern; EGLE = Michigan Department of Environment, Great Lakes, and Energy; ERP = Environmental Restoration Program; NFA = No Further Action; PRL = Potential Release Location; RI = Remedial Investigation; SF = square foot/feet; SI = Site Investigation.





- <u>Restrictions on soil relocation</u>: ANG complies with Section 20120c of Part 201, Environmental Remediation of the Natural Resources and Environmental Protection Act, 1994 Public Act 451, as amended (Act 451), and other applicable state or federal regulations if any soil would be relocated. Specific contaminants must be evaluated using the most current applicable Part 201 Cleanup Criteria prior to any construction activity, soil relocation, or change in land use. Base policy and guidelines require the coordination of impacted soils with the Environmental Management Office and EGLE, as required.
- <u>Restrictions on groundwater withdrawal</u>: Construction and use of groundwater wells and crock wells are prohibited.
- <u>Land Transfer Notification</u>: ANG or DoD must provide the EGLE with notification of any pending real estate transactions that would affect this AOC. ANG or DoD must fully and finally comply with all applicable state and federal cleanup requirements at the time of a transfer of property or ANG installation closure. NFA must be included in the site-wide remedial action plan or completion document that is required by state or federal regulations at the time of a transfer of property or ANG installation closure.

A Site Investigation for Per- and Polyfluoroalkyl Substances was performed at the 127 WG in 2018 (NGB 2018b). Twenty-five potential release locations (PRLs) were investigated based on a Preliminary Assessment conducted in 2016 (127 WG 2016). EGLE requested an additional three PRLs be included in a future Site Investigation. All 28 PRLs were recommended for an expanded Site Investigation to further delineate the extent of contamination or for a Remedial Investigation. Of the 28 PRLs, 2 PRLs including Building 154 – Fuel System Repair (PRL 4) and East Ramp (PRL 15) are located in areas of planned construction. Table MI3.13-1 provides details for the two PRLs located in the planned construction. The highest concentrations of PFOS/PFOA in any single sample found during the Site Investigation in the two PRLs within the planned areas of construction area presented in Table MI3.13-2.

 Table MI3.13-2. PFOS/PFOA Potential Release Locations that Intersect Proposed Construction

Building	Max. Soil (PFOS/PFOA) mg/kg	Max. Groundwater (PFOS/PFOA) μg/l
Building 154 (PRL 4)	0.30 / 0.0022	0.062 U* / 0.054 U*
East Ramp (PRL 15)	0.0130 / 0.0017	0.058 J+ / 0.022 J+

Notes: $1 \mu g/l = 1$ part per billion = 1,000 parts per trillion.

J = estimated concentration.

J+= Reported value may not be accurate or precise, but the result may be biased high.

U* = Reported value changed to non-detect at elevated quantitation limit due to a blank detection.

Legend: µg/l = microgram per liter; mg/kg = milligram per kilogram; PFOA = Perfluorooctanoic Acid; PFOS = Perfluorooctane Sulfonate; PRL = Potential Release Location.

MI3.13.1.2 Environmental Consequences

Proposed Action

Hazardous Materials

Training activities and other functions related to the current A-10 program would be expected to remain similar for the F-35A beddown. With computerized self-tests for all systems, the F-35As are expected to reduce maintenance time and cost as well as reducing the need for maintenance since the F-35As are newer aircraft. This reduction in maintenance activities associated with the F-35As would result in a slight reduction of the amount of hazardous waste generated. The major differences would be the omission of cadmium fasteners, chrome plating, copper-beryllium bushings, and the use of a non-chromium primer instead of primers containing cadmium and hexavalent chromium currently used for fighter aircraft.

Under this alternative, the total annual number of F-35A operations would increase to 6,746 from 5,098 A-10 operations or 32 percent, which would represent an 8 percent increase in total aircraft operations at the airfield. The increase in airfield operations would increase the throughput of petroleum substances (e.g., fuels, oils) used during F-35A operations. In addition to the increased amount of fuel usage associated with aircraft operations, short-term increase of fuels used during construction activities (e.g., diesel, gasoline) expected to run earth-moving equipment and power tools and provide electricity and lighting. With the increase in airfield operations and increased fuel usage from construction there would be an increase in use of fuels under this alternative.

Biogenic methane is found across the 127 WG installation in the shallow soil sediment. An August 2018 deep well Methane Study indicated that biogenic methane is present in most permanent wells sampled and at all deep (50 feet) temporary wells. Several Proposed Action projects throughout the installation include subsurface construction. Methane is extremely flammable and presents an explosive hazard in enclosed spaces. Health and safety considerations should be evaluated before any intrusive subsurface work is initiated. The 127 WG would monitor for methane for any intrusive subsurface activities and mitigate all possible ignition sources (127 WG 2018).

Procedures for hazardous material management established for the 127 WG would continue to be followed in future operations associated with the Proposed Action and as required during all construction and renovation activities.

Toxic Substances

Under this alternative, 14 construction projects are proposed to accommodate the beddown of the F-35As, including interior modification at Buildings 18, 34, 117, 120, 140, 154, and Maintenance Hangar 3; new construction at Buildings 3, 18, 103, 171, Hangar 3, and on the airfield apron; and

planned demolition at Buildings 18 and 171. ACM is known to occur in Buildings 103 and 140. A LBP survey has not been conducted at the 127 WG. Any buildings built before 1978 may contain LBP and would be tested for LBP prior to demolition or renovation. All buildings included in the planned construction would be inspected for ACM and LBP according to established ANG procedures prior to any construction. All ACM would be properly removed and disposed of prior to construction in accordance with 40 CFR 61.40 through 157. LBP would be managed and disposed of in accordance with Toxic Substances Control Act, OSHA regulations, Michigan requirements, and established ANG procedures. Materials suspected to be contaminated with PCBs (especially discarded oil products, light fixtures, and transformers) would be screened for PCB contamination prior to disposal.

Hazardous Waste Management

The number of hazardous waste streams generated by F-35A operations would be expected to remain similar to those being generated by the existing A-10 aircraft. Additionally, the two aircraft require the same types of hazardous materials for their maintenance and operations (e.g., fuels, oils); although, the amount of maintenance and associated hazardous materials would be likely to decrease with the F-35As. Under this alternative, it is expected that there would be an 8 percent increase in the total number of aircraft operations at Selfridge ANGB; therefore, hazardous waste generation would be expected to increase commensurately. The increase in the hazardous waste would be fully supported by the current infrastructure at the base. Hazardous waste generation would continue to be managed in accordance with the base's Hazardous Waste Management Plan and all applicable federal, state, and local regulations. Additionally, no changes to the base's Large Quantity Generator status would be expected to occur due to the increase in hazardous waste generation from aircraft operations.

Environmental Restoration Program

In accordance with AFI 32-7020, *The Environmental Restoration Program*, construction, modifications, and/or additions to existing buildings can occur on or in proximity to existing ERP sites. Accordingly, the appropriate organizations (e.g., installation planners, ERP managers, design engineers) must consider a compatible land use based on current site conditions and the selected or projected remedial action alternatives. If the potential for uncharacterized ERP sites exist, the base would be responsible for identifying existing contamination at the proposed construction sites to avoid unknowingly locating construction projects in contaminated areas. The base would be responsible for performing necessary environmental baseline surveys, accomplishing EIAP requirements, and for otherwise being informed about existing site conditions and associated cost impacts in preparation for a construction project. When warranted by the site history, environmental restoration funds may be used to accomplish RCRA facility assessments, or preliminary assessments and site inspections undertaken in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, or similar site

investigations in accordance with applicable state laws for suspected releases. To the extent that a construction project generates actions to address contamination, or a need to change the timing of ERP-generated actions to address contamination, the costs of such actions are not Environmental Restoration Account-eligible and shall be funded as part of the construction project. This includes the handling, mitigation, and disposal or other disposition of contamination discovered before or during the construction activity.

The removal and disposal of unexpected contamination encountered within the construction project footprint would be undertaken as part of the construction project using project funds, which may include other military construction (MILCON) funds reprogrammed to a MILCON construction project. Construction contractor costs (such as direct delay costs and unabsorbed or extended overhead) incidental to discovery and removal of the contamination would be construction project funded to the extent that the government is responsible and liable for such costs.

Vapor intrusion should be evaluated when volatile chemicals are present in soil, soil gas, or groundwater that underlies existing structures or has the potential to underlie future buildings and there may be a complete human exposure pathway. Due to their physical properties, volatile chemicals can migrate through unsaturated soil and into the indoor air of buildings located near zones of subsurface contamination.

Three ERP/AOC sites (Site 7, Site 21, and TU051) (Figures MI3.13-3 and MI3.13-4) and two PFOS/PFOA PRLs (#4 and #15) (Figure MI3.13-4) overlap with the proposed construction under this alternative. ERP Site 7 has soil and groundwater media relocation restrictions from a June 20, 2003 closure letter and overlaps with planned renovation on the Aircraft Parking Apron. ERP Site 21 has soil and groundwater media relocation restrictions from a September 27, 2017 closure letter and is adjacent to the planned renovations at Buildings 00117 and 00120. Site TU051 has residual contamination from a fuel line spill and is adjacent to the planned renovation at Building 00140. PRL #4 overlaps the planned renovation at Building 00154 and PRL #15 overlaps the renovation on the Aircraft Parking Apron. PFOS/PFOA is present in the groundwater under both PRLs at concentrations in excess of the 70 parts per trillion (ppt) USEPA's Lifetime Health Advisory for drinking water. The 127 WG will comply with Air Force Guidance Memorandum (AFGM2019-32-01) *AFFF-Related Waste Management Guidance* to manage waste streams containing PFOS/PFOA (USAF 2019). The AFGM will be updated as needed to address changes in regulatory requirements, DoD determinations of risk, or development of new technologies.



Environmental Restoration Program Sites within the Vicinity of the Proposed Construction at Selfridge ANGB



Areas of Concern and Perfluorinated Compound Potential Release Location Sites within the Vicinity of the Proposed Construction at Selfridge ANGB Per the Site Investigation Report, no soil samples exceeded the risk-based screening level for PFOS/PFOA within the planned construction area. The combined PFOS/PFOA groundwater samples exceeded the Lifetime Health Advisory of 70 ppt for drinking water at both locations within the planned construction area. The next step in the CERCLA process is the Remedial Investigation. During the Remedial Investigation, the agency will collect detailed information to characterize site conditions, determine the nature and extent of the contamination, and evaluate risks to human health and the environment posed by the site conditions by conducting a baseline ecological and human health risk assessment. The CERCLA process will continue regardless of any construction activities. Construction activities, to include the handling, mitigation, and disposal or other disposition of contamination discovered before or during the construction activity, will proceed in accordance with all applicable legal requirements. Since contaminated media (e.g., soil, vapor, groundwater) is confirmed in the ERP/AOC sites with relocation restrictions and at the PRLs, construction project managers would coordinate with the 127 WG environmental manager to establish an appropriate course of action for the construction project to ensure that federal and state agency notification requirements are met, and to arrange for agency consultation, as necessary, if existing ERP sites are affected. As applicable, the 127 WG would coordinate with the EGLE regarding proposed construction near ERP/AOC sites on Selfridge ANGB.

If contaminated media (e.g., soil, vapor, groundwater) is encountered during the course of site preparation (e.g., clearing, grading) or site development (e.g., excavation for installation of building footers) for proposed construction activities, work would cease until the 127 WG environmental manager establishes an appropriate course of action for the construction project to ensure that any applicable federal and state agency notification requirements are met, and to arrange for agency consultation as necessary if existing ERP/AOC sites or PFOS/PFOA PRLs are affected.

No Action Alternative

Under the No Action Alternative, no F-35A operational aircraft would be based at Selfridge ANGB, no F-35A personnel changes or construction would be performed, and no training activities by F-35A operational aircraft would be conducted at the airfield. Under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft. Hazardous materials and waste would be expected to remain as described under affected environment in Section MI3.13.1.1. Therefore, there would be no significant impacts to hazardous materials and waste under the No Action Alternative.

MI3.13.2 Airspace

Impacts to airspace are not considered for this resource because the ROI for hazardous materials and wastes was considered to consist only of the installations themselves. The ROI does not include land beneath the SUA since no ground disturbance or construction would occur.

MI3.13.3 Summary of Impacts

Under the Proposed Action at Selfridge ANGB, there would not be an increased risk of hazardous waste releases or exposure. Any LBP or ACM that may be found in buildings that are proposed for construction activities would be managed per applicable USAF regulations, and the base's asbestos and LBP management plans. Three ERP/AOC sites (Site 7, Site 21, and TU051) and two PFOS/PFOA PRLs (#4 and #15) overlap with the proposed construction under this alternative. Since contaminated media (e.g., soil, vapor, groundwater) is confirmed in the ERP/AOC sites with relocation restrictions, construction project managers would coordinate with the 127 WG environmental manager to establish an appropriate course of action for the construction project to ensure that federal and state agency notification requirements are met, and to arrange for agency consultation, as necessary, if existing ERP sites are affected. As applicable, the 127 WG would coordinate with the EGLE regarding proposed construction near ERP/AOC sites on Selfridge ANGB. The 127 WG will comply with AFGM2019-32-01, *AFFF-Related Waste Management Guidance* to manage waste streams containing PFOS/PFOA (USAF 2019).

If contaminated media (e.g., soil, vapor, groundwater) is encountered during the course of site preparation (e.g., clearing, grading) or site development (e.g., excavation for installation of building footers) for proposed construction activities, work would cease until the 127 WG environmental manager establishes an appropriate course of action for the construction project to ensure that applicable federal and state agency notification requirements are met, and to arrange for agency consultation as necessary if existing ERP/AOC sites are affected. Impacts relative to hazardous materials and wastes would not be significant.

MI4.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

According to CEQ regulations, the cumulative effects analysis of an EIS 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 timeframe. The effects may then be incremental and may result in cumulative impacts. Actions overlapping with or in close proximity to the Proposed Action or alternatives 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 in the same timeframe tend to offer a higher potential for cumulative effects.

This EIS addresses cumulative impacts to assess the incremental contribution of the alternatives to impacts on affected resources from all factors. The ANG has made an effort to identify actions on or near the affected areas that are under consideration and in the planning stage at this time. These actions are included in the cumulative effects analysis, drawn from the level of detail that exists now. Although the level of detail available for those future actions varies, this approach provides the decision-maker with the most current information to evaluate the consequences of the Proposed Action Alternatives.

MI4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

In this section, an effort was made to identify past and present actions in the region and those reasonably foreseeable actions that are in the planning phase at this time. Actions that have a potential to interact with the Proposed Action at the 127 WG are included in this cumulative analysis. This approach enables decision-makers to have the most current information available so that they can evaluate the environmental consequences of the beddown of the F-35A aircraft at Selfridge ANGB and training in associated SUA.

Selfridge ANGB is an active military base that undergoes changes in mission and in training requirements in response to defense policies, current threats, and tactical and technological advances. The base, like any other major institution (e.g., university, industrial complex), requires new construction, facility improvements, infrastructure upgrades, maintenance, and repairs. In addition, tenant organizations may occupy portions of the installation, conduct aircraft operations, and maintain facilities. All of these actions (i.e., mission changes, facility improvements, and tenant use) will continue regardless of which alternative is selected.

The projects associated with the Proposed Action at Selfridge ANGB, were identified for their potential to have cumulative impacts on resources within the ROI and overlap in time; they are listed in Table MI4.1-1. Other ongoing maintenance and repair activities (e.g., repairing existing infrastructure and interior building renovations/alterations/modernizations) would not introduce any newly disturbed or impervious surfaces and are not included herein.

Year	Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Main Gate/Entry Control			
2025	Construction of new gate and rerouting of perimeter roads.	385,200	287,600
Campground		1	
2019 (road)/2025 (other)	The land east of the main gate would be either leased or transferred to Macomb County to become a state campground. This project includes a new access road to the campground.	281,000	210,600
Department of Homeland Security			
2019	North of the new campground area is a small parcel that would be leased to the Department of Homeland Security and B903 would be renovated.	0	0
Southern Road and Base Boundary			
2024	The installation perimeter fence would be rerouted to exclude the golf course and the road from the south gate would be rerouted to go around the northern side of the golf course.	437,991	396,378
Solar PV Array Farm			
2020	Construction of a 10-megawatt solar photovoltaic array farm on a 64-acre area. B972 and associated parking would be demolished and returned to pervious surfaces. In addition, 11,000 SF of Fish Pond Road that goes through the property would be demolished.	205,721	-134,597
Salt Barn			1
2021	A new 2,922 SF salt barn would be constructed. B823, the existing salt barn, may be demolished or may continue to be used in its current capacity.	3,722	2,922
Shoreline Protection Perimeter Fencing			
2024	New fencing would be added to the northern portion of the shoreline.	18,500	18,500
Fuel Cell/Corrosion Control			
2021	1,300 SF addition to the northeast side of B154 for locker rooms and bathrooms.	4,500	2,300

Table MI4.1-1. Current and Reasonably Foreseeable Actions(Page 1 of 2)

Year	Action	Total Area of New Ground Disturbance (SF)	New Impervious Surface (SF)
Addition to Hangar 3			
2020	4,000 SF addition to the west side of Hangar 3 for AGE and maintenance. B45 would be demolished and returned to pervious surfaces.	18,500	-13,500
Various Internal and			
External Renovations			
and Demolitions			
2020-2023	Internal and/or external renovations would be completed for B140, B120, B117, B126, Hangars 36, 3, and 5. In addition, roofs and HVAC would be replaced basewide. B46 would be demolished.	5,400	0
Various Pavement			
Repairs			
2019-2023	Repairs to the following pavements would occur: perimeter road, secondary roads, parking lots basewide, munitions area, east and west ramps, taxiway bravo, runway keep, and hazardous cargo pad.	1,801,600	54,500
Utility Repairs			
2021-2023	Repairs to the basewide sanitary sewer system, water mains, and airfield storm drainage would occur.	0	0

Table MI4.1-1. Current and Reasonably Foreseeable Actions (Page 2 of 2)

Legend: AGE = Aerospace Ground Equipment; EA = Environmental Assessment; HVAC = heating, ventilation, and air conditioning; SF = square foot/feet.

In addition to construction projects on the installation, projects listed in Table MI4.1-2 could interact with beddown of the F-35A at Selfridge ANGB.

Table MI4.1-2. Past, Present, and Reasonably Foreseeable Actions(Page 1 of 2)

Proponent	Project Name	Anticipated Year for Implementation
USAF	They are currently trying to double the number of "Northern Strike" exercises to two per year vice one.	NA
ANG	An EA is currently being conducted in support of the 2015 plan by the Director of the ANG to transform Alpena Training Center into the ANG's premier Close Air Support Center of Excellence. The plan includes creation of new airspace and modifications to the existing Alpena SUA Complex (Grayling West, Grayling East, Grayling East Low MOAs, Pike Low MOA, Steelhead Low MOA, R-4201B) as needed to support the training requirements of fifth-generation fighters such as the F-22 and F-35A, meet current and emerging training needs, and maximize efficient use of the airspace structure. Under the plan, new airspace would be used to expand existing MOAs and Restricted Areas, and existing MOAs would be realigned and/or floors lowered as needed to create new MOAs. Utilization is not expected to change from the affected environment.	NA

Proponent	Project Name	Anticipated Year for Implementation
Marine Forces	Internal renovation of Buildings 1430 and 1435 on Selfridge	2021
Reserve	ANGB and paving an existing equipment parking lot.	2021
Chesterfield	Construction of remaining shopping complex northeast of	NA
Town Center	Interstate 94.	1111
Developer	30-acre parcel south of the base that is planned for a single-family	NΔ
Developer	development of approximately 60 homes within the next 5 years.	1174
Developer	Multi-family single-story development of 50-70 units planned	NΔ
Developer	north of the base within the next 5 years.	1474
	Three Readiness and Environmental Protection Integration	
Selfridge ANGB	projects are being evaluated for purchase for conservation	
	easements to avoid incompatible development. These include two	NA
	areas north of the installation and one area south of the	
	installation.	

Table MI4.1-2. Past, Present, and Reasonably Foreseeable Actions(Page 2 of 2)

Legend: ANG = Air National Guard; EA = Environmental Assessment; MOA = Military Operations Area; R- = Restricted Area; SUA = Special Use Airspace; USAF = United States Air Force.

MI4.2 ANALYSIS OF CUMULATIVE EFFECTS

The following analysis considers how the impacts of these other actions might affect or be affected by those resulting from the Proposed Action at the Selfridge ANGB and whether such a relationship would result in potentially additive impacts not identified when the Proposed Action is considered alone. Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources, quantifiable data are not available and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made based on an understanding of the nature of the project regarding cumulative impacts related to this EIS.

Past implementation of force structure changes at the 127 WG are integrated into the affected environment and analyzed under the No Action Alternative. Additionally, all aircraft operations are incorporated and analyzed in the relevant resource categories for the proposed F-35A beddown.

MI4.2.1 Noise

Base. Under the Proposed Action at the 127 WG installation, 1,073 additional acres would be exposed to noise levels equal to or greater than 65 dB DNL, which would be a significant impact. The addition of those projects listed in Table MI4.1-1 and in the list of non-installation-related projects would not be expected to substantially add to the noise impacts; however, given that impacts from the Proposed Action would be significant, cumulative impacts would be similarly significant. All of the non-installation projects are short-term construction projects and would occur in the airport environ or in areas identified as industrial. Noise associated with the construction projects would not affect sensitive receptors, disturb sleep, interrupt speech, or cause

classroom disruptions in the long term. Noise from implementation of these actions would be short-term and localized, and would not be expected to increase the overall DNL noise contours. Refer to Section MI4.2.5 for discussion of land use compatibilities.

Airspace. Noise generated in the reconfigured and new airspace in the Alpena SUA Complex should not appreciably change the noise environment underlying the airspace when considered along with the F-35A beddown. There would be no changes in the No Action Alternative number of flights operating in the airspace, other than the addition of F-35A aircraft and subtraction of A-10A aircraft. Fighter jet-generated noise would continue to dominate sound levels in the training airspace. Cumulative impacts would not be significant when considered with the Proposed Action at the Selfridge ANGB.

MI4.2.2 Airspace

At the installation, airfield airspace operations would not be impacted by any reasonably foreseeable actions; therefore, there would be no significant impacts when considered along with the F-35A beddown. Cumulatively, Alpena SUA would be reconfigured and new airspace added. However, it is not anticipated that this action, along with the F-35A beddown, would add to cumulative impacts. Military aircraft would continue to operate under existing flight rules designed to separate aircraft activities. ANG and FAA positive control and management would continue to guide operations within the airspace.

MI4.2.3 Air Quality

Based on the ACAM calculations, the criteria pollutant emissions associated with the ANG construction activities described in Table MI4.1-1 would not exceed the *de minimis* thresholds for VOCs, NO_x, SO₂, and PM_{2.5}. Because the emission results do not exceed the thresholds, the General Conformity Applicability Analysis for these ANG construction projects is complete and the construction activities as described are exempt from the General Conformity Regulations, as indicated in the *Environmental Assessment for Construction and Demolition Projects at the 127th Wing Installation, Selfridge Air National Guard Base, Michigan* (NGB 2019). Of the remaining criteria pollutant/precursor emissions (CO and PM₁₀) associated with these ANG projects, PM₁₀ is estimated above the comparative indicator value, primarily as a result of estimating the emissions from multi-year paving projects in a single year. Specific actions to reduce PM₁₀ emissions would be implemented, such as surface wetting when grading and excavating to mitigate PM emissions. Based on the information on these projects, and in combination with the decrease in criteria pollutant and precursor emissions, with the exception of NO_x and SO_x, which would slightly increase, it is unlikely that cumulative significant impacts to air quality from all of the projects that are listed in Table MI4.1-1, such as impedance of progress to achieve attainment for ozone, CO,

and PM_{2.5}, would result. It is more likely that the overall level of criteria pollutant emissions would increase, but at a level that would generate few, if any, impacts.

GHG emissions would modestly increase due to implementing the F-35A beddown, as identified in MI3.3.1.2. All of the projects listed in Table MI4.1-1 and in the bulleted text would generate GHGs. For the projects involving construction, which is of temporary duration, some long-term benefits may offset the GHGs emitted during construction (for example, energy-efficient buildings or providing residents of new developments shorter commutes). While quantification of GHG emissions for all of these projects is not possible, it can generally be assumed that an overall small increase in GHG emissions, compared to the current levels, would occur, primarily as a result of the beddown and the additional annual exercise, both of which would be ongoing activities compared to construction projects that have limited timeframes.

Climate change, by definition, is a cumulative impact that results from the incremental addition of GHG emissions from millions of individual sources that collectively have a large impact on a global scale. Impacts of climate change on the region will include severe rain events and flooding, which could have increasingly negative impacts on mission activities and installation infrastructure. Higher temperatures increase the formation of ground level ozone, which is already in excess of air quality standards in the area, making it more difficult to achieve compliance with the NAAQS.

MI4.2.4 Safety

Risk of a catastrophic event occurring during construction activities under this alternative or those activities described in Table MI4.1-1 is considered low, and strict adherence to all applicable occupational safety requirements further minimize the relatively low risk associated with described construction activities. Providing new and renovated facilities for the 127 WG that support operational requirements of the F-35A, and are properly sited with adequate space and a modernized supporting infrastructure would generally enhance ground and flight safety during required operations, training, maintenance and support procedures, security functions, and other activities conducted by the 127 WG. Proposed renovation and infrastructure improvement projects listed in Table MI4.1-1 would not impact aircraft take-offs and landings or penetrate any APZs. New building construction is not proposed within APZs. Therefore, proposed renovation and infrastructure improvement projects would not impact aircraft take-offs and landings or penetrate any APZs. New building construction is not proposed within APZs, though the existing residential area within the southern CZ would continue to be a significant issue that requires management. Therefore, construction activity described in Table MI4.1-1 would not result in any greater safety risk or obstructions to navigation. While there are some planned construction projects within the proposed QD arcs, per Air Force Manual 91-201, Explosive Safety Standards, all PTRDs and IBDs meet specified NEWQD criteria. No explosives would be handled during construction or
demolition activities. Therefore, no additional risk would be expected as a result of implementation of this alternative. AT/FP have also been addressed in all facility construction projects. The fire and crash response capability currently provided by the 127 WG is sufficient to meet all requirements. Cumulative impacts to ground or flight safety would be negligible at the airfield. Within the SUA, ANG and FAA positive control and management would continue to ensure safe operations within the airspace. The existing number of operations would increase, however, the magnitude of impacts to airspace safety would be minimal as those described in Section MI3.4.2.2. In summary, impacts to airfield and safety risks by implementation of the Proposed Action at the Selfridge ANGB would not be significant when considered with past, present, and reasonably foreseeable future actions.

MI4.2.5 Land Use

As mentioned in Section MI4.2.1, construction projects outside of base boundaries would introduce short-term noise increases during construction; however, these would not generate noise levels to cumulatively affect or change land use compatibilities. The noise contours greater than 65 dB DNL associated with the Proposed Action at Selfridge ANGB would increase by 1,073 acres off-base property. Comparison of the Proposed Action Alternative contours with the No Action Alternative contours shows potential change in noise conditions and land use compatibility (see Table MI3.5-2 and Figure MI3.1-2). Given that impacts to land use from the Proposed Action would be significant, cumulative impacts would similarly be considered significant.

MI4.2.6 Socioeconomics

Economic activity associated with proposed construction activities described as a component of this alternative and those shown in Table MI4.1-1, such as employment and materials purchasing, would provide short-term economic benefits to the local economy. Additionally, there would be a permanent increase in up to 85 personnel positions. However, short-term cumulative beneficial impacts resulting from construction payrolls and materials purchased as a result of implementation of the Proposed Action at Selfridge ANGB and those projects listed in Table MI4.1-1 would not be significant on a regional scale.

MI4.2.7 Environmental Justice and the Protection of Children

While noise levels would rise relative to the affected environment for some residents of lowincome and minority areas, there would be no associated health or environmental risk in these areas and there would be no significant disproportionate impacts to low-income or minority populations. No other projects listed in Table MI4.1-1 would be expected to impact environmental justice communities or children. Therefore, no cumulative impacts to the health or safety of environmental justice populations under the Proposed Action at Selfridge ANGB. However, under the Proposed Action, some schools would be affected by increased noise levels, with associated adverse impacts of interrupted speech and hindrance of learning and several block groups that would be exposed to noise levels of between 65 and 75 dB DNL have greater proportions of children than the surrounding areas. This would lead to significant disproportionate impacts to children. Given that impacts to children from the Proposed Action would be significant, cumulative impacts would similarly be considered significant.

MI4.2.8 Infrastructure

For purposes of this analysis infrastructure includes potable, waste, and stormwater; electrical and natural gas systems; solid waste management; and transportation. Under the Proposed Action at Selfridge ANGB, short- and long-term demand for all services would increase by a minor degree when considered regionally. The Proposed Action Alternative and other projects would increase demand for potable water, increase production of wastewater, and create more impervious surfaces to increase stormwater runoff. However, cumulative effects are anticipated to be minimal because there is current and long-term capacity to meet increased demand for drinking water and disposal of wastewater. For stormwater, BMPs such as silt fencing, vegetation management, and ditching would minimize erosion and sedimentation during the short-term construction phases; retention and detention pond systems would avoid excessive runoff due to increases in impervious surfaces in the long term.

Demand for electricity and natural gas would be expected to increase in the short-term due to construction activities and in the long term due to increases in personnel. In the short-term, existing energy systems have the ability to meet increased demand. In the long term, there is capacity to meet the demands of the minor increase in personnel at the base and population associated with new homes in the region. It is assumed that any new federal projects would incorporate Leadership in Energy and Environmental Design and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation when compared to facilities currently in place.

Under the Proposed Action at Selfridge ANGB, it is anticipated that there would be both shortand long-term increases in solid waste generation. During demolition and construction phases, all materials would be disposed of in permitted facilities, which have the capacity to accept these materials. In the long term, solid waste generated by the regionally minor increase in personnel associated with military actions and those with new home and business construction could be handled by existing solid waste management systems.

In terms of transportation, the local traffic network has the ability to meet the short-term increases in traffic during construction activities. In the long term, the transportation network would be able to meet the needs of the minor increase in personnel. In summary, cumulative impacts to infrastructure due to the Proposed Action at Selfridge ANGB and reasonably foreseeable future projects would not be significant.

MI4.2.9 Earth Resources

Total acreage disturbed by the F-35A beddown would be approximately 104,000 SF (2.4 acres), including up to 59,400 SF (1.4 acre) of this total that would be converted to impervious surfaces such as roofs and paved areas. New construction associated with the projects listed in Table MI4.1-1 would result in up to 3,203,134 SF (73.5 acres) of new construction footprint; approximately 59 percent of this is due to pavement repair across the installation. In addition, there would be up to 841,403 SF (19.3 acres) of new impervious surfaces. All proposed construction is within the footprint of the developed base and would not require any regrading or movement of large amounts of earth. However, it is anticipated that the larger developments of the shopping center and housing divisions would require regrading and movement of large amounts of earth. In terms of cumulative earth resources impacts, the larger, off-base development projects would affect topography, but are unlikely to impact geology. The Proposed Action at Selfridge ANGB itself would cause negligible additive cumulative impacts, in relation to these much larger development projects.

The CWA considers stormwater from a construction site as a point source of pollution regulated by the NPDES permit. Therefore, those projects described in Table MI4.1-1 larger than 1 acre are required to have a site-specific and detailed SWPPP that coordinates the timing of soil disturbing activities with the installation of soil erosion and runoff controls in an effort to reduce the impacts to the local watershed. This is an effective way of controlling erosion while soil is exposed and subject to construction activity. Implementation of standard construction practices would be used to limit or eliminate soil movement, stabilize erosion, and control sedimentation. These standard construction practices would include the use of: velocity dissipation devices; well-maintained silt fences; minimizing surficial area disturbed; stabilization of cut/fill slopes; minimization of earthmoving activities during wet weather; and use of temporary detention ponds. Following construction, disturbed areas not covered with impervious surfaces would be reestablished with appropriate vegetation and managed to minimize future erosion potential. Given the use of engineering practices that would minimize potential erosion, cumulative impacts to earth resources would be expected to be negligible under the Proposed Action at Selfridge ANGB.

The Farmland Protection Policy Act is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. However, none of the projects (neither the Proposed Action Alternative nor the present/reasonably foreseeable projects) are proposed on lands subject to the Farmland Protection Policy Act. In summary, implementing the Proposed Action at Selfridge ANGB, along with other anticipated projects, would not result in significant cumulative impacts to earth resources.

MI4.2.10 Water Resources

Surface Water. Those projects that exceed 1 acre in size under the Proposed Action at Selfridge ANGB or other projects, would require coverage under Michigan's Construction General Permit. In compliance with coverage under this permit, a Construction BMP Plan (CBMPP) would be implemented and prepared to maintain effective erosion and sediment controls. The CBMPP includes the erosion, sediment, and pollution controls used, identifies periodic compliance inspections, and prescribes maintenance measures for the controls identified, throughout the life of the construction projects. Through compliance with Michigan's Construction General Permit, cumulative effects would not be significant when considering the Proposed Action at the base and other projects.

Groundwater. Construction and demolition impacts to groundwater under the Proposed Action at Selfridge ANGB, when considered with present and reasonably foreseeable projects, would not extend below ground surface to a depth that would affect the underlying aquifer. Although fuel or other chemicals could be spilled during construction, demolition, and renovation activities, implementation of the required Spill Prevention, Control, and Countermeasures Plan and immediate cleanup of any spills would prevent any infiltration into groundwater resources. Therefore, cumulative impacts to groundwater resources would not be significant under the Proposed Action at Selfridge ANGB.

Stormwater. Construction and demolition activities associated with the Proposed Action Alternative, when considered with present and reasonably foreseeable projects, could result in a temporary, cumulative increase in surface water turbidity; however, BMPs associated with the SWPPP are designed to minimize these impacts. These BMPs include practices such as wetting of soils and silt fence installation, as well as adherence to federal and state erosion and stormwater management practices, to contain soil and runoff on the construction project areas. All other present and foreseeable projects would be required to follow the same state and federal guidelines for construction permitting to ensure water quality was protected from possible erosion and sedimentation. This includes implementing project-specific BMPs to minimize impacts to water quality and using stormwater engineering controls (e.g., stormwater runoff control systems directing water off the developed areas) to decrease future impacts to water quality following construction. The use of spill prevention plans and SWPPPs during construction would minimize impacts to water quality.

Additionally, in accordance with UFC 3-210-10, *Low Impact Development* (as amended, 2016) and EISA Section 438, any temporary increase in surface water runoff as a result of the proposed construction is required to be attenuated through the use of temporary and/or permanent drainage management features. Under these requirements, federal facility projects with over 5,000 SF of new impervious surface must maintain or restore, to the maximum extent technically feasible, the

predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. This would apply to several of the construction projects proposed under this Proposed Action Alternative and as such would minimize impacts to stormwater runoff. Cumulative impacts to stormwater would not be significant.

Floodplains. Several of the Proposed Action Alternative projects and some of the projects that are reasonably foreseeable outside of the base boundaries, would occur within the 100-year floodplain. This would result in cumulative impacts to the floodplain. Where the only practicable alternative is to site in a floodplain, a planning process is followed to ensure compliance with EO 11988. For federal facility construction, as discussed under surface water, predevelopment hydrology would be maintained through compliance with LID and EISA and there would no substantial increase in stormwater runoff. Cumulatively, there is a potential to impact floodplains when the Proposed Action at Selfridge ANGB is considered along with present and reasonably foreseeable projects.

Wetlands. None of the construction activities are associated with wetlands. Therefore, cumulative impacts to wetlands would not be significant when the Proposed Action at the 127 WG installation is considered along with present and reasonably foreseeable projects.

MI4.2.11 Biological Resources

Noise levels would be expected to increase from current levels with the conversion to the F-35A aircraft. However, these noise levels from operations and construction are not expected to impact wildlife in the area because they are likely accustomed to elevated noise levels associated with current commercial aircraft and military operations. However, bald eagles protected under the Bald and Golden Eagle Protection Act have been observed at the installation. Three non-federally listed, state protected threatened or endangered species (the common loon, peregrine falcon, and short-eared owl) do occur on the installation. Species protected under the Migratory Bird Treaty Act; the Bald and Golden Eagle Protection Act; and Part 365 of the Natural Resources and Environmental Protection Act, Act 451 of 1994 that have been observed or may potentially occur at the 127 WG installation are already exposed to airfield noise and would generally not be affected by a moderate increase in ambient noise levels, as they are likely accustomed to elevated noise levels associated with current aircraft and military operations. The opportunity for bird aircraft strikes to occur, including those with migratory birds, would remain the same as current levels. No threatened and endangered or special status species are currently known to reside on Selfridge ANGB or within the land area under the projected noise contours. Construction-related impacts to the vegetation at the base and in the vicinity of projects identified in Table MI4.1-1 would be minor due to the lack of sensitive vegetation in the project areas. In general, construction activities at the Selfridge ANGB would primarily occur on sites that are already highly altered. These impacts would include the removal of some vegetation and associated wildlife habitat. However,

wildlife that uses these areas is typical of urban and suburban areas. No impacts to any federally or state threatened, endangered, or special status species is expected as a result of the Proposed Action at Selfridge ANGB; therefore, cumulative impacts to biological resources would not be significant.

MI4.2.12 Cultural Resources

The areas of proposed construction are considered to have no to low probability of containing archaeological resources. In the event of an inadvertent discovery during ground-disturbing operations, work would cease immediately, the area would be secured, and the environmental manager would be contacted. The environmental manager would follow ANG Inadvertent Discovery protocol. Several of the facilities listed for renovation and/or modification under the Proposed Action at Selfridge ANGB are either listed or eligible for listing in the NRHP. However, under the programmatic agreement and through consultation with the SHPO, impacts to architectural features are expected to be negligible. No traditional cultural resources have been identified on the base or in areas proposed for present and future development. Therefore, cumulative impacts to cultural resources would not be significant under the Proposed Action at Selfridge ANGB.

MI4.2.13 Hazardous Materials and Wastes, and Other Contaminants

The types of hazardous materials needed for maintenance and operation of the F-35A would be expected to remain similar to those currently used for maintenance and operation of the A-10 fleet. Under this alternative, the total number of airfield operations would increase approximately 8 percent; therefore, throughput of petroleum substances and hazardous waste streams would be expected to increase. Additionally, it is expected that short-term increases in the quantity of fuel used during construction activities for this action and the present/reasonably foreseeable project would occur. Hazardous waste generation (e.g., used oil, used filters, oily rags, etc.) would continue to be managed in accordance with the base's Hazardous Waste Management Plan and all applicable federal, state, and local regulations. The pollution prevention detailed in the Hazardous Waste Management Plan would be continued and would include any construction-related materials or wastes associated with aircraft operations. Additionally, no changes to the base's Large Quantity Generator status would be expected to occur due to the no net change in hazardous waste generation from aircraft operations. Any structures proposed for demolition, addition, or retrofit would be inspected for ACM and LBP according to established procedures prior to any renovation or demolition activities. Cumulative impacts as a result of the Proposed Action at Selfridge ANGB and present/reasonably foreseeable projects would not be significant.

MI4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA CEQ regulations require environmental analyses under an EIS to identify "...any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented" (40 CFR Section 1502.16). Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Building construction material such as gravel and gasoline usage for construction equipment would constitute the consumption of nonrenewable resources. Irretrievable resource commitments also involve the loss in value of an affected resource that cannot be restored as a result of the action.

Training operations would involve consumption of nonrenewable resources, such as gasoline used in vehicles and jet fuel used in aircraft. Use of training ordnance would involve commitment of chemicals and other materials. None of these activities would be expected to substantially affect environmental resources, because the relative consumption of these materials is expected to change negligibly.

The primary irretrievable impacts of implementation of the Proposed Action at Selfridge ANGB or for any of the alternatives would involve the use of energy, labor, materials and funds, and the conversion of some lands from an undeveloped condition through the construction of buildings and facilities on the installation. Irretrievable impacts would occur as a result of construction, facility operation, and maintenance activities. Direct losses of biological productivity and the use of natural resources from these impacts would be inconsequential.

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