Final

Environmental Impact Statement

for T-7A Recapitalization at
Joint Base San Antonio, Texas

February
2022

Privacy Advisory

The Final Environmental Impact Statement (EIS) is provided in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (Title 40 Code of Federal Regulations §§ 1500–1508), and 32 Code of Federal Regulations § 989, *Environmental Impact Analysis Process*.[1] The Environmental Impact Analysis Process provides an opportunity for public input on Department of the Air Force (DAF) decision making, allows the public to offer inputs on alternative ways for DAF to accomplish what it is proposing, and solicits comments on DAF's analysis of environmental effects.

Public commenting received on the Draft EIS allowed DAF to make better-informed decisions. Letters or other written or oral comments provided have been addressed in the Final EIS. Providing personal information is voluntary. Private addresses were compiled to develop a mailing list for those requesting copies of the EIS. However, only the names of the individuals making comments and specific comments will be disclosed. Personal information, home addresses, telephone numbers, and email addresses are not published in the Final EIS.

This document is compliant with Section 508 of the Rehabilitation Act. This allows assistive technology to be used to obtain the available information from the document. Due to the nature of graphics, figures, tables, and images occurring in the document, accessibility is limited to a descriptive title for each item.

[1] This EIS was ongoing prior to the September 14, 2020, effective date of the CEQ's final rule updating its regulations for implementing the procedural provisions of NEPA. Accordingly, the revised CEQ regulations were not used for this action pursuant to 40 CFR § 1506.13.

Cover Photo Credit: Boeing T-7A Red Hawk Website, March 2020
https://www.boeing.com/defense/t-7a/#/gallery

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AAF	Auxiliary Airfield
ACAM	Air Conformity Applicability Model
ACM	asbestos-containing material
ACP	access control point
AETC	Air Education and Training Command
AFB	Air Force Base
AFFF	aqueous film-forming foam
AFH	Air Force Handbook
AFI	Air Force Instruction
AGL	above ground level
AICUZ	Air Installations Compatible Use Zones
ANSI	American National Standards Institute
APE	area of potential effect
APZ	accident potential zone
BASH	Bird/Wildlife Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CCMA	Cibolo Creek Municipal Authority
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalents
CWA	Clean Water Act
CZ	clear zone
DAF	Department of the Air Force
dB	decibel
dBA	A-weighted decibel
DNL	day-night average sound level
DoD	Department of Defense
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
ERC	Emission Reduction Credit
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FM	Farm to Market Road
FR	Federal Regulation
FSRM	facilities sustainment, restoration, and modernization
ft^2	square feet
FTS	Flying Training Squadron
GBTS	Ground Based Training System
GCR	General Conformity Rule
GHG	greenhouse gas
gpd	gallons per day
HDR	HDR, Inc.
I-	Interstate
IDP	Installation Development Plan
IFF	Introduction to Fighter Fundamentals
IPaC	Information for Planning and Consultation
JBSA	Joint Base San Antonio
JLUS	Joint Land Use Study
LBP	lead-based paint
L_{eq}	equivalent sound level
L_{max}	maximum sound level
LOS	level of service
MBTA	Migratory Bird Treaty Act
MILCON	military construction
MMRP	Military Munitions Response Program
MOA	Military Operating Area
MOU	Memorandum of Understanding
MSL	mean sea level

MTR	Military Training Route
MTS	Maintenance Training System
MW	megawatts
MWh	megawatt hours
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHLD	National Historic Landmark District
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Administration
P2	pollution prevention
Pb	lead
PCB	polychlorinated biphenyl
PCI	Pavement Condition Index
pCi/L	picocuries per liter
PFAS	polyfluoroalkyl substances
PHL	Potential for Hearing Loss
PIT	Pilot Instructor Training
PM_{10}	particulate matter less than or equal to 10 microns
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	prevention of significant deterioration
Q-D	quantity-distance
RCRA	Resource Conservation and Recovery Act
RCUP	Regional Compatible Use Plan
REPI	Readiness and Environmental Protection Integration
ROD	Record of Decision
ROI	region of influence
RONA	record of non-applicability
SCC	Social Cost of Carbon
SEL	sound exposure level
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	oxides of sulfur
SPCC	spill prevention, control and countermeasure
SUA	Special Use Airspace
SWPPP	Stormwater Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
U.S.	United States
UFC	United Facilities Criteria
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds

Cover Sheet

Environmental Impact Statement for T-7A Recapitalization at Joint Base San Antonio, Texas

Responsible Agencies: United States Department of the Air Force (DAF); Air Education and Training Command.

Affected Locations: Joint Base San Antonio-(JBSA) Randolph and JBSA-Lackland in Bexar County and Seguin Auxiliary Airfield (AAF) in Guadalupe County, Texas.

Report Designation: Final Environmental Impact Statement (EIS).

Abstract: This EIS was prepared in compliance with DAF's *Environmental Impact Analysis Process* for the Air Education and Training Command proposal to recapitalize its flight training program with newer and more capable T-7A Red Hawk aircraft at JBSA. This EIS was prepared to support the Secretary of the Air Force strategic basing decision to initiate recapitalization efforts at existing T-38C training installations with JBSA-Randolph as the initial site to support pilot instructor pilot training. The Proposed Action calls for JBSA-Randolph to incrementally receive 72 T-7A aircraft during the period from 2023 through 2028, and T-38C Talon aircraft currently operating from JBSA-Randolph would be incrementally reduced from 91 to zero from 2024 through 2031. Primary flight operations would occur at JBSA-Randolph; secondary flight operations would occur at JBSA-Lackland and Seguin AAF. No changes to established Special Use Airspace configurations (i.e., size, shape, or location) would be required to support the proposed operations of the T-7A aircraft. Mission enhancements as part of recapitalization would increase the number of personnel on JBSA-Randolph by approximately 300, and six military construction projects and 13 facilities sustainment, restoration, and modernization projects would occur at JBSA-Randolph to provide modern facilities and infrastructure to support the T-7A aircraft's maintenance, training, and operational requirements. Three additional action alternatives with varying operational intensities are evaluated as Alternatives 1, 2, and 3 to the Proposed Action as well as the No Action Alternative.

The Proposed Action includes a phased total transition from current T-38C to T-7A aircraft operations at levels projected by the implementing plan. The number of training operations would vary over the implementation period and would continue to include daytime training operations and introduce up to 5,952 annual nighttime training operations. The nighttime operations would occur at JBSA-Randolph (5,664 per year) and JBSA-Lackland (288 per year); Seguin AAF does not have the capabilities to support nighttime operations.

Alternative 1 proposes 56 T-7A aircraft and a reduced number of operations at a level that would allow aircraft ozone precursor emissions to comply with limits for new sources in a non-attainment area. Up to 4,065 annual nighttime T-7A operations would be conducted at JBSA-Randolph and 225 at JBSA-Lackland at full implementation of the T-7A in Fiscal Year 2028.

Alternative 2 would result in 72 T-7A aircraft and considers the transitional T-38C and T-7A aircraft operations occurring at 115 percent of the operations presented in the Proposed Action.

At full implementation, this alternative would include 6,514 annual nighttime training operations at JBSA-Randolph and 331 annual nighttime training operations at JBSA-Lackland.

Alternative 3 also would result in 72 T-7A aircraft but considers operations up to 125 percent of those presented in the Proposed Action at full implementation. This alternative would include annual nighttime training operations numbering up to 7,080 at JBSA-Randolph and 360 at JBSA-Lackland.

Due to the impacts identified to air quality and aircraft noise with the implementation of the T-7A aircraft and the lack of operational data associated with engine and aircraft emissions, DAF will employ an adaptive management strategy to better define potential impacts as better information becomes available. The T-7A is a new aircraft not yet in the DAF inventory and still undergoing flight testing with the manufacturer. Specific discussion of adaptive management measures has been incorporated into the environmental consequences for both the air quality and noise resource areas. As a result of implementing an adaptive management strategy, mitigation measures have been identified that result in mitigated versions of the Proposed Action and alternatives reducing the noise related impacts.

Written inquiries regarding this document should be directed by mail to Mr. Nolan Swick, AFCEC/CZN, Attn: JBSA T-7A Recapitalization EIS, Headquarters Air Education and Training Command Public Affairs, 100 H. East St, Ste 4, Randolph AFB, Texas 78150.

Final

ENVIRONMENTAL IMPACT STATEMENT

FOR

T-7A RECAPITALIZATION

AT

JOINT BASE SAN ANTONIO, TEXAS

AIR EDUCATION AND TRAINING COMMAND

FEBRUARY 2022

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1. Purpose of and Need for the Proposed Action

1.1 Introduction

This Environmental Impact Statement (EIS) was prepared in compliance with the United States Department of the Air Force's (DAF's) *Environmental Impact Analysis Process* (EIAP) for the Air Education and Training Command (AETC) proposal to recapitalize its flight training program with newer and more capable T-7A[2] Red Hawk aircraft at Joint Base San Antonio (JBSA)-Randolph, Texas. Recapitalization is the acquisition of the new generation T-7A aircraft and construction and upgrade of specific facilities to support the pilot training and, operations and maintenance of the T-7A aircraft. Current pilot training courses conducted at JBSA-Randolph (i.e., Pilot Instructor Training [PIT] and Introduction to Fighter Fundamentals [IFF]) would transition to the T-7A aircraft from currently used T-38C Talon aircraft. Subsequent T-7A recapitalization may occur at other T-38C training locations, but those are separate actions that will be analyzed in installation-specific NEPA documents and are not considered within the scope of this EIS, which covers T-7A recapitalization only at JBSA-Randolph.

This EIS analyzes the significance of the environmental impacts associated with the Proposed Action and its alternatives, including the No Action Alternative. The environmental documentation process associated with preparing this EIS was carried out in compliance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (Title 40 Code of Federal Regulations [CFR] §§1500–1508[3]); and the DAF regulations for implementing NEPA (32 CFR § 989, as amended).

1.2 The T-7A Recapitalization Program

In a Memorandum for Record dated February 16, 2018, the Secretary of the Air Force determined that JBSA-Randolph was the preferred alternative and Columbus, Laughlin, Sheppard, and Vance Air Force Bases as reasonable alternatives for the T-7A. DAF proposes to recapitalize the AETC T-38C aircraft fleet with the T-7A aircraft. JBSA-Randolph conducts the majority of DAF's Pilot Instructor Training and is an Introduction to Fighter Fundamentals location. The level of training conducted at the other bases is different than the level of training at JBSA-Randolph. DAF pilot training relies on a unique runway structure and special use airspace capable of supporting high volume pilot training, limiting the enterprise of potential bed-down installations to the five existing pilot training installations. DAF evaluated each installation using criteria that included mission factors (weather and the ability to meet syllabus requirements), infrastructure capacity, as well as potential environmental constraints and costs. These criteria were planning decisions that assisted in establishing the initial scope of this EIS,

[2] The aircraft was referred to as "T-X" in the Notice of Intent and scoping materials. T-X was an interim designation used prior to the official T-7A model number being established.

[3] The EIAP for this EIS began with the Notice of Intent, which was published prior to the promulgation of CEQ's July 16, 2020, final rule updating the regulations implementing the procedural provisions of NEPA. As such, DAF will follow the previous CEQ rules throughout this EIAP in accordance with 40 CFR § 1506.13.

whether to implement the proposed action is still subject to the NEPA and related regulatory processes. In this EIS, JBSA-Randolph was proposed for environmental analysis pursuant to NEPA due to the nature and level of training accomplished there. The other training bases (Columbus, Laughlin, Vance, and Sheppard) will be subject to separately prepared NEPA analysis.

1.2.1 Aircraft and the T-7A Recapitalization Program

The T-38 is a twin-engine, high-altitude, supersonic jet used by DAF and other nations for pilot training. The aircraft originally was developed in the 1950s with production occurring between 1961 and 1972. The fleet has undergone periodic upgrades over time. In 2001, DAF upgraded several hundred T-38s with modern avionics and replaced propulsion components to provide increased performance and superior reliability. AETC uses the T-38C to train airmen for various fighter and bomber aircraft including the F-15C Eagle, F-15E Strike Eagle, F-16 Fighting Falcon, F-35 Lightning II, B-1B Lancer, A-10 Thunderbolt, and F-22 Raptor (DAF 2014a).

Training with the older T-38C aircraft fails to prepare pilots for the technological advancements of fourth and fifth generation aircraft including nighttime flight training. “Fourth generation aircraft” refers to those aircraft developed or manufactured with updated variants in the later part of the twentieth century such as the F-15E or the F-16. “Fifth generation aircraft” refers to modern aircraft with advanced avionics developed in the early part of the twenty-first century such as the F-22 and F-35. Furthermore, the T-38C aircraft is incurring greater maintenance requirements as it ages. Greater maintenance issues lead to more downtime of the aircraft, which threatens the availability of pilot training hours.

DAF would recapitalize the T-38C aircraft fleet with the T-7A aircraft across all Specialized Undergraduate Pilot Training Bases. Program-wide, DAF would procure approximately 350 T-7A aircraft.

1.2.2 Why JBSA-Randolph?

To prepare for accepting the T-7A aircraft at each proposed location, AETC developed a geographically sequenced replacement plan that initiates T-7A aircraft replacement activities at JBSA-Randolph before the other training locations. DAF selected JBSA-Randolph to be the first base to receive the T-38 aircraft to avoid retrograde training (avoid training Specialized Undergraduate Pilot Training students in the T-7A, then send them to Introduction to Fighter Fundamentals training in the T-38C), minimize transition inefficiencies and flow all Specialized Undergraduate Pilot Training graduates going to fifth generation platforms through the T-7A Fighter Fundamentals course as soon as possible. Further, JBSA-Randolph pilot instructor training program has the largest throughput of instructor pilots, is also the primary Introduction to Fighter Fundamentals location for non-Euro-NATO Joint Jet Pilot Training, and establishes a T-7A instructor pilot pipeline and sets the conditions to transition to T-7A training at other locations.

DAF has identified JBSA-Randolph for continued PIT and IFF training for its location and access to available airspace and alternate airfields used for approaches and departures or overhead patterns. This airspace has historically met the needs of the training curriculum and is a

valuable asset to support the training. The weather and available flying days also make JBSA-Randolph a preferred location for the continuing training program.

The focused Proposed Action analyzed in this EIS is T-7A recapitalization at JBSA-Randolph using 72 T-7A aircraft and sufficient operations to fully meet all T-7A training requirements. The T-7A aircraft would be assigned to JBSA-Randolph where primary flight operations would occur; secondary flight operations would occur at JBSA-Lackland and Seguin Auxiliary Airfield (AAF). Training operations within the airspace of all Special Use Airspace (SUA), ranges, alternative airfields, and Military Training Routes (MTRs) that are currently used by the T-38C aircraft would continue with the T-7A. JBSA-Randolph would be the initial installation for T-7A recapitalization throughout DAF. All current JBSA-Randolph T-38C aircraft would be transitioned out of the training programs and considered for retirement or repurposed for use at other locations. A detailed description of the Proposed Action is provided in **Section 2.1**.

1.3 Purpose of and Need for Action

1.3.1 Purpose of the Proposed Action

As noted in the Secretary of the Air Force Strategic Basing Decision Memorandum of February 16, 2018, DAF will recapitalize the Air Education and Training Command T-38C aircraft fleet with the T-7A aircraft at Specialized Undergraduate Pilot Training bases in order to support fifth generation fighter training requirements. The purpose of the Proposed Action of this EIS is to implement the T-7A recapitalization program at JBSA-Randolph to establish a source of T-7A instructor pilots as well as prepare pilots to operate the more technologically advanced aircraft.

1.3.2 Need for the Proposed Action

The Proposed Action is needed because the current training practices with the older T-38C aircraft fail to prepare pilots for the technological advancements of fourth and fifth generation aircraft. By 2031, more than 60 percent of the Combat Air Force will be comprised of fifth generation aircraft, which requires a modern and capable training platform with capabilities beyond that currently available in the T-38C. Training systems provided with the newer T-7A aircraft allow for enhanced and improved flight and simulator training. The curriculum for T-7A training would initially remain consistent with current training for the T-38C with the addition of nighttime flying; however, it may be modified as the training with the T-7A and knowledge of the aircraft capabilities and handling becomes more known. As a result, the T-7A recapitalization program would allow DAF to provide more efficient and effective instructor and pilot training for operating fourth and fifth generation aircraft. The T-7A recapitalization at JBSA-Randolph would allow DAF to establish a sustained cadre of T-7A pilot instructors and meet established DAF pilot training requirements. As noted in the attachments to the Secretary's Strategic Basing Decision Memorandum, "basing the first T-7A aircraft at JBSA-Randolph meets the AETC Commander's objectives of optimizing total T-7A training."

1.4 Background

1.4.1 Location, Airfields, and Airspace

JBSA. JBSA was created following a 2005 Base Realignment and Closure recommendation to consolidate functions at the various military installations in the Greater San Antonio region into a single base commanded by DAF. JBSA is comprised of three primary sites (i.e., JBSA-Randolph, JBSA-Lackland, and JBSA-Fort Sam Houston) and eight other operating sites. Seguin AAF is one of those other operating sites. The following subsections discuss the JBSA installations affected by the Proposed Action and alternatives.

JBSA-Randolph. JBSA-Randolph is the focus of this EIS as it is designated as the first location to receive T-7A aircraft to replace the existing T-38C aircraft as explained in **Section 1.2.2**.

JBSA-Randolph is the headquarters for AETC and is located approximately 13 miles northeast of the center of San Antonio on 2,894 acres in the northeastern corner of Bexar County (see **Figure 1-1**). Bounding the installation are the municipalities of Converse to the west, Universal City to the northwest, and Schertz to the north, east, and south. The installation is located between Interstate 10 to the south and Interstate 35 to the north.

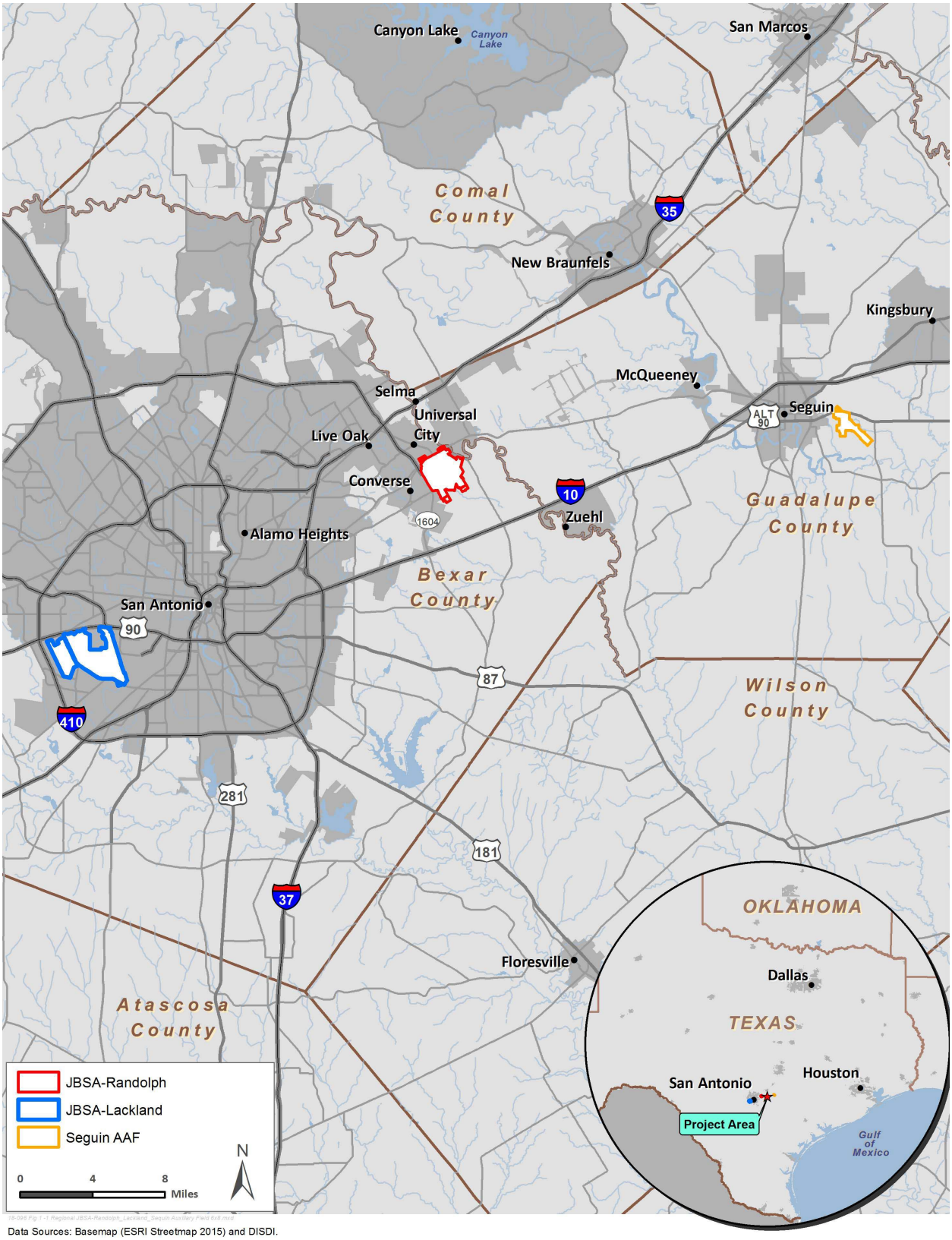
JBSA-Randolph was established as a flight training facility for the United States Army Air Corps in 1931 when the Air Corps Training Center headquarters moved to Randolph Airfield, and primary and basic pilot training for cadets and student officers began on November 2, 1931. Primary training courses continued until 1939 when the mission of Randolph Airfield changed to basic pilot training. In March 1943, the Central Instructor School was established, and the cadet pilot training program was replaced by pilot instructor training. In 1947, DAF became a separate service from the Army Air Forces, and Randolph Airfield was named Randolph Air Force Base (AFB) (DAF 2017a).

JBSA-Randolph has a unique design with the building area centered on the field, streets laid out concentrically, and the aircraft ramps and parallel runways situated on the eastern and western sides of the installation perimeter. The airfield is equipped with two Class B parallel runways running northwest/southeast on opposing sides of the installation. Class B runways are primarily used by large, heavy, and high-performance aircraft. Runway 15L/33R (the “east runway”) measures 8,351 feet long and 200 feet wide and runs along the northeastern border of JBSA-Randolph. Runway 15R/33L (the “west runway”) measures 8,352 feet long and 200 feet wide and runs along the southwestern border of JBSA-Randolph. The overruns at the ends of each runway are 1,000 feet long. The airfield elevation is 762 feet above mean sea level. The east runway has a high-intensity approach lighting system with centerline-sequenced flashers, and the west runway has precision approach path indicators. An Instrument Landing System is a highly accurate radio signal navigation-aid providing aircraft with horizontal and vertical guidance (DAF 2017a).

JBSA-Randolph’s airfield hours of operation are 7 a.m. to 7 p.m., Monday through Friday and 1 p.m. to 4 p.m. on Sunday. Current hours of operation and the schedule for weekend hours or holidays are published by the Department of Defense (DoD) or Federal Aviation Administration

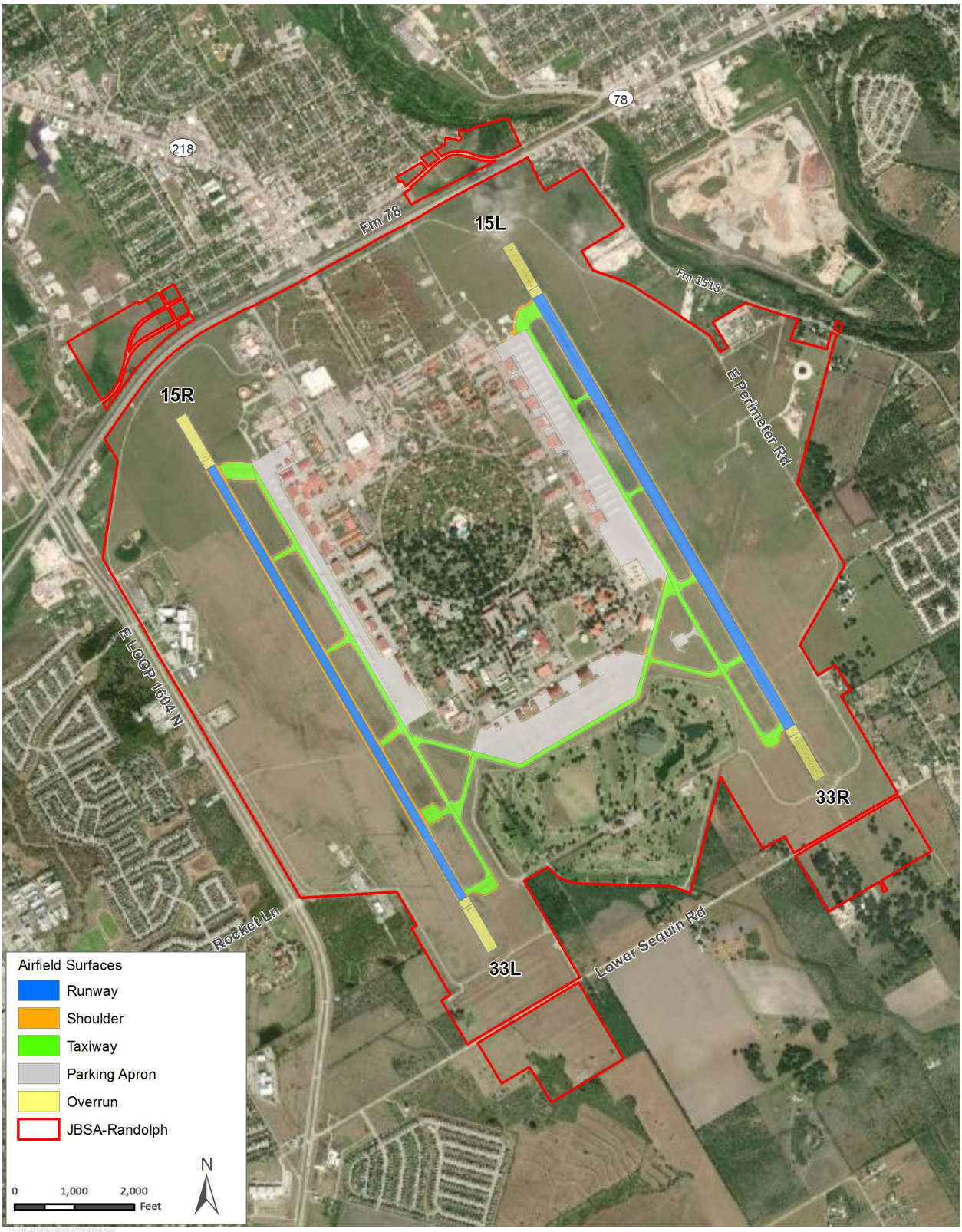
(FAA) in Notices to Airmen. Extenuating circumstances can result in extended operating hours or suspended operations. The airfield may be temporarily closed in consideration of landing area conditions, crash crew equipment availability, status of navigational aids, and severe weather conditions (DAF 2017a). **Figure 1-2** shows the JBSA-Randolph airfield.

JBSA-Lackland. JBSA-Lackland supports a variety of training squadrons and is the sole location for DAF enlisted Basic Military Training. The installation is in Bexar County approximately 4.5 miles southwest of downtown San Antonio and consists of approximately 8,800 acres. JBSA-Lackland also leases parcels at a civilian-operated industrial complex at the eastern end of the installation. JBSA-Kelly Field Annex contains the only runway at JBSA-Lackland. Bounding the installation are the San Antonio neighborhoods of Edgewood to the north, Quintana Community to the east, and Valley Forest to the south. The installation is located south of U.S. Highway 90, also known as the Cleto Rodriguez Freeway.



Data Sources: Basemap (ESRI Streetmap 2015) and DISDI.

Figure 1-1. JBSA-Randolph, JBSA-Lackland, and Seguin AAF Locations



Data Sources: JBSA-Randolph GIS and Imagery (Esri 2015).

Figure 1-2. JBSA-Randolph Airfield

JBSA-Lackland is home to the 37th Training Wing, which is the largest training wing in DAF and oversees five technical training schools on the installation to process more than 90,000 personnel across all military branches yearly (JBSA 2018a).

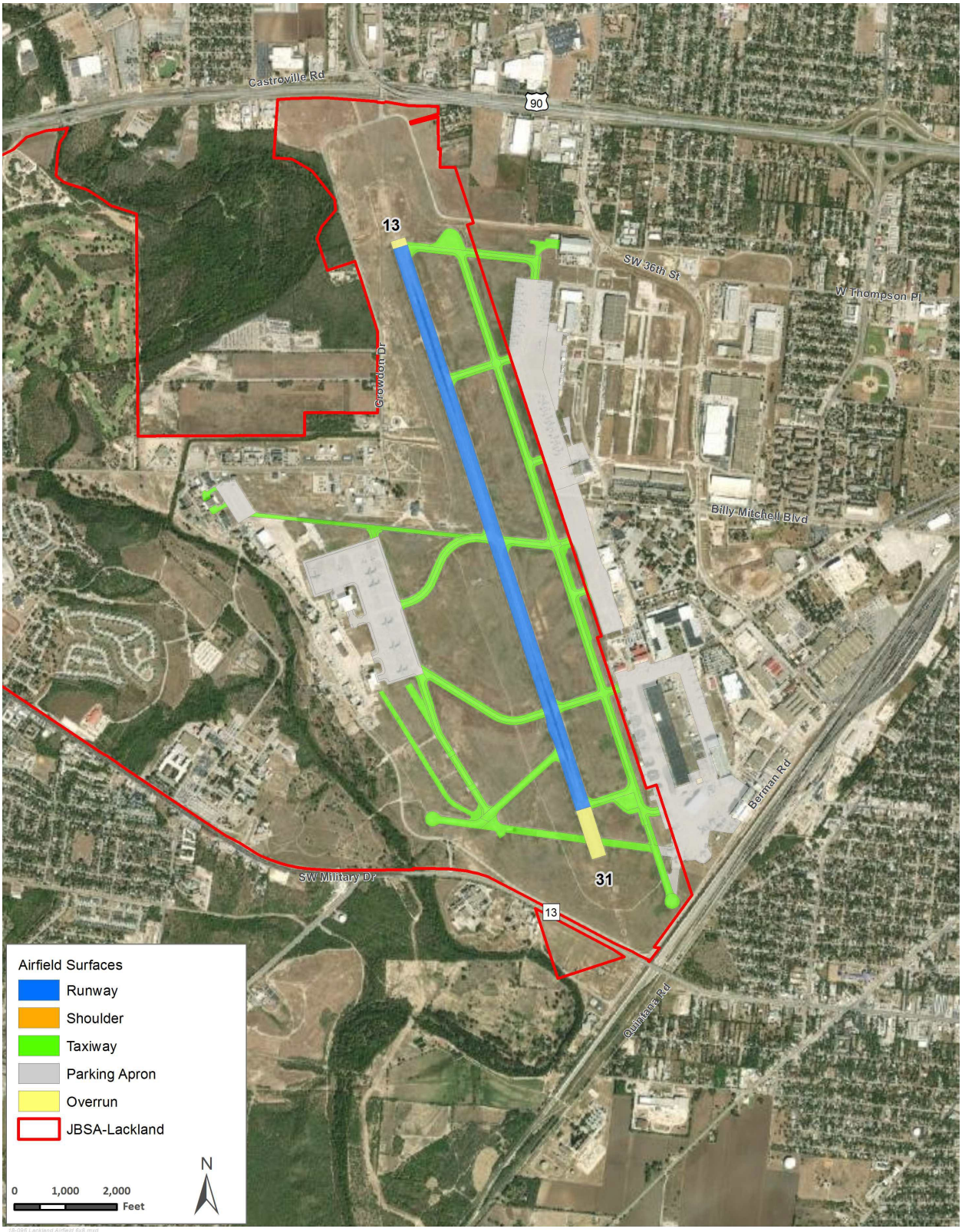
JBSA-Lackland was constructed in the early 1940s and was originally a part of Kelly Field before becoming an independent organization in 1942. In 1948, following the establishment of DAF as a separate branch of the military, Kelly Field was renamed Kelly AFB and the area that is now known as JBSA-Lackland was renamed Lackland AFB. The installation gained a flying mission following the Base Realignment and Closure actions of Kelly AFB in 2001. JBSA-Lackland now includes the main base, Kelly Field Annex, and Medina Annex, which serves as a training facility (JBSA 2018a).

The Kelly Field Annex airfield, which is shared between military personnel and civilians, contains one 11,500 foot-long × 300-foot-wide runway (Runway 13/31) that runs in a northwest/southeast direction (see **Figure 1-3**). The runway is primarily used by C-5, F-16, transient aircraft, and aircraft being maintained/repaired by privately owned facilities (JBSA 2018a).

Seguin AAF. Seguin AAF is a 956-acre training field used for T-38C approaches and touch-and-go operations. Seguin AAF is an asset of JBSA and supports T-38C pilot training operations from JBSA-Randolph. It is located approximately 25 miles east of JBSA-Randolph and 1 mile east of the City of Seguin along U.S. Highway 90 in Guadalupe County (see **Figure 1-1**).

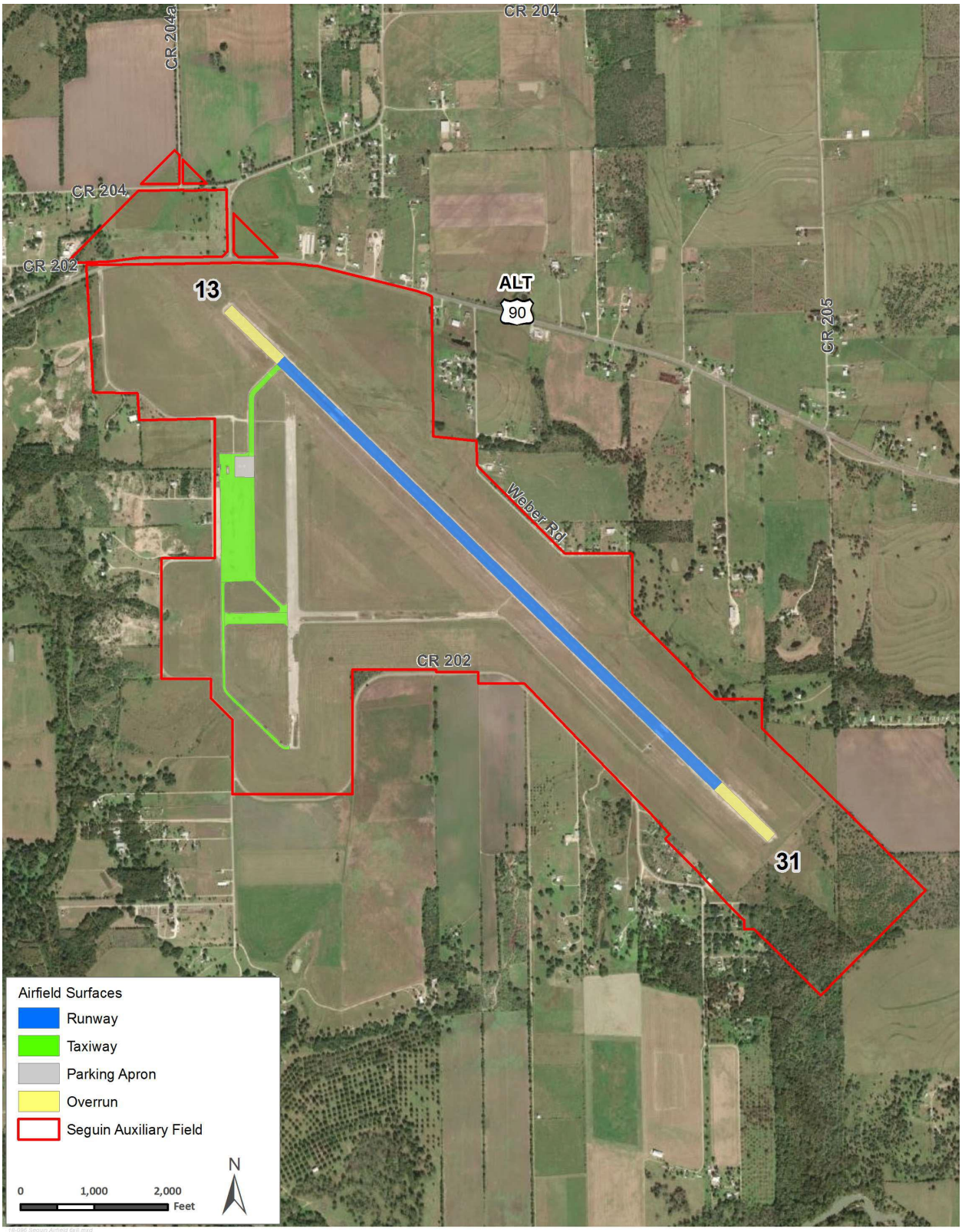
Seguin AAF operates a single Class B runway designated Runway 13/31 and measuring 8,350 feet long and 150 feet wide. The 560th Flying Training Squadron, which qualifies pilots as T-38C Instructor Pilots, is the primary user of Seguin AAF and uses the field for most of its touch-and-go training. The airfield operates from sunrise to sunset Monday through Friday and is closed at night, on weekends, and federal holidays. The airfield does not have lighting or a control tower; however, a manned Runway Supervisor Unit is used for observation and safety control during daytime flight operations. The airfield is not capable of supporting nighttime flight operations. Additionally, the airfield is equipped with fire and rescue assets (DAF 2017a). **Figure 1-4** shows Seguin AAF.

Airspace. T-38C aircraft stationed at JBSA-Randolph use a variety of airspace in the south-Texas area to perform aircraft operations and supplement training in and around the airfields mentioned. This airspace includes SUA and MTRs that are approved by FAA and designated on published aeronautical charts. **Figure 1-5** shows the designated airspace used for T-38C pilot training in the area. Additional definition of the existing airspace used by T-38C aircraft is provided in **Section 3**.



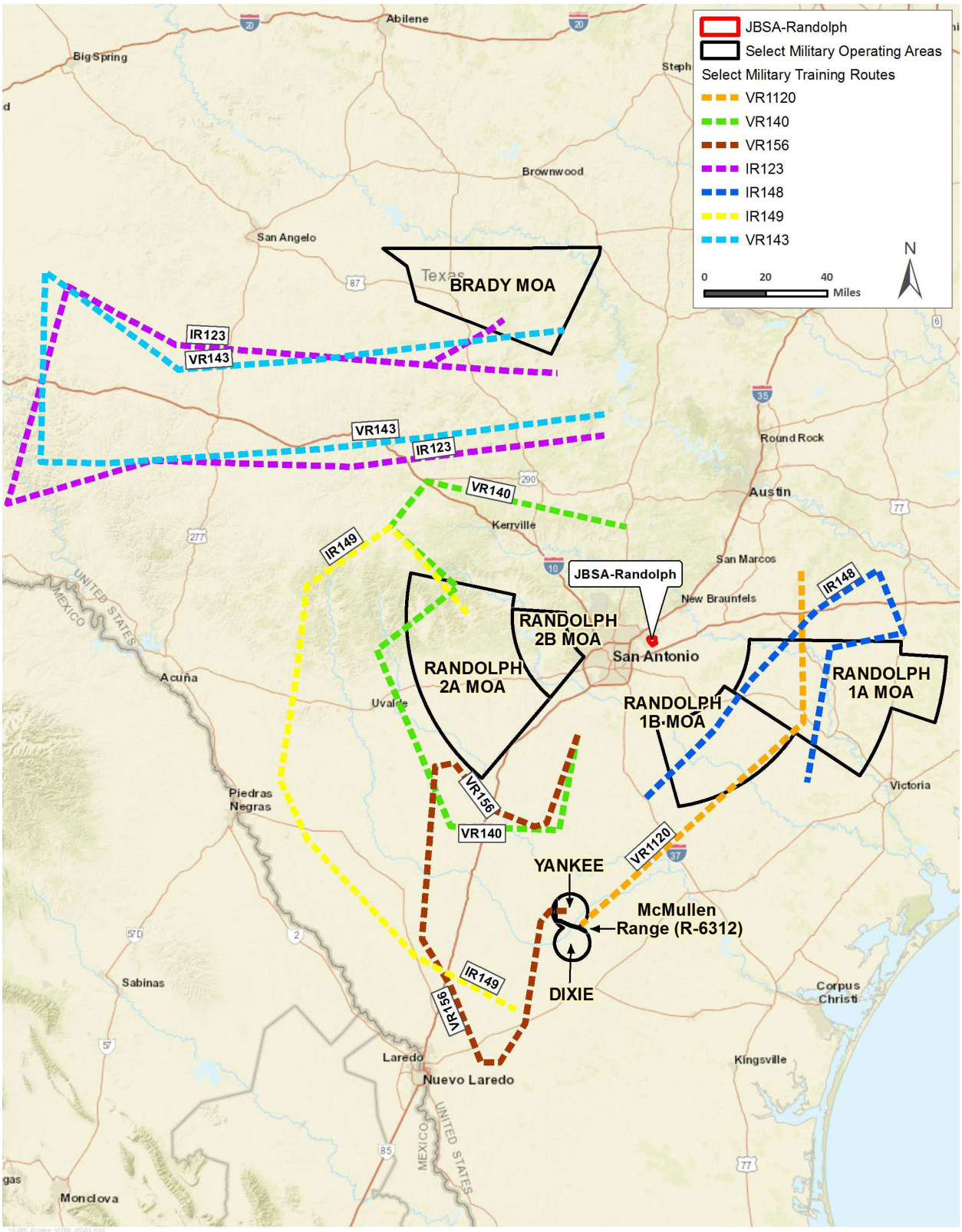
Data Sources: JBSA-Randolph GIS and Imagery (Esri 2015).

Figure 1-3. Kelly Field Annex Airfield (JBSA-Lackland)



Data Sources: Seguin GIS and Imagery (Esri 2015).

Figure 1-4. Seguin Auxiliary Airfield



Data Sources: Basemap (ESRI Streetmap), FAA and DISDI.

Note: Width of MTRs not drawn to scale.

Figure 1-5. JBSA-Randolph T-38C Training Airspace in South Texas

1.5 National Environmental Policy Act and Other Compliance Requirements

NEPA is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before those actions are taken. NEPA helps decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. The CEQ process for implementing NEPA is codified in 40 CFR §§1500–1508. CEQ regulations specify that an EIS be prepared to provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives that will avoid or minimize adverse impacts or enhance the quality of the human environment.

Air Force Policy Directive 32-70, *Environmental Quality*, states that DAF will comply with applicable federal, state, and local environmental laws and regulations, including NEPA. DAF's implementing regulation for NEPA is 32 CFR § 989, as amended, which is the controlling document for the EIAP.

In compliance with NEPA, DAF has prepared this EIS as the appropriate level of the EIAP for the Proposed Action and alternatives described in **Section 2**. This EIS identifies whether or not the Proposed Action and its alternatives would result in significant impacts. If significant impacts are predicted, then DAF would decide the appropriate mitigation measures to reduce impacts. This EIS will also be used to guide DAF in implementing the Proposed Action in a manner consistent with DAF standards for environmental stewardship should the Proposed Action be approved for implementation.

Comments from the public and stakeholders were solicited during a 45-day comment period. When providing input on the EIS, DAF requested comments be substantive in nature. Substantive comments generally include, but are not limited to, comments that identify potential environmental impacts for analysis, identify reasonable alternatives for analysis, identify feasible mitigations for consideration, or otherwise recommend relevant information that should be considered in the development of the Draft EIS. Non-substantive comments generally include, but are not limited to, comments that express a conclusion, an opinion, or a vote for or against the proposal itself, or some aspect of it; that state a position for or against a particular alternative; or that otherwise state a personal preference or opinion. All comments received on this proposal will be included in the Administrative Record regardless of when they were received and regardless of their substantive or non-substantive nature.

DAF is required to manage floodplains and wetlands in accordance with Air Force Manual 32-7003, *Environmental Conservation*, which includes the DAF guidance for compliance with Executive Order (EO) 11988, *Floodplain Management*, and EO 11990, *Protection of Wetlands*. DAF has not identified any floodplains or wetlands that have the potential to be disturbed by the Proposed Action and alternatives described in **Section 2**. See **Section 3.9** for further details on wetlands and floodplains.

1.6 Intergovernmental and Stakeholder Coordination

NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. CEQ NEPA regulations state, "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action. This process shall be termed scoping." EO 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416, *Intergovernmental Review of Federal Programs*, requires federal agencies to provide opportunities for input from elected officials of state and local governments that would be directly affected by a federal proposal.

In compliance with NEPA, DAF notified relevant agencies, stakeholders, and federally recognized Native American tribes about a proposed action and its alternatives. The notification process informs these parties of potential impacts that could occur and provides them with the opportunity to comment. For this Proposed Action, a Notice of Intent to Prepare an EIS was published in the *Federal Register* on February 6, 2019. A Notice of Public Scoping Meetings was published in the *San Antonio Express-News* and *Seguin Gazette* on the dates shown in **Table 1-1**. The Public Scoping Period ended on April 5, 2019.

Table 1-1. Public Scoping Newspaper Notices

Newspaper	Date	Ad Type
San Antonio Express-News	March 4, 2019	Notice of Public Scoping Meeting
Seguin Gazette	March 5, 2019	Notice of Public Scoping Meeting
San Antonio Express-News	March 14, 2019	Notice of Public Scoping Meeting
Seguin Gazette	March 15, 2019	Notice of Public Scoping Meeting

1.6.1 Public Scoping

Two open house formatted public scoping meetings were conducted at the following locations:

- March 19, 2019 in Universal City: Olympia Hills Golf & Event Center, 12900 Mt. Olympus, Universal City, Texas, from 5 p.m. to 8 p.m.
- March 20, 2019 in the City of Seguin: Midway Hall, 728 Midway, Seguin, Texas, from 5 p.m. to 8 p.m.

In total, seven comment correspondences were received during the public scoping period from two individuals, one federal agency, three state agencies, and one non-governmental organization. The following is a summary of the substantive scoping comments received:

- A citizen requested consideration of extending the north takeoff pattern from Seguin AAF because of noise on right turn.
- Inquiry as to whether the action would involve a change to airspace.
- A request to evaluate the presence of wetlands within the project area.
- A recommendation that new structures be constructed in areas that avoid the need to clear trees and if needed, conduct nest surveys.

- A recommendation to include pollinator-friendly species into post-construction revegetation or landscaping plans for the new facilities.

1.6.2 Draft EIS Public Comment Period

The Draft EIS public comment period began when the Notice of Availability of the Draft EIS was published in the *Federal Register* on October 15, 2021 (see **Appendix A**) and ended on November 29, 2021. Notification of the Notice of Availability and announcement of a virtual public hearing was mailed to federal, state, local, tribal, and public stakeholders and published in local newspapers in October and November 2021 as shown in **Appendix A**. To further increase public awareness and participation leading up to the virtual public hearing, local county and city governments were provided e-notices to post on their websites.

One virtual public hearing was held on November 16, 2021, and the transcript from the hearing is provided in **Appendix A**. No verbal comments were received during the virtual public hearing.

During the Draft EIS public comment period, written public comments were submitted to DAF via the website. Substantive comments included concerns on:

- Aircraft noise
- Presence of large birds in the training aircraft airspace
- Planned housing development in Seguin, Texas.

The comments received and DAF responses to address public comments are included in **Appendix A**.

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2. Description of the Proposed Action and Alternatives

This section presents information on the Proposed Action and alternatives for the proposed T-7A recapitalization at JBSA-Randolph. **Section 2.1** provides a detailed description of the specific JBSA-Randolph recapitalization Proposed Action. **Section 2.2** describes the process used to identify and evaluate potential alternatives to implement the Proposed Action, while **Section 2.3** discusses the No Action Alternative. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is included for analysis as required by CEQ and DAF regulations for implementing NEPA. Lastly, **Section 2.4** provides information on the selection of the Preferred Alternative.

2.1 Proposed Action

The Proposed Action is T-7A recapitalization at JBSA using 72 T-7A aircraft and sufficient operations to fully meet all T-7A training requirements. The T-7A aircraft would be assigned to JBSA-Randolph where primary flight operations would occur. Secondary flight operations would occur at JBSA-Lackland, Seguin AAF, and within the existing designated airspace where T-38C aircraft currently operate. The initial delivery and operation of T-7A aircraft would occur in 2023. T-7A aircraft operations would be phased in with both T-38C and T-7A operations occurring simultaneously through 2031. All flight operations would take place within existing airspace and no additions to, or alterations of airspace would occur under the Proposed Action. Facility construction and upgrades through six military construction (MILCON) and 13 facilities sustainment, restoration, and modernization (FSRM) projects would be implemented and coordinated with T-7A aircraft arrival. Aircraft, aircraft operations, personnel, and facility requirements are described in detail in **Sections 2.1.1** through **2.1.4**.

2.1.1 Aircraft

T-7A aircraft would be phased in over several years. When all T-7A deliveries are complete in 2028, 72 T-7A aircraft would be stationed at JBSA-Randolph. Currently, 91 T-38C aircraft are assigned to JBSA-Randolph; however, some of these aircraft are loaned out to other T-38C training installations and may return to JBSA-Randolph as shown with increasing T-38C aircraft numbers in years 2023 and 2024 in **Table 2-1**. The proposed aircraft implementation schedule is provided **Table 2-1**. As T-7A aircraft are incorporated into the training curriculum, the number of T-38C aircraft at JBSA-Randolph would be reduced. However, this would not occur at a one-for-one change in number of aircraft or operations. The change of aircraft would result in a larger number of total aircraft operating at JBSA-Randolph over the course of the T-38C to T-7A transition period. The increase in total aircraft operations during the transition is due to simultaneous T-38C and T-7A concurrent training for the existing PIT and IFF missions.

Table 2-1. Cumulative Number of Aircraft and Operations under the Proposed Action

Aircraft	2017 Baseline	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032 and Later
Number of Aircraft Stationed at JBSA-Randolph											
T-38C	91	97	96	85	78	62	41	34	29	15	0
T-7A	0	8	18	25	39	58	72	72	72	72	72
Total	91	105	114	110	117	120	113	106	101	87	72
Operations at JBSA-Randolph											
Annual Aircraft Operations (Daytime)											
T-38C	97,000	131,100	131,100	113,333	103,517	79,406	55,936	46,691	35,718	18,845	0
T-7A	0	4,538	13,170	29,592	45,642	75,789	102,173	105,209	106,927	106,263	114,212
Total	97,000	135,638	144,270	142,925	149,159	155,195	158,109	151,900	142,645	125,108	114,212
Annual Aircraft Operations (Nighttime)[1]											
T-7A	0	320	184	1,912	3,072	4,400	5,520	5,712	5,664	5,664	5,664
Operations at JBSA-Lackland											
Annual Aircraft Operations (Daytime)											
T-38C	400	400	390	320	280	200	150	120	80	0	0
T-7A	0	40	64	296	480	680	792	864	888	896	928
Total	400	440	454	616	760	880	942	984	968	896	928
Annual Aircraft Operations (Nighttime)											
T-7A	0	20	16	96	160	224	256	280	288	288	288
Operations at Seguin AAF											
Annual Aircraft Operations (Daytime)											
T-38C	42,000	57,400	56,700	46,100	39,800	28,700	21,100	16,700	10,800	2,680	0
T-7A	0	645	2,880	13,200	21,200	30,320	35,280	38,560	39,440	39,920	41,200
Total	42,000	58,045	59,580	59,300	61,000	59,020	56,380	55,260	50,240	42,600	41,200
Operations within Airspace Training Areas (MOAs, Ranges, & MTRs)[2]											
Annual Aircraft Operations within the Training Airspace											
T-38C	13,641	18,436	18,436	15,938	14,558	11,166	7,866	6,566	5,023	2,650	0
T-7A	0	683	1,878	4,430	6,850	11,277	15,144	15,598	15,833	15,740	16,858
Total	13,641	19,119	20,314	20,368	21,408	22,443	23,010	22,164	20,856	18,390	16,858
Annual T-7A Aircraft Operations Below 3,000 feet AGL within the Training Airspace											
T-7A	0	237	651	1,535	2,373	3,906	5,246	5,403	5,484	5,516	5,903

Sources: LPES 2021, AFCEC/CZTQ 2021

Table 2-1 Notes:

1. Nighttime operations would only occur at JBSA-Randolph and JBSA-Lackland and only involve T-7A aircraft.
2. Operations for Airspace Training are a total number of aircraft operations. The various MOAs and MTRs will experience varying levels of operations within the total number of operations shown.

What is an Aircraft Operation?

In **Table 2-1** for the Proposed Action and corresponding tables for Alternatives 1, 2, and 3, the number of projected aircraft operations are provided as a means to analyze both the air quality and noise impacts from aircraft flights. For the purposes of these tables, an aircraft operation is defined as (1) a single takeoff; (2) a single landing; (3) the approach phase of a closed pattern, or (4) the takeoff phase of a closed pattern. Closed pattern operations often include a "touch-and-go," where the aircraft approaches the airfield, momentarily touches its wheels or flies close to the runway, and departs the airfield for additional flight maneuvers.

Often, aircraft operations are discussed using the term "sorties." A single aircraft sortie includes one takeoff and one landing and may include closed patterns during flight. Aircraft operating from training installations such as JBSA-Randolph typically include multiple patterns flown with each sortie. In the case of the operations at JBSA-Randolph, an average of approximately 2.2 closed patterns (totaling 4.4 closed pattern operations) are conducted during each sortie. Actual sorties flown may include fewer closed patterns and some will include more than the average number used to calculate the total number of operations.

An example of how sortie information was used to calculate the number of operations presented for the Proposed Action and Alternatives follows: If 10,000 sorties were flown in any single year, the table would show a total number of 64,000 aircraft operations for that year (10,000 of the operations would be takeoffs, 10,000 would be landings, and the remaining 44,000 operations would be closed pattern operations [22,000 approach phase of a closed pattern and 22,000 takeoff phase of a closed pattern]).

The T-38C aircraft currently operating at JBSA-Randolph would be phased out of the current pilot training program. Those removed from supporting the training program would be considered for retirement or repurposed for use at other locations. Any change to these plans resulting in the potential reuse and relocation of T-38C aircraft will be a separate DAF action and will be subject to separate environmental analysis.

2.1.2 Aircraft Operations[4]

Aircraft operations would gradually shift from the T-38C to the T-7A in the PIT and IFF programs. Beginning in 2024, the current operations associated with T-38C would gradually decrease as T-7A are placed into service and would conclude at JBSA-Lackland by the end of 2030 and at JBSA-Randolph and Seguin AAF by the end of 2031. The annual number of aircraft operations for the T-38C and T-7A during the transition are provided in **Table 2-1**. DAF's program implementing plan calculated these annual operations as the baseline necessary for implementing the PIT and IFF training while simultaneously phasing out the T-38C aircraft and phasing in the T-7A aircraft. The proposed training syllabus for T-7A student pilots will remain the same as it currently is for T-38C students with the exception of the addition of nighttime flights due to the enhanced capabilities of the T-7A aircraft. The increase in total aircraft and operations during the transition is due to simultaneous T-38C and T-7A training for the PIT and IFF missions. T-7A annual operations would reach full capacity in 2032 and are projected to remain constant thereafter. Full capacity operations with the T-7A would exceed current baseline levels with the T-38C because of additional requirements in the training curriculum, which can be attributed to nighttime operations and anticipated but unknown changes in curriculum once the capabilities of the T-7A are fully known. A proportionate change in training operations at JBSA-Lackland and Seguin AAF would also occur.

As part of the T-7A recapitalization, all normal T-38C and T-7A operations at JBSA-Randolph would remain on Runway 15L/33R (the east runway) except during runway maintenance. The T-1 aircraft also primarily utilizes the east runway. During east runway closure, T-38C, T-7A and T-1 would conduct takeoff and landing operations on Runway 15R/33L (the west runway). Likewise, the T-6 aircraft operating at JBSA-Randolph would routinely use the west runway unless conditions dictate otherwise. T-38C aircraft undergoing depot maintenance functions would also continue to use the west runway.

The posted hours of operation for JBSA-Randolph's airfield would not change. The airfield would remain open between 7 a.m. and 7 p.m., Monday through Friday, and between 1 p.m. and 4 p.m. on Sunday. The airfield would normally remain closed on Saturdays and federal holidays. However, with the enhanced capabilities and avionics of the T-7A aircraft, the Proposed Action includes the introduction of evening and nighttime operations with the T-7A. The evening operations would include operations that occur from dusk until 10 p.m. Nighttime operations, by definition for aircraft noise modeling, occur between the hours of 10 p.m. and 7 a.m. on normal training days (**Section 3.2** contains an explanation of why nighttime operations are defined in this manner). Therefore, T-7A operations could occur at any time during each 24-hour day. It is likely that as times of sunrise and sunset change throughout the seasons, the

[4] Modifications to the aircraft operations (power settings and afterburner usage) for the Proposed Action are discussed in **Section 3.1** as a mitigation measure.

daily and hourly distribution of flight operations may vary to accommodate training curriculum requirements. At full implementation, up to 5,664 annual nighttime T-7A operations would occur at JBSA-Randolph and up to 288 annual nighttime T-7A operations would occur at JBSA-Lackland. It is not possible to predict at what exact times nighttime operations would occur, but typically they would not occur throughout the night and would normally be accomplished as early as possible to limit impacts such as sleep interference as discussed in **Section 3.2**. Projected operations include a one-year surge in nighttime operations at JBSA-Randolph during the transition period resulting in up to 5,712 nighttime operations over the course of the year in 2029. No nighttime operations would occur at Seguin AAF.

The T-7A would operate within the same region as the T-38C and use the same airspace now used including SUA, ranges, Military Operating Areas (MOAs), MTRs, and alternate airfields. Some of the airspace including VR143, IR123, IR148 and IR149 would not be immediately used by the T-7A; however, as the training curriculum for the new aircraft is updated these areas will likely be included for training. It is anticipated that similar levels would continue once the T-7A aircraft begin using that particular airspace. The current operating limits for the T-7A would be for flight at sub-sonic speeds only. (AFCEC/CZN 2021a).

No changes to airspace configurations (i.e., size, shape, or location) are required for T-7A recapitalization. DAF is in the initial stages of working with FAA to define proposals that would address existing airspace deficiencies for low altitude training in southcentral Texas. The need for low-level flight training for combat pilots is one that DAF is evaluating at multiple locations across the United States. The T-7A recapitalization would be considered for implementation at JBSA whether or not the low-level airspace modification proposal is pursued by DAF. Any T-7A aircraft addressed in this EIS would not use future proposed airspace until a full and complete analysis is completed. This would include analysis of air quality General Conformity Rule (GCR) requirements and other impacts that are required to support DAF and FAA decision making. This EIS only evaluates the training of pilots using the T-7A in existing training airspaces.

2.1.3 Personnel

During aircraft transition and at full T-7A implementation, there would be an overall increase in manpower at JBSA-Randolph. This increase is due to two distinct reasons:

1. ***Operations.*** During the transition period, DAF would be training pilots in two distinctly different Mission Design Series and maintaining different aircraft during the phase-in period resulting in an increase in manpower requirements for operations, civilian simulator instructors, and maintenance. The initial increase in manpower associated with JBSA-Randolph squadron operations and assigned aircraft would subside as T-38C aircraft are removed from service and would level out at approximately the initial aircraft operations manning level when all T-38C aircraft are removed from service.

2. ***Maintenance Training System.*** A long-term increase in manpower would occur because T-7A implementation includes a new requirement hosted at JBSA-Randolph. The introduction of a Maintenance Training System (MTS) would host instructors and students to train maintainers program-wide. T-7A maintenance students would be

temporarily assigned to JBSA-Randolph under temporary duty orders to receive training at the MTS facility. Specific manpower category allocations would be adjusted throughout the operational life of the T-7A based on economic, strategic, and political factors.

Table 2-2 provides each year's estimated cumulative total of the increase in manpower for T-7A operations, maintenance, and maintenance training system requirements through 2034 at JBSA-Randolph, reflecting both of the conditions above. The steady state manpower requirement is projected to be a 303-person increase. No change in manpower requirements would occur at JBSA-Lackland or Seguin AAF.

Associated with the manpower increase is a corresponding increase in the number of dependents (e.g., spouses, children, other family members) who would accompany the new personnel. DAF has estimated that in 2020 active-duty personnel were accompanied by 1.9 dependents on average (DAF 2018). Therefore, the estimated 303 employees at steady state implementation would be accompanied by 576 dependents for a total of 879 additional people in the Bexar County vicinity.

Table 2-2. Cumulative New Personnel and Dependents at JBSA-Randolph

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034 and Later
Personnel	28	68	85	145	193	272	275	275	275	273	305	305	303
Dependents	53	129	162	276	367	517	523	523	523	519	580	580	576
Total People	**81**	**197**	**247**	**421**	**560**	**789**	**798**	**798**	**798**	**792**	**885**	**885**	**879**

Sources: AETC 2017, DAF 2018

2.1.4 Facility Requirements

Potentially, six MILCON projects and 13 FSRM projects would occur at JBSA-Randolph to provide modern facilities and infrastructure to support the T-7A aircraft's maintenance, training, and operational requirements. No construction would occur at JBSA-Lackland or Seguin AAF. **Table 2-3** summarizes the amount of new impervious surface from the MILCON and FSRM projects.

2.1.4.1 MILCON Projects

The six MILCON projects are described as follows. **Figure 2-1** shows the proposed locations of the MILCON projects.

Table 2-3. Amount of Impervious Surface from the Proposed Action

Project	Construction Elements – ft^2	Current Site Condition	New Impervious Surface (ft^2)
MTS	Building – 30,000	Grassed area	40,330
	Paved Parking – 10,330	Grassed area	
GBTS	Building - 33,000 ft^2	Grassed area	43,125
	Paved Parking – 10,125	Grassed area	
Hush House Pad	Pad - 24,111	Paved	0
Fuel Cell	Building - 35,138	Paved	0
T-7A Shelters	Aircraft Pavement	Paved	0
Add/Alter T-7A Egress Facility	Building Addition – 3,739	Paved	0
Munitions Storage Facility	Storage Building – 1,855	Grassed area	1,855
Total New Impervious Surface			**85,310**

MTS Facility, Ball Field, and Tennis Courts. Construct a 30,000-square foot (ft^2) high-bay aircraft MTS facility with administrative space, classroom space, tool crib, communications room, and spaces to accommodate eight trainers. The MTS facility would train staff on maintenance of landing gear, fuel system, seat and canopy, avionics/cockpit, engine, hydraulics, auxiliary power unit/jet fuel starter, and flight control. The facility would include a steel-framed structure, concrete slab and foundation system, masonry block exterior walls, standing seam metal roof, fire suppression system, and all associated support facilities to provide a complete and useable facility. The MTS facility would be located on an existing ball field at the intersection of Fifth Street East and C Street East. The project would include a parking lot shared with the Ground Based Training System (GBTS) facility. The MTS portion of the lot would accommodate 51 vehicles and would be approximately 10,330 ft^2. Parking would be in the southwest portion of the site. The project would require the demolition and relocation of the softball field and tennis courts to another location. An adult softball field and tennis courts would be constructed across from Heritage Park (AETC 2019a, AETC 2019b). The precise MTS and GBTS configuration is still under design. **Figure 2-2** shows the combined site for the MTS and GBTS facilities, and **Figure 2-3** shows the site of the proposed relocated ball field and tennis courts.

Note: **Figure 2-2** is a preliminary representation of the placement of facilities within the site. The size and boundary of the parcel hosting the MTS, GBTS, and associated parking is expected to remain the same for analysis purposes, but the building configuration may change within the site.

Data Source: Imagery (ESRI 2015).

Figure 2-1. MILCON Project Locations

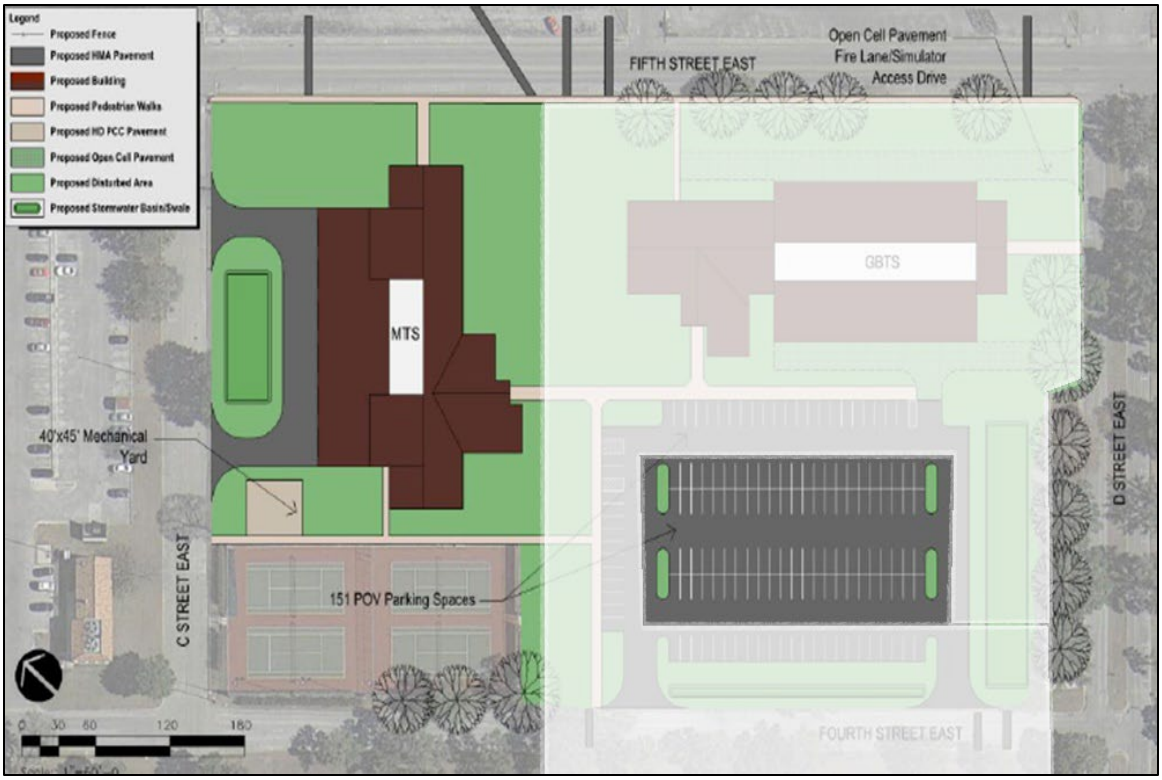


Figure 2-2. MTS Facility Site Plan

Figure 2-3. Ball Field/ Tennis Courts Site Plan

Ground Based Training System (GBTS) Facility. Construct a 33,000 ft^2 facility to hold a ground-based training simulator system facility, which consists of six weapon systems trainers, two operational flight trainers (both requiring eight large bays total), and two-unit training devices (requiring two smaller bays). The GBTS facility would be located adjacent to the proposed MTS facility on the existing ball field at the intersection of Fifth Street East and D Street East. The facility would include a reinforced concrete foundation, concrete floor slab, structural steel frame, and standing seam metal roof and exterior. It would include fire suppression systems, all utilities, pavements, communications, site improvements and associated supporting facilities to provide a complete and useable facility. An adjacent parking lot would be constructed to support the MTS and GBTS facilities. Parking associated with the GBTS facility would include 50 parking spaces (approximately 10,125 ft^2) and be located in the southwest portion of the site (AETC 2019a, AETC 2019b). Four antennae would be located on top of the GBTS and would extend up to a maximum height of 15 feet above the building. The antennae would provide the communication data link to the GBTS facility. The precise site layout plan for the proposed GBTS facility is still being developed and is within the combined MTS and GBTS site shown in **Figure 2-2**. **Figure 2-4** shows a rendition of the proposed GBTS facility and antennae.

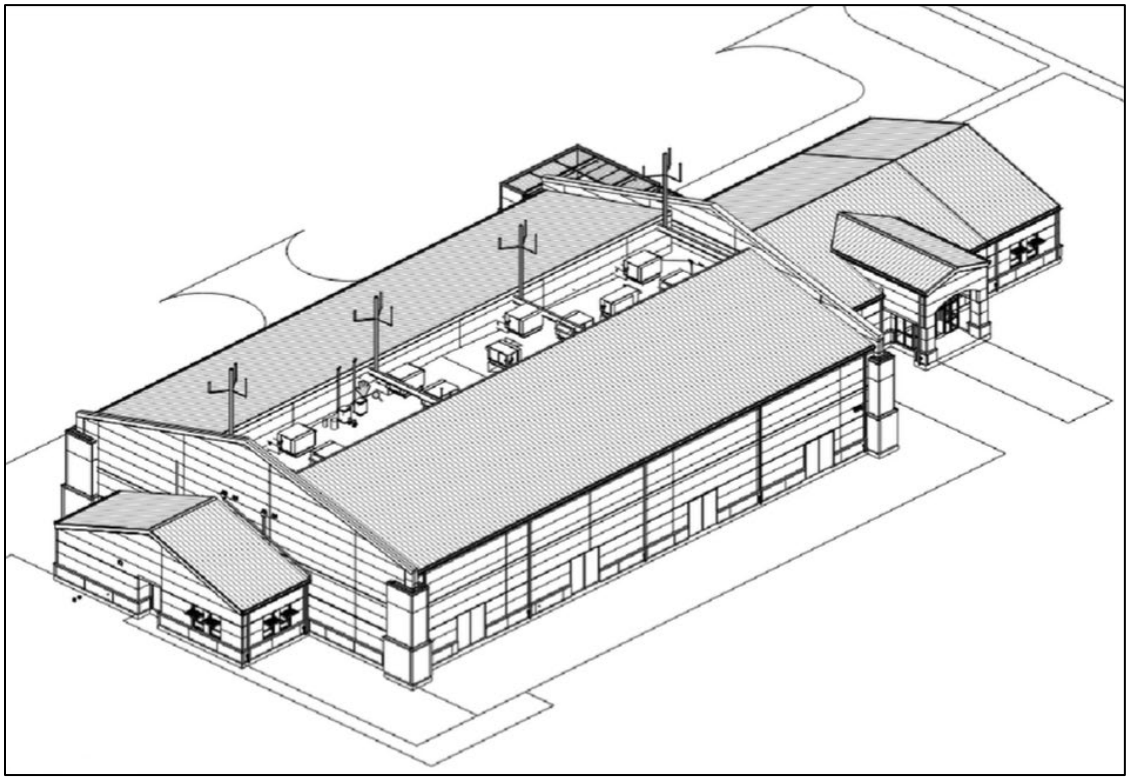
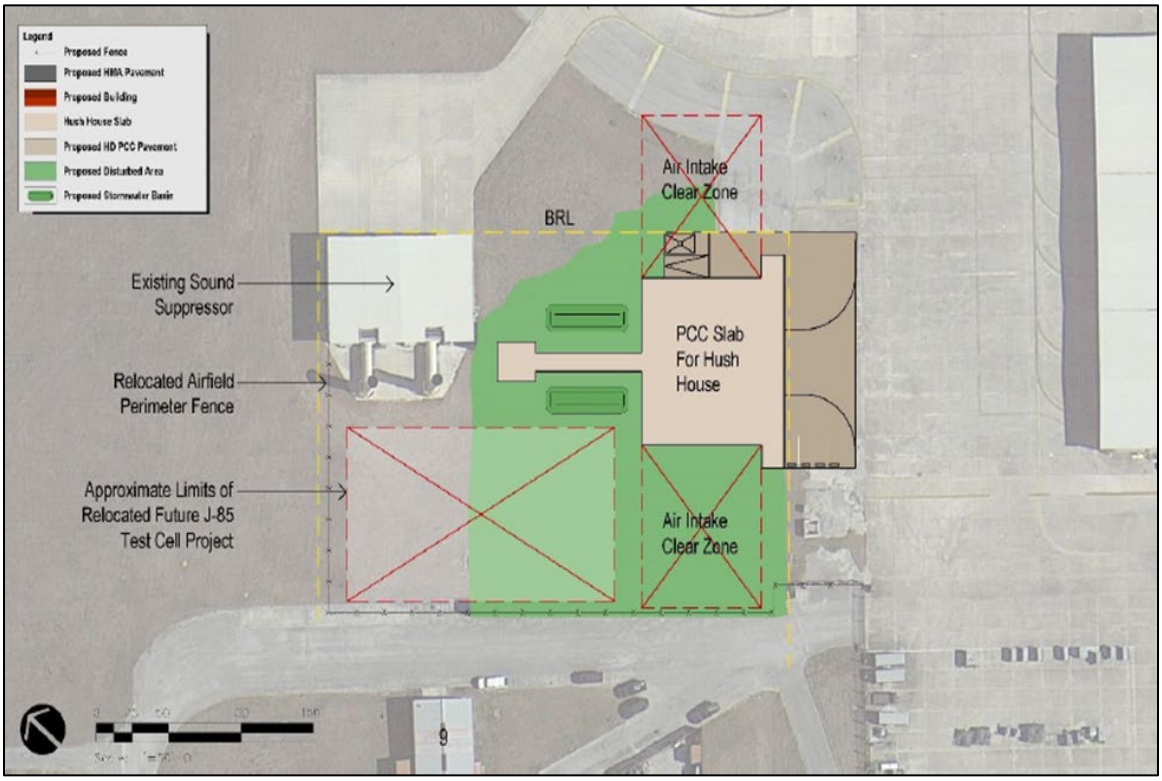


Figure 2-4. Rendition of the Proposed GBTS Facility and Antennae

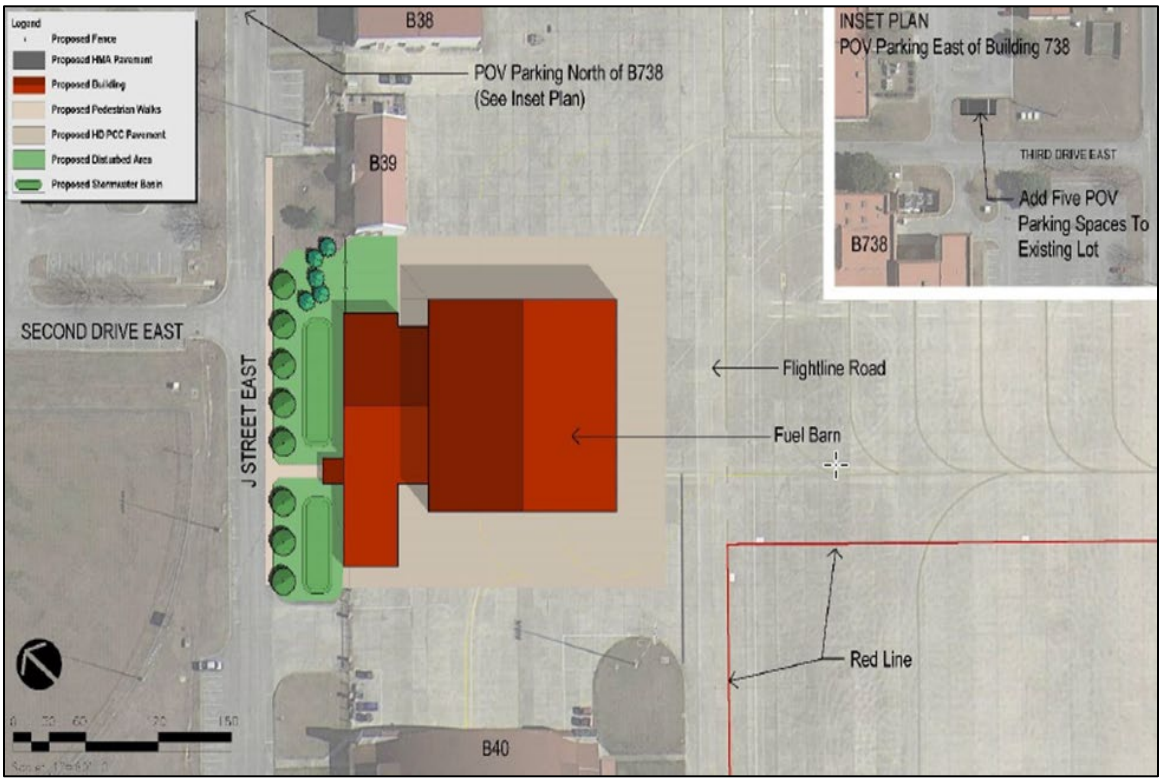
Hush House Pad. A hush house is an enclosed unit that contains noise suppressing and testing equipment to accommodate in-frame or out-of-frame aircraft engine testing. The proposed hush house pad would be constructed on the site of JBSA-Randolph's existing hush house pad on the airfield. It would include a 24,611 ft^2 reinforced, unsuppressed concrete pad with thick edges and paved shoulders for the hush house enclosure. The concrete pad would have an anchor block in the center to perform full-power engine diagnostics testing of the aircraft engine to keep the aircraft stationary. The surface of the unsuppressed power check pad must slope 3.5 percent in all directions from the anchor block to the pavement edge to divert the effect of jet blast away from the concrete surfaces and pavement joints. The pad would provide the appropriate base for the placement of the hush house (AETC 2019a, AETC 2019b). **Figure 2-5** shows the site plan for the proposed hush house pad.



Source: AETC 2019a

Figure 2-5. Hush House Pad Site Plan

Fuel Cell Facility. Construct a 35,138 ft^2 T-7A Fuel Systems Maintenance Dock (i.e., Fuel Cell) facility. The facility would be a two-bay facility to support simultaneous maintenance of four aircraft. The facility would have cast-in-place reinforced footing and foundation walls, split-face concrete masonry unit walls, and a standing seam metal roof, utilizing conventional design and construction methods to accommodate the mission of the facility. It would include space for heating, plumbing, latrines, ventilation, compressed air, and fire detection and suppression. This project would also include mechanical ventilation, fume sensing and alarm, fire-extinguishing systems, and wash down drainage trenches, pavements, communications, site improvements, and associated support facilities to provide a complete and useable facility. Facility support areas would include separate shower/restroom/locker facilities for male and female personnel, a separate dispatch area with ventilation controls, a break/training room, mobility equipment storage, and a separate storage area for tools and equipment. The project would include parking for five vehicles east of Building 738. The proposed facility would be sited to maintain aircraft access to Hangar 40 and avoid Flightline Road and aircraft parking spots (depicted by the red line on **Figure 2-6**) (AETC 2019a, AETC 2019b). **Figure 2-6** shows the site plan for the proposed fuel cell facility.



Source: AETC 2019a

Figure 2-6. Fuel Cell Facility Site Plan

T-7A Shelters. Construct 65 shelters (sunshades) on the existing aircraft parking apron to protect T-7A aircraft from adverse weather. Existing T-38C shelters would be removed, and T-7A shelters would be appropriately spaced to accommodate the planned T-7A parking requirements on a schedule determined to best support the aircraft transition. Taxi lines would be removed and repainted. Electrical utilities, proper lighting, and tie-downs/grounding point

would be installed to each shelter (AETC 2019a, AETC 2019b). The proposed locations for the T-7A shelters are shown on **Figure 2-1**.

Add/Alter T-7A Egress Facility. Add two rooms (total of 3,739 ft^2) to the southwest side of Building 38 for egress maintenance and egress storage rooms. The egress facility is limited in the amount of explosives and detonation cord that can be on hand in the maintenance area and storage. To support the T-7A aircraft, an additional 130 seats and 65 canopies with detonation cord installed will need to be stored and maintained (AETC 2019a, AETC 2019b). The proposed location of the proposed Building 38 addition is shown on **Figure 2-1**.

2.1.4.2 FSRM Projects

Table 2-4 summarizes the 13 FSRM projects that would occur at JBSA-Randolph to support the T-7A recapitalization.

Table 2-4. FSRM Projects

Project Name	Short Project Description
Add/Alter Hangar 63 to support the 99 Flying Training Squadron (FTS)	The first floor of Hangar 63 would be modified to support the 99 FTS (77 personnel, equipment, and furniture) move from Hangar 12.
Relocate T-1 shelters rows 16 to 20 and associated allied support	Relocate T-1 shelters rows 16 to 20 and allied support necessary to install electrical utilities, proper lighting, and tie-downs/grounding point and remove/repaint taxi lines needed to move these shelter rows to make room for T-7A shelters in Phases III and IV.
Add/Alter Hangar 13	Modify Hangar 13 and the lean-to area for the 12 MXG, 12 OG, 12 MX life support personnel, trainers and IOT&E cadre. Modifications to existing structures will be required for 170 personnel. Repainting, new flooring, communication requirements, electrical outlets, etc. and provide mission communication service to Hangar 13 for T-7A.
Add/Alter Building 220	Public Affairs would move from Hangar 6 to Building 220. Modify Building 220 for use as office space. Install proper utilities including electrical service and computer and phone lines.
Add/Alter Hangar 72	Remove blocked door and install two lockable full-length glass doors. Demolish Flight Service Center office complex. Disconnect and render safe all electrical service/water/computer and phone lines. Remove old Security Forces fencing and concertina razor wire. Cut all anchor points to floor level or below. Demolish gun vault, disconnect and render safe all electrical service.
Modify/Reconfigure Hangar 6 to support the expansion of the 435 FTS	Modify Hangar 6 for expansion of 435 FTS. Modifications to existing interior would be required for the new T-7A FTS operations requirements.
Repaint A1 and A6 Hammerhead Taxi Lines	Repaint taxi-lane markings and restripe for T-7A aircraft to new specifications. Re-stripe towlines into maintenance hangars. Re-stripe marked aerospace ground equipment boxes. Re-stripe select aircraft parking areas and add additional tie-downs and grounding points if needed.

Project Name	Short Project Description
Relocate CE Plumbers and HVAC personnel and equipment from Building 2 to Buildings 878 and 891	Move CE Plumbers and HVAC personnel and equipment (16 civilians) from Building 2 to Buildings 878 and 891.
Renovate Hangar 12 for 560 FTS	Renovate Hangar 12 for the 560 FTS expansion for the new T-7A FTS. Modifications to existing structures would be required for the new T-7A FTS operations requirements.
Add/Alter Building 2 as required and relocate J85 engine shop	Add/alter Building 2 as required and relocate J85 engine shop to Hangar 7, including six civilian personnel, engine stands, engine lifts, and other equipment. Hangar 7 already performs J85 engine work and could accommodate the increased mission without renovation.
Reconfigure Hangar 5 as a phase dock and MSU repair facility	Reconfigure Hangar 5 from the J85 engine shop and T-38 Training Facility to the APT (T-7A) dedicated Phase Dock and MSU Repair Facility. Remove J85 engine shop and fencing. Reconfigure Hangar 5 to include new hangar space markings, towlines in and out of the hangar, electrical, air, tool room, and office space for T-7A personnel.
Construct munition storage facility	A new munitions storage building would be added to the JBSA-Randolph ammunition storage area. An 1,855 ft^2 magazine is required to store Aces 5 ejection seats for the new T-7A aircraft. Given the explosive safety hazard of the ejection seats, this facility would be sited within JBSA-Randolph's existing explosive safety quantity-distance (Q-D) arc, which prescribes the allowable distance to other buildings.
Trim Pad/Compass Rose	Utilize the existing Trim Pad to install the T-7A anchor. Relocate the Compass Rose to another magnetically quiet site. The South Ramp is the proposed location for the relocation of the Compass Rose; however, all tie-downs, grounding points, and other metal within the red circle would require removal.

Sources: AETC 2019a, AETC 2019b

2.2 Alternatives including the Proposed Action

Considering alternatives helps to avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve the stated purpose. CEQ requires use of the NEPA process to identify and assess reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment. CEQ NEPA guidance identifies reasonable alternatives as those that are economically and technically practical or feasible and that show evidence of common sense (CEQ 1986).

As discussed in **Section 1.2**, the Secretary of the Air Force identified JBSA-Randolph as the Preferred Alternative for the initial recapitalization efforts to replace the T-38C with the T-7A. The Proposed Action and Alternatives identified and evaluated within this EIS focus on the JBSA-Randolph recapitalization effort.

DAF considered several alternatives for implementing T-7A recapitalization at JBSA-Randolph. The alternatives included fewer T-7A aircraft stationed at JBSA-Randolph; lesser and greater intensities of T-7A operations at JBSA-Randolph, JBSA-Lackland, and Seguin AAF; and different designs and locations for the MILCON projects at JBSA-Randolph as compared to the Proposed Action alternative. Each alternative was evaluated against selection standards to determine reasonability. Reasonable alternatives were carried forward for analysis in this EIS,

while unreasonable alternatives were dismissed from further analysis. **Section 2.2.1** describes and evaluates the alternatives for number of aircraft and aircraft operations, and **Section 2.2.2** describes and evaluates the alternatives for the MILCON projects as compared to the Proposed Action alternative. No alternatives were developed for the FSRM projects given their limited scope. Each alternative would result in an identical staffing increase as the Proposed Action.

2.2.1 Aircraft and Aircraft Operations Alternatives

The proposed T-7A recapitalization must allow AETC, the 502d Air Base Wing, and the 12th Flying Training Wing to maintain the ability to operate and train without affecting the mission. The selection standards were developed and used to screen T-7A recapitalization alternatives for the Proposed Action, described in **Section 2.1**.

2.2.1.1 Selection Standards

The selection of JBSA-Randolph as the preferred alternative for initial T-7A recapitalization was based on criteria that included mission factors (weather and the ability to meet syllabus requirements), infrastructure capacity (operational facilities, runways and base support), as well as potential environmental constraints and costs.

With a focus on implementing the recapitalization action at JBSA-Randolph, alternatives for T-7A aircraft operations have been evaluated against the following selection standards determined as necessary to execute the T-7A mission at this location:

1. An alternative must not result in major operational constraints to existing missions. Operational constraints would occur if a currently ongoing operation, activity, or mission were limited by proposed activities.
2. An alternative must be adaptable and compatible with current infrastructure capabilities, including roadways and utilities.
3. An alternative must be scalable in terms of aircraft operations to accommodate the projections of ongoing adaptive management measures.
4. An alternative should consider the need for new construction and land disturbance versus renovation or reuse of existing facilities.

2.2.1.2 Alternatives

Subsequent to the Secretary of Air Force Strategic Basing decision and the results of internal and external scoping, DAF is considering the alternatives of the No Action, Proposed Action and three reasonable action alternatives. The following paragraphs describe these three alternatives as compared to the Proposed Action.

Alternative 1: Conduct T-7A Operations at a Lower Intensity than the Proposed Action with Fewer Aircraft to Comply with Clean Air Act (CAA) General Conformity Rule Requirements.[5] Alternative 1 entails scaling back the Proposed Action's T-7A flight operations to keep the annual net change in emissions below the 100 tpy GCR *de minimis* values for NOx. After the public scoping period ended and initial impact analysis began, DAF determined that

[5] Modifications to the aircraft operations (power settings and afterburner usage) for Alternative 1 are discussed in **Section 3.1** as a mitigation measure.

emissions of an ozone (O_3) precursor from operations of the T-7A aircraft at the intensity of the Proposed Action would exceed the 100 tons per year (tpy) allowable limit for nitrogen oxides (NOx) in the Bexar County O_3 nonattainment area in 2027 and later. To remedy this situation, DAF calculated the allowable number of T-7A aircraft and aircraft operations that would result in emissions less than the prescribed limit and allow the recapitalization efforts to be implemented at JBSA-Randolph. The number of aircraft and intensity of operations under this alternative, if selected, would be adequate to meet training and basing requirements until 2026. This timeframe allows for the transition of aircraft to begin at JBSA-Randolph and conduct training operations with O_3 percursor emissions (i.e., NOx) below the 100 tpy limit within Bexar County. This timeline also aligns with planned re-evaluation of air quality in Bexar County for attainment/nonattainment categorization. In **Section 3**, discussion of mitigation and adaptive management strategies are addressed as concurrent actions that may occur and further analyzed to define the allowable level of future T-7A operations beyond 2026. Training and basing requirements would need to be reassessed consistent with the GCR requirements, as identified in 42 United States Code (USC) § 7606 (c) [CAA § 176(c)], that are applicable to Bexar County at the time of reassessment, if required. These additional concurrent actions are discussed as adaptive management measures and further defined in **Section 3**.

Under Alternative 1, JBSA-Randolph would receive up to 56 T-7A aircraft, with all aircraft arriving no later than 2028. T-7A operations would reach the current maximum allowable number of operations in 2028 based on projected emissions and the current limit for O_3 precursors noted above. T-38C operations would conclude in 2027. In addition to the proposed daytime flight operations, up to 4,065 annual nighttime T-7A operations would be performed at JBSA-Randolph and up to 225 annual nighttime T-7A operations would be performed at JBSA-Lackland. The conversion from T-38C to T-7A aircraft and the annual aircraft operations for JBSA-Randolph, JBSA-Lackland, and Seguin AAF under Alternative 1 are defined in **Table 2-5**.

Alternative 2: Perform T-7A Operations at an Intensity 15 Percent Greater than the Proposed Action.[6] Like the Proposed Action, JBSA-Randolph would receive 72 T-7A aircraft, with all aircraft arriving no later than 2028; T-7A operations would reach full capacity in 2032; and T-38C operations would conclude in 2031. However, under Alternative 2, beginning in 2024, T-7A aircraft would perform annual operations at JBSA-Randolph, JBSA-Lackland, and Seguin AAF at an intensity that is approximately 15 percent greater than the Proposed Action. Alternative 2 is intended to cover a potential scenario in which, for either broad strategic or tactical operational reasons, DAF requires a surge or increase in pilot training operations above the program implementing plan and is represented by the 15 percent increase. T-7A nighttime operations would occur with up to 6,569 nighttime operations at JBSA-Randolph and up to 331 nighttime operations at JBSA-Lackland. The conversion from T-38C to T-7A aircraft and the annual aircraft operations for JBSA-Randolph, JBSA-Lackland, and Seguin AAF under Alternative 2 are defined in **Table 2-6**.

[6] Modifications to the aircraft operations (power settings and afterburner usage) for Alternative 2 are discussed in **Section 3.1** as a mitigation measure.

Table 2-5. Cumulative Number of Aircraft and Operations under Alternative 1

Aircraft	2017 Baseline	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032 and Later
Number of Aircraft Stationed at JBSA-Randolph											
T-38C	91	97	96	85	78	62	0	0	0	0	0
T-7A	0	8	18	25	39	52	56	56	56	56	56
Total	91	105	114	110	117	114	56	56	56	56	56
Operations at JBSA-Randolph											
Annual Aircraft Operations (Daytime)											
T-38C	97,000	131,100	131,100	113,333	103,517	79,406	0	0	0	0	0
T-7A	0	4,538	13,170	29,592	45,642	70,216	76,257	76,257	76,257	76,257	76,257
Total	97,000	135,638	144,270	142,925	149,159	149,622	76,257	76,257	76,257	76,257	76,257
Annual Aircraft Operations (Nighttime)											
T-7A	0	320	184	1,912	3,072	3,630	4,065	4,065	4,065	4,065	4,065
Operations at JBSA-Lackland											
Annual Aircraft Operations (Daytime)											
T-38C	400	400	390	320	280	200	0	0	0	0	0
T-7A	0	40	64	296	480	600	675	675	675	675	675
Total	400	440	454	616	760	800	675	675	675	675	675
Annual Aircraft Operations (Nighttime)											
T-7A	0	20	16	96	160	200	225	225	225	225	225
Operations at Seguin AAF											
Annual Aircraft Operations (Daytime)											
T-38C	42,000	57,400	56,700	46,100	39,800	28,700	0	0	0	0	0
T-7A	0	645	2,880	13,200	21,200	30,320	32,562	32,562	32,562	32,562	32,562
Total	42,000	58,045	59,580	59,300	61,000	59,020	32,562	32,562	32,562	32,562	32,562
Operations within Training Airspace (MOAs, Ranges, MTRs)											
Annual Aircraft Operations within the Training Airspace											
T-38C	13,641	18,436	18,436	15,937	14,557	11,166	0	0	0	0	0
T-7A	0	683	1,878	4,430	6,850	10,385	11,295	11,295	11,295	11,295	11,295
Total	13,641	19,119	20,314	20,368	21,407	21,551	11,295	11,295	11,295	11,295	11,295
Annual T-7A Aircraft Operations Below 3,000 feet AGL within the Training Airspace											
T-7A	0	276	758	1,787	2,763	4,188	4,555	4,555	4,555	4,555	4,555

Sources: LPES 2021, AFCEC/CZTQ 2021

Table 2-6. Cumulative Number of Aircraft and Operations under Alternative 2

Aircraft	2017 Baseline	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032 and Later
Number of Aircraft Stationed at JBSA-Randolph											
T-38C	91	97	96	85	78	62	41	34	29	15	0
T-7A	0	8	18	25	39	58	72	72	72	72	72
Total	91	105	114	110	117	120	113	106	101	87	72
Operations at JBSA-Randolph											
Annual Aircraft Operations (Daytime)											
T-38C	97,000	131,100	131,100	113,333	103,517	79,406	55,936	46,691	35,718	18,845	0
T-7A	0	4,538	15,146	34,030	52,488	87,158	117,500	120,991	122,966	122,202	131,344
Total	97,000	135,638	146,246	147,363	156,005	166,564	173,436	167,682	158,684	141,047	131,344
Annual Aircraft Operations (Nighttime)											
T-7A	0	320	212	2,199	3,533	5,060	6,348	6,569	6,514	6,514	6,514
Operations at JBSA-Lackland											
Annual Aircraft Operations (Daytime)											
T-38C	400	400	390	320	280	200	150	120	80	0	0
T-7A	0	40	74	340	552	782	911	994	1,021	1,030	1,067
Total	400	440	464	660	832	982	1,061	1,114	1,101	1,030	1,067
Annual Aircraft Operations (Nighttime)											
T-7A	0	20	18	110	184	258	294	322	331	331	331
Operations at Seguin AAF											
Annual Aircraft Operations (Daytime)											
T-38C	42,000	57,400	56,700	46,100	39,800	28,700	21,100	16,700	10,800	2,680	0
T-7A	0	645	3,312	15,180	24,380	34,868	40,572	44,344	45,356	45,908	47,380
Total	42,000	58,045	60,012	61,280	64,180	63,568	61,672	61,044	56,156	48,588	47,380
Operations within Training Airspace (MOAs, Ranges, MTRs)											
Annual Aircraft Operations within the Training Airspace											
T-38C	13,641	18,436	18,436	15,937	14,557	11,166	7,866	6,566	5,023	2,650	0
T-7A	0	2,160	5,095	7,878	12,968	17,415	17,938	18,208	18,101	19,386	19,386
Total	13,641	20,596	23,531	23,815	27,525	28,582	25,804	24,774	23,124	22,036	19,386
Annual T-7A Aircraft Operations Below 3,000 feet AGL within the Training Airspace											
T-7A	0	237	749	1,766	2,730	4,494	6,035	6,216	6,310	6,347	6,792

Source: LPES 2021

Table 2-7. Cumulative Number of Aircraft and Operations under Alternative 3

Aircraft	2017 Baseline	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032 and Later
Number of Aircraft Stationed at JBSA-Randolph											
T-38C	91	97	96	85	78	62	41	34	29	15	0
T-7A	0	8	18	25	39	58	72	72	72	72	72
Total	91	105	114	110	117	120	113	106	101	87	72
Operations at JBSA-Randolph											
Annual Aircraft Operations (Daytime)											
T-38C	97,000	131,100	131,100	113,333	103,517	79,406	55,936	46,691	35,718	18,845	0
T-7A	0	4,538	16,463	36,989	57,052	94,737	127,717	131,511	133,658	132,828	142,765
Total	97,000	135,638	147,563	150,322	160,569	174,143	183,653	178,202	169,376	151,673	142,765
Annual Aircraft Operations (Nighttime)											
T-7A	0	320	230	2,390	3,840	5,500	6,900	7,140	7,080	7,080	7,080
Operations at JBSA-Lackland											
Annual Aircraft Operations (Daytime)											
T-38C	400	400	390	320	280	200	150	120	80	0	0
T-7A	0	40	80	370	600	850	990	1,080	1,110	1,120	1,160
Total	400	440	470	690	880	1,050	1,140	1,200	1,190	1,120	1,160
Annual Aircraft Operations (Nighttime)											
T-7A	0	20	20	120	200	280	320	350	360	360	360
Operations at Seguin AAF											
Annual Aircraft Operations (Daytime)											
T-38C	42,000	57,400	56,700	46,100	39,800	28,700	21,100	16,700	10,800	2,680	0
T-7A	0	645	3,600	16,500	26,500	37,900	44,100	48,200	49,300	49,900	51,500
Total	42,000	58,045	60,300	62,600	66,300	66,600	65,200	64,900	60,100	52,580	51,500
Operations with Airspace Training Areas (MOAs, Ranges, MTRs)											
Annual Aircraft Operations within the Training Airspace											
T-38C	13,641	18,436	18,436	15,937	14,557	11,166	7,866	6,566	5,023	2,650	0
T-7A	0	683	2,347	5,538	8,563	14,096	18,931	19,498	19,791	19,675	21,072
Total	13,641	19,119	20,783	21,475	23,120	25,262	26,797	26,064	24,814	22,325	21,072
Annual T-7A Aircraft Operations Below 3,000 feet AGL within the Training Airspace											
T-7A	0	237	814	1,919	2,967	4,884	6,559	6,756	6,858	6,898	7,382

Source: LPES 2021

Table 2-5 Notes:

1. Nighttime operations would only occur at JBSA-Randolph and JBSA-Lackland and only involve T-7A aircraft.
2. The number of T-7A and associated operations for 2027 and beyond represent the minimum number of annual operations based on currently best available information and limited by 100 tpy of O_3 precursors. Use of adaptive management techniques discussed in Section 3 may result in increased numbers and additional future evaluation.
3. Operations for Airspace Training are a total number of aircraft operations. The various MOAs and MTRs will experience varying levels of operations within the total number of operations shown.

Table 2-6 Notes:

1. Nighttime operations would only occur at JBSA-Randolph and JBSA-Lackland and only involve T-7A aircraft
2. Operations for Airspace Training are a total number of aircraft operations. The various MOAs and MTRs will experience varying levels of operations within the total number of operations shown.

Table 2-7 Notes:

1. Nighttime operations would only occur at JBSA-Randolph and JBSA-Lackland and only involve T-7A aircraft.
2. Operations for Airspace Training are a total number of aircraft operations. The various MOAs and MTRs will experience varying levels of operations within the total number of operations shown.

Alternative 3: Perform T-7A Operations at an Intensity 25 Percent Greater than the Proposed Action.[7] Like the Proposed Action, JBSA-Randolph would receive 72 T-7A aircraft with all aircraft arriving no later than 2028; T-7A operations would reach full capacity in 2032; and T-38C operations would conclude in 2031. However, Alternative 3 would further increase the surge or increase of T-7A operations to approximately 25 percent above the Proposed Action beginning in 2024. T-7A nighttime operations would occur with up to 7,140 nighttime operations at JBSA-Randolph and 360 nighttime operations at JBSA-Lackland. The conversion from T-38C to T-7A aircraft and the annual aircraft operations for JBSA-Randolph, JBSA-Lackland, and Seguin AAF under Alternative 3 are defined in **Table 2-7.**

For each of the three alternatives, the T-7A would perform the same types of operations within the training region of JBSA-Randolph, JBSA-Lackland, and Seguin AAF, as described for the Proposed Action. The T-7A recapitalization would continue all normal T-38C and T-7A training operations on the east runway, and normal airfield hours of operation would remain 7 a.m. to 7 p.m., Monday through Friday, and 1 p.m. to 4 p.m. on Sunday. The airfield would remain closed on Saturdays and federal holidays. In general, the east runway can accommodate up to one takeoff or landing every 3 minutes, which is sufficient to support the proposed T-38C and T-7A operations for the Proposed Action and all alternatives.

Table 2-8 summarizes the evaluation of the three alternatives against the selection standards. Each of the three alternatives meets all the selection standards; therefore, all are carried forward for analysis in this EIS.

Table 2-8. Evaluation of Alternatives

Alternative	Selection Standard			
	1	2	3	4
Proposed Action: Conduct T-38C and T-7A operations at projected levels[1] + T-7A nighttime operations	✓	✓	✓	✓
Alternative 1: Conduct T-38C and T-7A operations at lower projected levels[2] + T-7A nighttime operations with fewer delivered T-7A aircraft to comply with Clean Air Act GCR requirements	✓	✓	✓	✓
Alternative 2: Conduct T-38C and T-7A operations at 15 percent greater than the Proposed Action projected levels[3] + increased T-7A nighttime operations	✓	✓	✓	✓
Alternative 3: Conduct T-38C and T-7A operations at 25 percent greater than the Proposed Action projected levels[4] + increased T-7A nighttime operations	✓	✓	✓	✓

Note: "Projected Level" means the level of T-7A operations required to produce sufficient qualified pilots

Key: [1] = Projected levels of T-38C and T-7A operations for the Proposed Action are shown in **Table 2-1**.
[2] = Projected levels of T-38C and T-7A operations for Alternative 1 are shown in **Table 2-5**.
[3] = Projected levels of T-38C and T-7A operations for Alternative 2 are shown in **Table 2-6**.
[4] = Projected levels of T-38C and T-7A operations for Alternative 3 are shown in **Table 2-7**.

[7] Modifications to the aircraft operations (power settings and afterburner usage) for the Alternative 3 are discussed in **Section 3.1** as a mitigation measure.

2.2.2 Facility Requirements Alternatives

2.2.2.1 Selection Standards

The Proposed Action includes the six MILCON projects described in **Section 2.1.4.1**. Alternatives have been considered for five of the six MILCON projects and evaluated against the following selection standards:

1. An alternative must not result in operational constraints. Operational constraints would occur if a currently ongoing operation, activity, or mission were limited by proposed facility construction or renovation activities.
2. The facility construction must agree with installation land use patterns and be compatible with surrounding uses. Facilities requiring flightline access must be sited accordingly. The facility construction or renovation must provide an efficient solution to support the intended use.
3. The action must accommodate the updated capabilities of the T-7A aircraft and the associated changes in parameters of PIT and IFF training operations.
4. New facility construction must have minimal environmental impact with no effect on existing wetlands or floodplains.

2.2.2.2 Alternatives

The facility requirements alternatives and evaluation are as follows:

MTS Facility. One alternative was considered for the MTS facility. The alternative would convert Hangar 13 to an aircraft MTS facility. Conversion would require renovation of 30,000 ft^2 of hangar space for repairs or modifications to fire suppression, electrical, heating and air conditioning systems, interior partitions, floor, ceiling, and interior finishes to provide a complete and useable facility. Because this alternative would interrupt and relocate existing activities at Hangar 13, it fails to satisfy Selection Standard 1 requiring avoidance of operational constraints. Therefore, this alternative has been dismissed from further analysis in this EIS.

***GBTS Facility*.** Two alternatives were considered for the GBTS facility. The first alternative would convert Building 745 to a GBTS facility. Conversion would require renovation of 32,490 ft^2 of interior space for addition or alteration of the fire suppression systems, utilities, pavements, communications, site improvements, and associated supporting facilities to provide a complete and useable facility. This alternative would displace 90 personnel from the Air Force Audit Agency. Therefore, this alternative fails to meet Selection Standards 1 and 2 because it is not an operationally efficient solution and displaces a current function. Therefore, this alternative has been dismissed from further analysis in this EIS.

The second alternative only would occur if aircraft operations Alternative 1 (see **Section 2.2.1.2**) is selected. Under this alternative, the GBTS facility would be sited identically as the Proposed Action but designed with six large bays rather than eight. Fewer bays would be sufficient under Alternative 1 given the reduced number of aircraft and aircraft operations as compared to the Proposed Action. The building size and footprint would remain the same as the Proposed Action, and the additional building space would be used as administrative areas and office

space. This alternative meets all the selection standards and is carried forward for analysis in this EIS as part of Alternative 1.

Hush House. No alternatives were considered for the hush house pad. The hush house requires airfield access to allow for in-frame testing of the engines. JBSA-Randolph's existing hush house for T-38 aircraft is located within the airfield; however, it would not accommodate the T-7A aircraft. Under the Proposed Action, the T-7A hush house would be located on the site of the existing T-38 hush house. This location has proven to be a good locale for access and for minimizing noise from hush house engine run-ups to neighboring areas. Locating the hush house in a different part of the airfield would likely require new airfield traffic patterns, maintenance procedures, and potentially varying controls such as hours of operations to ensure noise is properly contained. As such, there are no alternative locations for the hush house that meet Selection Standard 1, and no alternatives were carried forward for analysis in this EIS.

Fuel Cell. One alternative was considered for the fuel cell facility. The alternative would convert Hangar 13 into the fuel cell facility. Conversion would require renovation to approximately 29,125 ft^2 of interior space in Hangar 13 and construction of a 16,300 ft^2 addition onto the building. Renovation would entail demolition of interior walls, alteration of the electrical system, alteration of the heating and ventilation system, addition of a fire suppression system, and replacing interior finishes to provide a complete and useable facility. This alternative fails to meet Selection Standard 2 because it does not provide an efficient solution to conduct fuel cell activities. Therefore, this alternative has been dismissed from further analysis in this EIS.

T-7A Shelters. One alternative was considered for the T-7A shelters. This alternative only would occur if aircraft operation Alternative 1 (see **Section 2.2.1.2**) is selected for implementation. Under this alternative, 52 T-7A shelters would be installed rather than 65 under the Proposed Action. Fewer shelters would be sufficient under Alternative 1 given the reduced number of aircraft compared to the Proposed Action. This alternative meets all the selection standards and is carried forward for analysis in this EIS as part of Alternative 1.

T-7A Egress Facility. One alternative was considered for the addition and alteration of Building 38 to accommodate egress maintenance and egress storage rooms. This alternative would only occur if aircraft operations Alternative 1 (see **Section 2.2.1.2**) is selected for implementation. Under this alternative, the planned addition of 3,739 ft^2 to Building 38 would be reduced proportionately to support maintenance and storage of 104 T-7A seats and 52 T-7A canopies. The small addition would be sufficient under Alternative 1 given the reduced number of aircraft compared to the Proposed Action. This alternative meets all the selection standards and is carried forward for analysis in this EIS as part of Alternative 1.

2.2.3 Alternatives Carried Forward for Analysis

Aircraft and aircraft operations Alternatives 1, 2, and 3 satisfy the purpose of and need for the Proposed Action and meet all the selection standards listed in **Section 2.2.1.1**. Therefore, these three alternatives have been carried forward for analysis in this EIS.

For facility requirements alternatives, only the second alternative for the GBTS facility, the alternative for the T-7A shelters, and the alternative for a smaller T-7A egress facility meet all the selection standards identified in **Section 2.2.2.1**. These three alternatives only would occur

if aircraft and aircraft operations Alternative 1 is selected. Therefore, these three facility requirements alternatives have been carried forward for analysis in this EIS as part of the aircraft and aircraft operations Alternative 1.

2.3 No Action Alternative

CEQ and DAF NEPA regulations require consideration of the No Action Alternative to assess any environmental consequences that may occur if the Proposed Action is not implemented. The T-7A program will be implemented whether or not the No Action Alternative is selected. If the No Action Alternative was selected due to unresolvable issues, DAF would re-evaluate their T-7A strategic basing decision and implement all or a portion of the basing requirements proposed for JBSA-Randolph at an undetermined location. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be evaluated.

Under the No Action Alternative, DAF would not implement T-7A recapitalization at JBSA. As a result, DAF's T-7A recapitalization program would not be initiated and T-7A aircraft would not be flown for pilot training in place of the T-38C. The manufacturing of the T-7A aircraft has been contracted; therefore, the disposition of the T-7A aircraft would be determined separately if the No Action Alternative were implemented. The installation's existing fleet of T-38C aircraft would continue to be used in their current capacity even though they will reach the end of their service lives within the next decade. Maintenance requirements for these aircraft would continue to increase. No changes to current flight operations would likely occur until the end of the T-38C's service life. The retention and continued use of the T-38C aircraft would impose no change on the number of personnel on JBSA-Randolph. The number and types of T-38C aircraft operations would remain the same, consistent with the current training curriculum and as operations are shown in the 2017 JBSA-Randolph Air Installations Compatible Use Zones Study. The airspace (MOAs, MTRs, and Ranges) for T-38C operations would continue to be used at the same tempo and in a similar manner. No MILCON or FSRM projects would be undertaken to support the T-7A program at JBSA-Randolph. Selection of the No Action Alternative would not be sustainable and would fail to train pilots to transition to fourth and fifth generation aircraft. The No Action Alternative does not meet the purpose of and need for the action, as described in **Section 1.4**, but will be carried forward for analysis as required by law.

2.4 Identification of the Preferred Alternative

As noted in **Section 1**, the Secretary of the Air Force selected JBSA-Randolph as the preferred alternative as the initial location for T-7A aircraft in the Strategic Basing Memorandum dated February 16, 2018.

DAF has identified the Proposed Action for this EIS addressing recapitalization at JBSA-Randolph as its Preferred Alternative for NEPA purposes.

2.5 Environmental Consequences of Alternatives

A summary of the environmental impacts associated with each alternative is provided in **Table 2-9**.

Table 2-9. Summary of Environmental Impacts

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Air Quality				
No impacts would occur.	Short-term, minor and long-term, significant adverse effects would occur. The short-term (2022 to 2026) effects would be from fugitive dust and the use of heavy equipment during construction. Long-term effects would be from additional personnel, heated interior space, and aircraft flight operations. Air emissions would exceed the GCR *de minimis* value for oxides of nitrogen (NO_X) in the Bexar County nonattainment area beginning in 2027.	Short-term, minor and long-term, moderate (less than significant) adverse effects would occur. The short-term (2022 to 2026) effects would be from fugitive dust and the use of heavy equipment during construction. Long-term effects would be from additional personnel, heated interior space, and aircraft flight operations. Air emissions would not exceed the GCR *de minimis* value for NO_X in the Bexar County.	Short-term, minor and long-term, significant adverse effects would occur. The short-term (2022 to 2026) effects would be from fugitive dust and the use of heavy equipment during construction. Long-term effects would be from additional personnel, heated interior space, and aircraft flight operations. Air emissions would exceed the GCR *de minimis* value for NO_X in the Bexar County nonattainment area beginning in 2027.	Short-term, minor and long-term, significant adverse effects would occur. The short-term (2022 to 2026) effects would be from fugitive dust and the use of heavy equipment during construction. Long-term effects would be from additional personnel, heated interior space, and aircraft flight operations. Air emissions would exceed the GCR *de minimis* value for NO_X in the Bexar County nonattainment area beginning in 2027.
Noise				
No impacts would occur.	Short-term, minor and long-term, significant, adverse effects on the noise environment would occur. Short-term effects would be due to noise generated by heavy equipment during construction and demolition. Long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training and maintenance operations at JBSA-Randolph and	Short-term, minor and long-term, significant, adverse effects on the noise environment would occur. Short-term effects would be due to noise generated by heavy equipment during construction and demolition. Long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training and maintenance operations at JBSA-Randolph and	Short-term, minor and long-term, significant, adverse effects on the noise environment would occur. Short-term effects would be due to noise generated by heavy equipment during construction and demolition. Long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training and maintenance operations at JBSA-Randolph and	Short-term, minor and long-term, significant, adverse effects on the noise environment would occur. Short-term effects would be due to noise generated by heavy equipment during construction and demolition. Long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training and maintenance operations at

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
	Seguin AAF, and the introduction of operations between 10 p.m. and 7 a.m. Long-term changes in operational noise would substantially increase areas of incompatible land use on and adjacent to JBSA-Randolph and Seguin AAF. Land acreage within noise levels 65-A-weighted decibels (dBA) day-night average sound level (DNL) or greater would increase from 5,148 to 48,861 acres at JBSA-Randolph and from 2,826 acres to 11,960 acres for Seguin AAF. Estimated population within noise levels 65-A weighted dBA would increase from 5,936 to 61,930 people at JBSA-Randolph and from 587 to 2,862 people at Seguin AAF.	Seguin AAF, and the introduction of operations between 10 p.m. and 7 a.m. Compared to the Proposed Action, noise impacts would be slightly less intense (but still significant) due to the lower number of aircraft operations. Land acreage within noise levels 65-dBA DNL or greater would increase from 5,148 to 32,877 at JBSA-Randolph and from 2,826 to 7,800 acres at Seguin AAF. Estimated population within noise levels 65-A weighted dBA would increase from 5,936 to 9,768 people at JBSA-Randolph and from 587 to 2,229 people at Seguin AAF.	Seguin AAF, and the introduction of operations between 10 p.m. and 7 a.m. Compared to the Proposed Action, noise impacts would be slightly greater due to the greater number of aircraft operations. Land acreage within noise levels 65-dBA DNL or greater would increase from 5,148 to 51,775 at JBSA-Randolph and from 2,826 to 12,938 acres at Seguin AAF. Estimated population within noise levels 65-A weighted dBA would increase from 5,936 to 64,788 people at JBSA-Randolph and from 587 to 3,261 people at Seguin AAF.	JBSA-Randolph and Seguin AAF, and the introduction of operations between 10 p.m. and 7 a.m. Compared to the Proposed Action, noise impacts would be slightly greater due to the greater number of aircraft operations. Land acreage within noise levels 65-dBA DNL or greater would increase from 5,148 to 58,056 at JBSA-Randolph and from 2,826 to 13,481 acres at Seguin AAF. Estimated population within noise levels 65-A weighted dBA would increase from 5,936 to 66,637 people at JBSA-Randolph and from 587 to 3,329 people at Seguin AAF.

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Biological Resources				
No impacts would occur.	Short- and long-term, negligible, adverse impacts on vegetation and wildlife at JBSA-Randolph would occur from the MILCON and FSRM projects. Long-term, minor, adverse impacts on wildlife may occur from increased and nighttime aircraft operations. Additional aircraft operations would increase the risk of bird and bat strikes. The Proposed Action would have no effect on all 44 of the federally listed species on JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas.	Short- and long-term, negligible, adverse impacts on vegetation and wildlife at JBSA-Randolph would occur from the MILCON and FSRM projects. Long-term, minor, adverse impacts on wildlife may occur from increased and nighttime aircraft operations; however, these impacts would be slightly less than those described for the Proposed Action. Additional aircraft operations would increase the risk of bird and bat strikes. Alternative 1 would have no effect on all 44 of the federally listed species on JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas.	Short- and long-term, negligible, adverse impacts on vegetation and wildlife at JBSA-Randolph would occur from the MILCON and FSRM projects. Long-term, minor, adverse impacts on wildlife may occur from increased and nighttime aircraft operations. These impacts would be slightly greater than those described for the Proposed Action. Additional aircraft operations would increase the risk of bird and bat strikes. Alternative 2 would have no effect on all 44 of the federally listed species on JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas.	Short- and long-term, negligible, adverse impacts on vegetation and wildlife at JBSA-Randolph would occur from the MILCON and FSRM projects. Long-term, minor, adverse impacts on wildlife may occur from increased and nighttime aircraft operations. These impacts would be slightly greater than those described for the Proposed Action. Additional aircraft operations would increase the risk of bird and bat strikes. Alternative 3 would have no effect on all 44 of the federally listed species on JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas.
Cultural Resources				
No impacts would occur.	The only aspects of the Proposed Action with potential to effect historic properties are the MILCON and FSRM projects proposed for JBSA-Randolph. The Texas State Historic Preservation Officer (SHPO) reviewed the project plans and concurred that no adverse effect would occur.	Impacts from the MILCON and FSRM projects proposed for JBSA-Randolph would be identical to the Proposed Action. The Texas SHPO reviewed the project plans and concurred that no adverse effect would occur.	Impacts from the MILCON and FSRM projects proposed for JBSA-Randolph would be identical to the Proposed Action. The Texas SHPO reviewed the project plans and concurred that no adverse effect would occur.	Impacts from the MILCON and FSRM projects proposed for JBSA-Randolph would be identical to the Proposed Action. The Texas SHPO reviewed the project plans and concurred that no adverse effect would occur.

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Land Use				
No impacts would occur.	The MILCON and FSRM projects at JBSA-Randolph would be largely compatible and consistent with applicable land use plans and regulations. The Proposed Action would meet FAA regulations specific to minimum altitude and avoidance distances. The Clear Zones (CZs) and Accident Potential Zones (APZs) for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged. T-7A aircraft feature substantially louder operating characteristics in comparison with T-38C aircraft. Land areas within the 65 and higher dBA DNL contour are discussed within the noise resources section.	The MILCON and FSRM projects at JBSA-Randolph would be largely compatible and consistent with applicable land use plans and regulations. Alternative 1 would meet FAA regulations specific to minimum altitude and avoidance distances. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged. T-7A aircraft feature substantially louder operating characteristics in comparison with T-38C aircraft. Land area within the 65 and higher dBA DNL contour are discussed within the noise resources section.	The MILCON and FSRM projects at JBSA-Randolph would be largely compatible and consistent with applicable land use plans and regulations. Alternative 2 would meet FAA regulations specific to minimum altitude and avoidance distances. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged. T-7A aircraft feature substantially louder operating characteristics in comparison with T-38C aircraft. Land area within the 65 and higher dBA DNL contour are discussed within the noise resources section.	The MILCON and FSRM projects at JBSA-Randolph would be largely compatible and consistent with applicable land use plans and regulations. Alternative 3 would meet FAA regulations specific to minimum altitude and avoidance distances. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged. T-7A aircraft feature substantially louder operating characteristics in comparison with T-38C aircraft. Land area within the 65 and higher dBA DNL contour are discussed within the noise resources section.

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Hazardous Materials and Wastes				
No impacts would occur.	Short- and long-term, minor, adverse impacts would occur. The short-term impacts would result from the use of hazardous materials and petroleum products and the generation of hazardous wastes during construction for the MILCON and FSRM projects. The long-term impacts would result because the proposed increase in aircraft operations would also require additional quantities of jet fuel to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph.	Short- and long-term, minor, adverse impacts would occur. The short-term impacts would result from the use of hazardous materials and petroleum products and the generation of hazardous wastes during construction for the MILCON and FSRM projects. The long-term impacts would result because proposed increase in aircraft operations would also require additional quantities of jet fuel to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph. Compared to the Proposed Action, impacts would be slightly lesser because of the decreased flight operations.	Short- and long-term, minor, adverse impacts would occur. The short-term impacts would result from the use of hazardous materials and petroleum products and the generation of hazardous wastes during construction for the MILCON and FSRM projects. The long-term impacts would result because the proposed increase in aircraft operations would also require additional quantities of jet fuel to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph. Compared to the Proposed Action, impacts would be slightly greater because of the increased flight operations.	Short- and long-term, minor, adverse impacts would occur. The short-term impacts would result from the use of hazardous materials and petroleum products and the generation of hazardous wastes during construction for the MILCON and FSRM projects. The long-term impacts would result because the proposed increase in aircraft operations would also require additional quantities of jet fuel to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph. Compared to the Proposed Action, impacts would be slightly greater because of the increased flight operations.

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Infrastructure and Transportation				
No impacts would occur.	Impacts on infrastructure and transportation would be less than significant as sufficient capacity exists for the projected increases in buildings, people, and demand.	Identical impacts on infrastructure and transportation as the Proposed Action would occur. These impacts would be less than significant as sufficient capacity exists for the projected increases in buildings, people, and demand.	Identical impacts on infrastructure and transportation as the Proposed Action would occur. These impacts would be less than significant as sufficient capacity exists for the projected increases in buildings, people, and demand.	Identical impacts on infrastructure and transportation as the Proposed Action would occur. These impacts would be less than significant as sufficient capacity exists for the projected increases in buildings, people, and demand.
Safety				
No impacts would occur.	Short-term, minor, adverse impacts on contractor health and safety would occur during construction for the MILCON and FSRM projects. Long-term, negligible, adverse impacts on flight safety would occur from increased and nighttime aircraft operations resulting in an increased potential for Bird/Wildlife Aircraft Strike Hazard (BASH) incidents, including bat strikes, and other mishaps.	Short-term, minor, adverse impacts on contractor health and safety would occur during construction for the MILCON and FSRM projects. Long-term, negligible, adverse impacts on flight safety would occur from increased and nighttime aircraft operations resulting in an increased potential for BASH incidents, including bat strikes, and other mishaps. Compared to the Proposed Action, these impacts would be slightly lesser because of the decreased flight operations.	Short-term, minor, adverse impacts on contractor health and safety would occur during construction for the MILCON and FSRM projects. Long-term, negligible, adverse impacts on flight safety would occur from increased and nighttime aircraft operations resulting in an increased potential for BASH incidents, including bat strikes, and other mishaps. Compared to the Proposed Action, these impacts would be slightly greater because of the increased flight operations.	Short-term, minor, adverse impacts on contractor health and safety would occur during construction for the MILCON and FSRM projects. Long-term, negligible, adverse impacts on flight safety would occur from increased and nighttime aircraft operations resulting in an increased potential for BASH incidents, including bat strikes, and other mishaps. Compared to the Proposed Action, these impacts would be slightly greater because of the increased flight operations.

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Water Resources				
No impacts would occur.	Short- and long-term, negligible to minor, adverse impacts would occur. The MILCON and FSRM projects would increase impervious surface and decrease area for groundwater infiltration by approximately 132,050 ft^2 leading to potentially decreased recharge of groundwater and increased stormwater runoff into nearby surface water bodies. Increased hazardous materials and petroleum product use would negligibly increase the potential for an accidental release to occur and for the contamination to reach nearby groundwater aquifers and surface water features. The addition of approximately 879 people to Bexar County would not appreciably increase the demand for potable water or reduce regional groundwater availability in the Edwards Aquifer. No direct impacts on wetlands would occur. The MILCON and FSRM projects would not occur within or near the 100-year floodplain.	Similar impacts on water resources as the Proposed Action would occur. Compared to the Proposed Action, fewer aircraft to maintain and aircraft operations at a lower intensity would slightly decrease the potential for an accidental release of hazardous materials or petroleum products to contaminate groundwater aquifers and surface waters.	Similar impacts on water resources as the Proposed Action would occur. Compared to the Proposed Action, an increase in aircraft operations would slightly increase the potential for an accidental release of hazardous materials or petroleum products to contaminate groundwater aquifers and surface waters.	Similar impacts on water resources as the Proposed Action would occur. Compared to the Proposed Action, an increase in aircraft operations would slightly increase the potential for an accidental release of hazardous materials or petroleum products to contaminate groundwater aquifers and surface waters.

No Action Alternative	Proposed Action (Preferred Alternative)	Alternative 1 – Reduced Operations	Alternative 2 – 15 Percent Increase in Operations	Alternative 3 – 25 Percent Increase in Operations
Environmental Justice				
No impacts would occur.	Noise and air emissions would equally impact all populations in the affected area, thereby not disproportionately impacting environmental justice and sensitive receptor populations.	Noise and air emissions would be slightly less compared to the Proposed Action but would still equally impact all populations in the affected area, thereby not disproportionately impacting environmental justice and sensitive receptor populations.	Noise and air emissions would be slightly greater compared to the Proposed Action but would still equally impact all populations in the affected area, thereby not disproportionately impacting environmental justice and sensitive receptor populations.	Noise and air emissions would be slightly greater compared to the Proposed Action but would still equally impact all populations in the affected area, thereby not disproportionately impacting environmental justice and sensitive receptor populations.

2.6 Mitigation

Specific mitigation measures have been identified and will be carried forward to the extent practicable in implementing the selected alternative and will be defined in the Record of Decision. **Section 3** includes and analyzes mitigations for impacts identified or required by regulation or agency guidance for each affected resource. **Table 2-10** summarizes the mitigation measures.

A mitigation plan will be developed in accordance with 32 CFR 989.22(d) to address specific mitigations selected in the Record of Decision. NEPA imposes a continuing duty to supplement (40 CFR 1502.9(c)) existing NEPA documents when substantial changes are made that are relevant to environmental concerns or in response to the identification of "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9(c)(1)(ii)). The DAF is responsible for monitoring the predictions (e.g., impact, mitigations) made in its completed NEPA documentation (40CFR 1505.3, 1505.2(c)). If substantial changes are recognized that are relevant to environmental concerns or that bear on a proposed action or its impacts, the USAF would reevaluate for potential impacts related to those changes.

Table 2-10. Summary of Mitigation Measures

Air Quality
DAF would engage an adaptive management approach to further develop analysis of air quality impacts due to the operation of the new T-7A aircraft that are proposed to replace the current T-38C aircraft at JBSA-Randolph.
During this adaptive management approach, DAF would limit the total number of operations to remain below the GCR NOx de minimis value as those outlined under the Proposed Action through year 2026, which would be equivalent to the maximum outlined under Mitigated Alternative 1 Option 1B (the *de minimis* alternative) until such a time as a formal GCR demonstration can be made.
If any increases in operations are proposed for execution during the foregoing "adaptive management", DAF would perform additional GCR Applicability Analyses, and if necessary, a GCR Determination to ensure compliance with CAA § 176(c) and 40 CFR Part 93 Subpart B.
DAF would continue to seek emissions offsets, in the form of formalized, local, legally-enforceable, and permanent emission reductions to counterbalance increases in annual net changes in emissions associated with the Proposed Action, including both standard and early Emission Reduction Credits (ERC), as outlined as follows: • Standard ERCs are approved banked emission reductions (credits) that can be used by the owner or sold on the market as offsets on future actions either by the owner or a purchaser. Standard ERCs can only be used for a GCR determination, and along with any early ERCs, must fully and completely offset-to-zero all emissions from the Proposed Action. Additionally, standard ERCs used for a GCR determination must be from within the same nonattainment area or a nearby area of equal or higher classification. • Early ERCs are state-approved credits earned from a specific federal facility for emission reductions efforts that are both legally enforceable and permanent. Early ERCs are banked and only used by the federal facility that earned them and can be used for either a GCR applicability analysis or determination. If used in an applicability analysis, they can be used to offset only the amount of emissions to bring the action below a GCR *de minimis* value (100 tpy for this action). If used in a determination, the early ERCs (in conjunction with any other offsets) would offset 100 percent of the action-related emissions (between 155.4 to 197.8 tpy for this action).

JBSA would continue to implement an Energy Savings Performance Contract involving emission reductions and continue to pursue NO_X Early ERC credits that, if granted by Texas Commission on Environmental Quality (TCEQ), could be applied to a revised GCR Applicability Analysis or future determination. While the currently estimated Early ERCs (27 tons of NO_X) would not allow the Proposed Action to proceed to its full proposed operational level after year 2026, the formal Air Conformity Applicability Model (ACAM) shows the results would allow for an increase in T-7A flight operations above the levels in Alternative 1 (the *de minimis* alternative).
DAF would continue discussions with TCEQ on how to use the Energy Savings Performance Contract emissions reductions, if authorized. Since the timeline of the Early ERCs being granted by TCEQ is currently unknown, it is possible the use of the Early ERCs for the T-7A Recapitalization will not be necessary, or even possible. If and at the time that the Early ERCs are granted, JBSA reserves the option to bank the credits for future unrelated actions.
If sufficient Early ERCs are granted, DAF would perform additional GCR Applicability Analyses, and if necessary, a GCR Determination to ensure compliance with CAA § 176(c) and 40 CFR Part 93 Subpart B.
DAF would continue to investigate and implement an agreement between 502 ABW/CC and TCEQ to establish record keeping requirements and operations parameters to ensure that T-7A operations are conducted in such a manner as to conform with the requirements of CAA § 176(c) and 40 CFR Part 93. The draft agreement is provided in **Appendix B** of this EIS. The implementation of GCR *de minimis* constraints would also require annual reporting starting in 2023 to demonstrate and document flight operations did not exceed the *de minimis* values for the calendar year. The annual reporting must be available to the state and the general public upon request.
Noise
DAF would conduct noise modeling with operational T-7A noise source data, when available, to corroborate the accuracy of the Final EIS results, which used the T-7A noise source data in an aircraft testing scenario for noise modeling and used T-38C training flight parameters such as power settings, patterns, altitudes, etc., because specific training performance specifications for the T-7A airframe operating in the San Antonio region are not yet available.
DAF would limit the use of afterburner up to five percent of all takeoffs.
DAF would consider avoidance of low-level flight over Sunday morning religious services (Saturday morning for churches that primarily have services on those days) over several church POIs as part of mitigation.
Biological Resources
DAF would conduct nesting surveys as necessary prior to construction activities. If activities occur during the MBTA-nesting season (March 15 through September 15), a qualified biologist would conduct nest surveys to determine if there are any active nests present. Nest surveys would be conducted no more than five days prior to the scheduled clearing. If active nests are observed, a 150-foot buffer of vegetation would be left intact until the young have fledged or the nest is abandoned.

3. Affected Environment and Environmental Consequences

This section describes the environmental resources and baseline conditions that could be affected by the Proposed Action and alternatives. It also presents an analysis of the potential environmental consequences from the Proposed Action, three action alternatives, and No Action Alternative. The Proposed Action and alternatives were evaluated for their potential environmental consequences on the environmental resources in accordance with CEQ NEPA regulations at 40 CFR § 1508.8.

In compliance with NEPA, CEQ, and DAF EIAP regulations and guidelines, this EIS focuses only on those environmental resources considered potentially subject to significant impacts from the Proposed Action and alternatives. DAF used the scoping process to identify environmental issues to be carried forward for analysis and deemphasize insignificant issues. The environmental resources analyzed within are air quality, noise, biological resources, cultural resources, land use, hazardous materials and wastes, infrastructure and transportation, safety, water resources, and environmental justice. The environmental resources not analyzed in detail in this EIS because clearly insignificant or no impacts would occur are airspace configurations, geological resources, and socioeconomics. The following paragraphs explain why those four resources were dismissed from detailed analysis in this EIS.

Airspace. The SUA consists of airspace of defined dimensions wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both. The airspace is also defined in terms of floor and ceiling altitudes as well as times for which the airspace is active. The SUA for this action includes a Restricted Area (i.e., McMullen Range) and seven MOAs. Restricted Areas are typically used by the military where local controlling authorities have determined that air traffic must be restricted or prohibited for safety or security concerns. An MOA is airspace established to separate certain nonhazardous military activities from Instrument Flight Rules traffic and to identify for Visual Flight Rules traffic where those activities are performed. In addition to the SUA, flight corridors referred to MTRs are used to connect the MOAs and McMullen Range. MTRs are established for use by the military for the purpose of performing low-altitude, high-speed training. Routes above 1,500 feet above ground level (AGL) are developed to be flown, to the maximum extent possible, under Instrument Flight Rules. Routes at 1,500 feet AGL and below are generally developed to be flown under Visual Flight Rules. A list and description of the currently used SUA and MTRs is provided in **Table 3-1**.

Table 3-1. T-38C Airspace in South Texas

Airspace Designation	Type of Airspace	Short Description[1]
McMullen Range (R-6312)	Restricted Area	McMullen Range includes both Yankee and Dixie target areas. The major portion of this restricted area extends vertically from the surface to flight level 230 (23,000 above mean sea level). Hours of operation are sunrise to sunset, and other times by Notice to Airmen (NOTAM).
Brady Low	MOA	Located over portions of Llano, McCulloch, Mills, and San Saba Counties. Altitudes are from 500 feet AGL to but not including 6,000 feet mean sea level (MSL) with exclusions around the Curtis, Texas airport and San Saba County Municipal Airport. Time of use is from sunrise to 10 p.m. local, Monday through Friday; and other times by NOTAM.
Brady High	MOA	Located over portions of Llano, McCulloch, Mills, and San Saba Counties. Altitude is from 6,000 feet MSL to but not including 18,000 feet MSL. Time of use is from sunrise through 10 p.m., Monday through Friday; and other times by NOTAM.
Brady North	MOA	Located over portions of Concho, McCulloch, Mills, and San Saba Counties. Altitudes are from 3,600 feet MSL, up to, but not including 18,000 feet MSL. Time of use is from sunrise to 10 p.m., Sunday through Friday; and other times by NOTAM.
Randolph 1A	MOA	Located over portions of DeWitt, Gonzales, Jackson, Lavaca, and Victoria Counties. Altitudes are from 8,000 feet MSL to but not including 18,000 feet MSL. Times of use are sunrise to sunset, local time, Monday through Friday; and other times by NOTAM.
Randolph 1B	MOA	Located over portions of DeWitt, Karnes, and Wilson Counties. Altitudes are from 7,000 feet MSL to but not including 18,000 feet MSL. Times of use are sunrise to sunset, Monday through Friday; and other times by NOTAM.
Randolph 2A	MOA	Located over portions of Bandera, Frio, Medina, Real, Uvalde, and Zavala Counties. Altitudes are from 9,000 feet MSL to but not including 18,000 feet MSL. Times of use are sunrise to sunset, Monday through Friday; and other times by NOTAM.
Randolph 2B	MOA	Located over portions of Bandera, Bexar, and Medina Counties. Altitudes are from 14,000 feet MSL to but not including 18,000 feet MSL. Times of use are sunrise to sunset, Monday through Friday; and other times by NOTAM.
VR140	MTR	VR140 originates approximately 40 miles north of JBSA-Randolph in south-central Blanco County and transits through Gillespie, Kimble, Kerr, Bandera, Real, Uvalde, Zavala, Dimmit, LaSalle, Frio, and Atascosa Counties. Hours of operation are from sunrise to sunset, daily.
VR143	MTR	Located to the south of the Brady MOAs and transits through portions of Llano, Mason, Kimble, Sutton, Schleicher, Menard, Mason Counties. Hours of operation are 7 a.m. to 10 p.m. and other times by NOTAM.
VR156	MTR	Located to the east of Randolph 2A MOA and transits through Atascosa, Frio, LaSalle, and Webb Counties. Hours of operation are 8 a.m. to 6:30 p.m. daily. Prior coordination required for Sunday to Monday operations.

Airspace Designation	Type of Airspace	Short Description[1]
VR1120	MTR	Originating northeast of Seguin AAF, VR1120 transits through Bastrop, Caldwell, Gonzales, DeWitt, Karnes, Bee, Live Oak, and McMullen Counties. Hours of operation are sunrise to sunset.
IR123	MTR	Located to the south of the Brady MOAs and transits through portions of Llano, Mason, Kimble, Sutton, Schleicher, Menard, Mason Counties. Follows the VR143 profile and is seldom used. Hours of operation are 7 a.m. to 10 p.m. and other times by NOTAM.
IR148	MTR	The origin of IR148 is located about 40 miles south of JBSA-Randolph and transits from Atascosa County through Wilson, Gonzales, Fayette, Colorado, Lavaca, and DeWitt Counties. Hours of operation are 6 a.m. to 10:30 p.m.
IR149	MTR	IR149 originates on the northern portion of the Randolph 2A MOA and transits through Bandera, Kerr, Real, Edwards, Kinney, Maverick, Dimmit, and Webb Counties. Hours of operation are 6 a.m. to 10:30 p.m.

Sources: FAA 2021, DoD 2021a

Note: [1] The MTRs include several parts or "legs" that are designated by specific coordinates. Some legs within the same MTR have differing properties such as minimum/maximum altitudes, times of operation, speeds, etc. The short description provided in this table is an overview of the MTR in general. A complete description of the MTRs and their respective legs is available in the DoD Flight Information Publication AP/1B, Area Planning Military Training Routes, North and South America.

The Proposed Action and alternatives would have no impacts on existing airspace configurations (shape, size, altitudes). T-7A operations would occur within the same designated airspace boundaries currently used for T-38C operations (i.e., McMullen Range, Brady MOAs, Randolph MOAs, VR140, VR143, VF156, VR1120, IR123, IR148, and IR149). No changes in the location, size, shape or altitudes to the existing airspace would occur. The manner in which the airspace is used would not change. All aircraft using JBSA-Randolph, JBSA-Lackland, and Seguin AAF would continue to follow the same flight profiles (e.g., airfield approach and departure paths). As such, further analysis of airspace configuration impacts is unnecessary for this EIS. Impacts to other resources within the airspace areas will be assessed as appropriate (i.e., air quality, noise, natural resources, environmental justice).

As noted in **Section 2.1.2**, DAF is in the initial stages of working with FAA to define proposals that would address existing airspace deficiencies for low altitude training in southcentral Texas. Airspace adjustments are needed to support multiple aircraft and weapon system platforms to address the contemporary operating environment and more advanced, modernized capabilities of DAF equipment, and the need for low-level flight training for combat pilots is one that DAF is evaluating at multiple locations across the United States. The T-7A recapitalization would be considered for implementation at JBSA-Randolph whether or not the low-level airspace modification proposal is pursued by DAF. Furthermore, the airspace proposal is not yet fully defined with respect to its scope or requirements. DAF envisions fully defining airspace requirements and beginning a separate EIS in 2022, eventually working with FAA to complete the EIS sometime in 2024. Any T-7A aircraft addressed in this EIS would not use future proposed airspace until a full and complete analysis is completed. This would include analysis

of air quality GCR requirements and other impacts that are required to support DAF and FAA decision making. This EIS only evaluates the training of pilots using the T-7A in existing configurations of training airspaces.

Geological Resources. The Proposed Action and alternatives would have no significant impacts on geological resources. No impacts on regional geology and local topography would occur. Construction for the MILCON and FSRM projects would be small enough in scope that it would not alter geological structures and features. The projects would occur on mostly flat land, and no appreciable changes to local topography would occur. South Texas has a very low potential for damaging earthquakes (USGS 2021); therefore, seismic hazards would have no impact on new construction.

The U.S. Department of Agriculture has identified the soils within the footprint of the MILCON and FSRM projects as the Lewisville silty clay, 0 to 1 percent slopes, and Branyon clay, 0 to 1 percent slopes (USDA NRCS 2021). However, the projects would occur within highly urbanized areas on JBSA-Randolph where it is likely that these soil complexes have been disturbed from previous construction and landscaping and little natural soil structure remains. During project design, appropriate geotechnical surveys would be completed to ensure that soil limitations are identified and addressed, as necessary. Although both soil complexes have the physical properties necessary for classification as prime farmland soils (USDA NRCS 2021), all construction would occur within the U.S. Census Bureau-designated San Antonio, Texas Urbanized Area or on JBSA-Randolph's airfield (U.S. Census Bureau 2010). Soils within such areas are not subject to the Farmland Protection Policy Act; therefore, no impacts on prime farmlands would occur.

Construction for the MILCON and FSRM projects would disturb soil potentially resulting in the loss of structure, compaction, and erosion of soil as well as changes to local water infiltration and drainage patterns. Soil erosion and sediment control measures would be implemented, as appropriate, and could include installing silt fencing and sediment traps, applying water to disturbed soil to prevent wind erosion, and vegetating disturbed areas as soon as possible. Erosion and Sediment Control Plans would be prepared and implemented, as necessary, to reduce soil erosion and sedimentation. Stormwater control measures that favor infiltration would be implemented to minimize the potential for erosion and sediment production from storm events (see **Section 3.9** for water resources impacts).

No ground disturbance would occur at JBSA-Lackland and Seguin AAF; therefore, no impacts on geological resources would occur at these JBSA installations. Likewise, no impacts on geological resources beneath the airspace areas would occur; therefore, geological resources in the airspace areas are not analyzed further.

Socioeconomics. The Proposed Action and alternatives would have insignificant impacts on socioeconomics. As shown in **Table 2-2**, 303 new personnel would be added to the JBSA-Randolph workforce over 12 years. DAF has estimated that on average active-duty personnel are accompanied by 1.9 dependents (DAF 2018). Therefore, for the purposes of this EIS, the Proposed Action and alternatives are assumed to add 303 new personnel and 576 dependents for 879 new residents to Bexar County. No additional personnel would be added to JBSA-Lackland and Seguin AAF or to the communities within the airspace areas.

The demand for housing, schools, and other public services would increase from the addition of these personnel and their dependents, but it would not be noticeable given the population and population growth rate of Bexar County. As of July 2019, Bexar County is home to approximately 2 million inhabitants and is one of the fastest growing counties in the United States, having experienced an approximately 16.8 percent population increase since April 2010 (U.S. Census Bureau 2019). As of September 2021, the reported homeowner vacancy rate is 1.4 percent and the rental vacancy rate is 7.7 percent (Rate.com 2021). Therefore, the addition of approximately 879 new residents over 12 years would have insignificant impacts on socioeconomics. Based on the current distribution of JBSA-Randolph employees living throughout the San Antonio region, it is assumed that the addition of 576 dependents would be spread out and not create a burden on attendance at any single school.

Beneficial impacts on the local economy would occur from the sale of construction materials and employment of local construction workers for construction of the MILCON and FSRM projects at JBSA-Randolph. However, the increase in tax revenue and regional availability of building materials and labor would not be noticeably affected because of the limited scope and temporary duration of each project.

Adaptive Management. Due to the impacts from T-7A recapitalization at JBSA-Randolph, DAF is implementing Adaptive Management strategies to mitigate impacts addressed in **Section 3.1** and **Section 3.2** for Air Quality and Noise, respectively. The T-7A aircraft and how it is operated affect how both of those resources are directly impacted through engine emissions and engine/aircraft noise. A general description of the adaptive management strategy is provided in **Appendix D** and specific measures are provided in the discussion of mitigation for each of the two resources noted.

Because the T-7A aircraft has not yet been accepted into the DAF inventory, the aircraft has only been flown in testing. The test mode flying operations do not necessarily reflect those patterns and parameters that the T-7A will be used at JBSA-Randolph for pilot training. Therefore, once the T-7A is put into training operations at JBSA-Randolph, additional information will be required to more accurately forecast the potential impacts on air quality and noise. This additional information will be employed into an adaptive management strategy.

Some adaptations may require supplemental NEPA analysis, such as those that would result in a substantial change to the action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and have bearing on the proposed action or its impacts. Thus, the Post-Record of Decision (ROD) mitigation plan will include an adaptive management program incorporating (for example) the following kinds of adaptive management approaches:

- *Noise Modeling*. Supplement existing data with new noise data as it is being developed in the future. Use new data to reveal and understand the potential effects of activities or practices that are underway or being considered for implementation in the T-7A ramp up to final operational capability and thereafter. Make changes to improve mitigations and related actions.

- *Management and Oversight*. Monitor and evaluate results of earlier predictions. Develop and implement adaptations within the bounds of impacts analyzed in the selected alternative to eliminate or reduce effects.
- *New Knowledge and Information*. Through experimentation, knowledge and information can be incorporated into management options and recommendations.

3.1 Air Quality

3.1.1 Definition of the Resource

Air quality is the measure of pollution in ambient air (i.e., atmospheric air in its natural state). Clean air is fundamental to the health and well-being of humans, plants, and animals. Generally, clean air is a mixture of about 78 percent nitrogen; 21 percent oxygen; less than 1 percent of carbon dioxide, argon, and other gases; and varying amounts of water vapor. If there are particles or gases in the air that are not part of its normal composition, we call this "air pollution" and the particles or gases are called "air pollutants." The following sections include a discussion of the existing air quality conditions, a regulatory overview, and a summary of climate and greenhouse gases.

3.1.2 Affected Environment

The United States Environmental Protection Agency (USEPA) Region 6 and TCEQ regulate air quality in Texas. The CAA (42 USC §§ 7401–7671q), as amended, assigns the USEPA responsibility to establish National Ambient Air Quality Standards (NAAQS) for six common air pollutants that have been determined to harm health, environment, and property. These air pollutants, also known as “criteria pollutants,” are found in the air we breathe. USEPA regulates criteria pollutants as indicators of air quality based on the potential health and welfare effects of these pollutants. These criteria pollutants are as follows:

- Particle Pollutants (often referred to as particulate matter $PM_{2.5}$ and PM_{10}; the numbers refer to microns of diameter for the particles)
- NO_X (monitored and evaluated by its predominant nitrogen dioxide [NO_2] form)
- Ground Level Ozone (O_3, monitored and evaluated by its precursors Volatile Organic Compounds [VOCs] and NOx [both a criteria pollutant and an O_3 precursor])
- Carbon Monoxide (CO)
- Sulfur Oxides (SOx, monitored and evaluated by its predominant sulfur dioxide [SO_2] form)
- Lead (Pb).

It is on the basis of these criteria pollutants that health-based NAAQSs are set or revised by USEPA. While each state has the authority to adopt more stringent standards than those established under the federal program, the State of Texas has accepted the federal standards. **Table 3-2** outlines the NAAQS for each criteria pollutant.

Table 3-2. National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
CO		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Pb		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
NO_2		Primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and Secondary	Annual	53 ppb	Annual mean
O_3		Primary and Secondary	8-hour	0.070 ppm	Annual fourth highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter	$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
		Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
SO_2		Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA 2020a
Notes: ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter

3.1.2.1 Local Air Quality

The proposed action potentially impacts a large spatial area that has been broken into four separate air quality Regions of Influence (ROI) based on their regulatory requirements and the physical spatial distribution of the emissions sources associated with the action. The four ROIs for this action are Bexar County, Guadalupe County, Brady MOA, and Military Training Areas (MTRs, also including R-6312). For air quality impacts assessments, a ROI is a three-dimensional vertical column of air up to 3,000 ft above ground level (or the mixing zone, whichever is lower) where pollutant emissions associated with an action will occur. Each individual ROI requires a separate air quality assessment.

USEPA designated Bexar County as nonattainment for the 2015 8-hour O_3 NAAQS and attainment for all other criteria pollutants (USEPA 2021a). USEPA has designated all other areas associated with the action (including Guadalupe County, Brady MOA, and MTR ROIs) as in attainment for all criteria pollutants (USEPA 2021a).

3.1.2.2 Regulatory Overview

3.1.2.2.1 CAA General Conformity

The proposed T-7A Recapitalization action will occur primarily at JBSA–Randolph AFB. JBSA–Randolph AFB falls entirely within Bexar County which was designated by USEPA as a marginal nonattainment area for the 2015 8-hour Ozone NAAQS in 2018. Because of Bexar County's designation as an ozone nonattainment area, the portion of the action within the Bexar County ROI is subject to the GCR (40 CFR § 93 Subpart B) and a GCR evaluation (impact assessment) is required. A GCR evaluation is the entire progressive process from an Applicability Analysis through the GCR Determination that is used to demonstrate that an action conforms to the requirements of the GCR. An Applicability Analysis is an annual net change in emissions analysis used for determining if an action must be supported by a GCR Determination.

For marginal nonattainment areas, such as Bexar County, the GCR established annual net change in emissions *de minimis* values (insignificance threshold) of less than 100 tpy (for any given year) for both NOx and VOCs (i.e., ozone precursors) for the Applicability Analysis. If any action's annual net change in ozone precursor emissions is less than the *de minimis* levels, the proposed action is considered to have an insignificant impact on air quality for ozone and a GCR Determination is not required. However, if any of the proposed action's annual net change in ozone precursor emissions are greater than or equal to *de minimis* levels, a formal GCR Determination is required before the action can proceed. A GCR Determination is a formal evaluation that must demonstrate an action conforms to the states plan to meet the NAAQSs. If the GCR Determination does not demonstrate conformance, the action cannot proceed.

Guadalupe County, Brady MOA (including areas within McCulloch, San Saba, Llano, and McMullen Counties), and MTR (including areas within Atascosa, Bandera, Bastrop, Bee, Blanco, Caldwell, Comal, DeWitt, Dimmit, Frio, Gonzales, Hays, Jim Wells, Karnes, Kendall, La Salle, Live Oak, McMullen, Uvalde, Webb, and Zavala Counties) ROIs are all in full attainment for all criteria pollutants. As these ROIs are in attainment for all NAAQSs, the GCR does not apply to emissions associated with the action within these areas.

3.1.2.3 Regulatory Permitting

JBSA-Randolph operates under a single Title V air operating permit. The permit requirements include periodic inventory of all significant stationary sources of air emissions for each of the criteria pollutants of concern, source monitoring, and recordkeeping requirements. Primary stationary sources of air emissions include paint booths, fuel storage areas, aircraft engine test stand, and electric generators. Notably, Texas does not require permitting of mobile source emissions (e.g., aircraft flight and vehicle operations). In addition, there will be no construction of or changes in the stationary sources associated with the action; therefore, no new permitting is required.

3.1.2.4 Climate Change and Greenhouse Gases

The San Antonio Area has an average high temperature of 94.7 degrees Fahrenheit (°F) in the hottest month of August and an average low temperature of 38.6°F in the coldest month of January. The region has average annual precipitation of 32.9 inches per year. The wettest month of the year is May, with an average rainfall of 4.7 inches (Idcide 2021).

Greenhouse gases (GHGs) (e.g., carbon dioxide, methane, nitrous oxide) are components of the atmosphere that trap heat near the surface of the earth and, therefore, contribute to the greenhouse effect, climate change, and variability in global temperatures. Most GHGs occur naturally in the atmosphere, but increases in concentration result from human activities such as the burning of fossil fuels (USEPA 2016 and IPCC 2014).

EO 14008, *Tackling the Climate Crisis at Home and Abroad* (2021), outlines policies to reduce GHG emissions and to bolster resilience to the impacts of climate change. When considering GHG emissions and their significance, agencies should use appropriate tools and methodologies for quantifying GHG emissions, comparing GHG emission quantities across alternative scenarios, and review actions in the context of future climate scenarios and resiliency.

Furthermore, EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, requires Federal agencies to capture the full costs of GHG emissions as accurately as possible, including taking global damages into account. Doing so facilitates sound decision making, recognizes the breadth of climate impacts, and supports the international leadership of the United States on climate issues. The "social cost of carbon" (SCC) is an estimate of the monetized damages associated with incremental increases in GHG emissions, such as reduced agricultural productivity, human health effects, property damage from increased flood risk, and the value of ecosystem services. The interim SCC established by the Interagency Working Group for 2021 is estimated at 52 dollars per metric ton (IWG-SCGHG 2021).

3.1.3 Environmental Consequences

This section discusses the effects of the action on air quality and climate change. Effects to air quality posed by the action are evaluated by comparing the annual net change in emissions for each criteria pollutant against the GCR *de minimis* values for nonattainment areas or the DAF emissions insignificance indicators for attainment areas.

As stated previously, a proposed federal action must undergo a GCR evaluation (impact assessment). A GCR evaluation starts with an Applicability Analysis, which is an annual net change in emissions analysis used for determining if an action must be supported by a GCR Determination. Marginal nonattainment areas for ozone, such as Bexar County, are subject to annual net change in emissions *de minimis* values (insignificance threshold) of less than 100 tpy (for any given year) for both NOx and VOCs (i.e., ozone precursors). These *de minimis* values are applied in an Applicability Analysis to identify if an action is insignificant or a GCR Determination is required.

The basis for establishing insignificance indicators for attainment areas is from the preamble of the proposed 1994 GCR (58 Federal Regulation [FR] 13841, March 15, 1993), which stated that nonattainment area *de minimis* values were established based on the CAA major stationary

source definitions. General Conformity established criteria pollutant *de minimis* (insignificant) values for nonattainment areas at the major source level except for lead due to its toxicity. Therefore, similarly the attainment area Prevention of Significant Deterioration (PSD) 250 tpy threshold (as one of the CAA's major stationary source definitions) was applied for areas clearly in attainment, except for lead. Lead is a special case because not only is it a criteria pollutant, but it is also a listed Hazardous Air Pollutant; therefore, a 25 tpy insignificance value is used for lead.

3.1.3.1 Proposed Action

The Proposed Action would have minor short-term and significant long-term adverse effects on air quality. Short-term (2022 to 2026) minor effects would be from fugitive dust and the use of heavy equipment during construction and additional personnel, heated space, and aircraft flight operations during the initial phasing of T-38C to T-7A aircraft. Long-term (2027 and beyond) significant effects would be from substantial changes in aircraft flight activities at JBSA-Randolph, JBSA-Lackland, Seguin AAF, the MOAs, the MTRs, and R-6312. The Proposed Action would both (1) have NOx emissions that exceed the *de minimis* values in the Bexar County nonattainment area and (2) NOx emissions that exceed the insignificance indicator in the Guadalupe County ROI (an attainment area); however, it would not contribute to a violation of any federal, state, or local air regulation in the Guadalupe County ROI. A detailed assessment is provided as follows.

Separate assessments were performed for activities within Bexar County, Guadalupe County, the Brady MOA, and the MTRs ROIs. The GCR was established with NEPA in mind, and it is understood that actions with net emissions above the *de minimis* values within a nonattainment area may have greater than significant effects to air quality as they may interfere with the state's timely attainment of the NAAQS. To determine if a GCR Determination applies, and the level of effects under NEPA, the annual net change in direct and indirect emissions were compared to GCR *de minimis* values (40 CFR § 93.153) for Bexar County nonattainment pollutants (NO_X and VOCs, both precursors to O_3) and the DAF insignificance indicators of 25 tpy for Pb and 250 tpy for all other in attainment criteria pollutants.

The Air Force's ACAM was used to estimate the annual total net change in emissions from the Proposed Action during each year. Construction, demolition, and renovation emissions were estimated for fugitive dust, on- and off-road diesel equipment and vehicles, worker trips, architectural coatings, and paving off-gases. Operational emissions were estimated for changes in air flight operations, trim-tests, test cell operations, aerospace ground equipment, personnel, and heating of new facilities. The aircraft operations below the mixing height of 3,000 feet were included in the assessment for each ROI; notably, all flight operations within the Randolph 1A and Randolph 2A MOAs are projected to be above the mixing height.

Criteria Pollutants. **Table 3-3** provides the estimated total net change in emissions for Bexar County and Guadalupe County ROIs. **Table 3-4** provides the estimated total net change in emissions for the Brady MOA and MTRs ROIs. The total net change in annual emissions from the Proposed Action is expected to exceed the *de minimis* threshold value for NO_X in Bexar County beginning in 2027; therefore, a formal GCR Determination would be required before the Proposed Action could proceed. A GCR Determination is a formal evaluation that must demonstrate an action conforms to the states plan to meet NAAQSs. The estimated total net change in emissions from the Proposed Action would also exceed the insignificance indicator for NO_X in Guadalupe County; however, given the large areal extent of aircraft emission being released throughout the county, the net change would not contribute to a violation of any federal, state, or local air regulation. The estimated net change in annual emissions of all other criteria pollutants would not exceed the insignificance indicator for any other criteria pollutant in any of the ROIs. Detailed emission calculations have been included in **Appendix E**.

Bexar County is currently designated as a marginal nonattainment area and marginal nonattainment areas are not required to have a State Implementation Plan (SIP, a USEPA-approved formal plan for achieving attainment); therefore, Bexar County does not currently have a SIP. While all nonattainment areas must comply with the GCR (40 CFR § 93 Subpart B), marginal nonattainment (i.e., without a SIP) have limited GCR Determination options. In fact, without a SIP, currently the only GCR Determination options for the Proposed Action are through emission mitigation and offsets of the action's worst-case year emissions (154.3 tpy). All other GCR Determination paths require a SIP. See **Section 3.1.4** for further details on emission mitigation and offsets.

Mitigation is any method of reducing emissions taken at the location and time of the action and used to reduce the impact of the emissions caused by the action. Due to aggressive past efforts by JBSA to reduce emissions (e.g., shutting down their Total Energy Plant), there currently are no viable mitigation methods available at JBSA.

Offsets are formalized, local, legally enforceable, and permanent emission reductions used to counterbalance increases in annual net change in emissions associated with an action. Generally, offsets are obtained by two methods: standard (traditional) ERCs and Early ERCs. Standard (traditional) ERCs are approved banked emission reductions that can be used by the owner or sold on the market as offsets on future actions either by owner or purchaser. Early ERCs are state-approved credits earned from a specific federal facility for emission reductions efforts that are both legally enforceable and permanent. (See **Section 3.1.4** for further details on emission mitigation and offsets).

However, TCEQ is now planning for USEPA to reclassify the Bexar County ozone nonattainment area from marginal to moderate severity for the 2015 8-hour ozone standard, which would trigger requirement for the state to develop a formal SIP. If in the future the Bexar County ozone nonattainment area is reclassified to moderate, additional GCR Determination paths may (or may not) become available with the establishment of a future formal SIP.

Table 3-3. Estimated Annual Net Change in Emissions in Bexar County and Guadalupe County ROIs for the Proposed Action

Year	Net Emissions for the Bexar County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2022 (Construction)	0.5	2.1	2.3	<0.1	3.6	0.1	<0.1	507
2023	4.6	7.9	28.5	0.5	0.4	0.4	<0.1	2,523
2024	11.4	20.1	64.4	1.3	1.1	1.0	<0.1	4,891
2025	15.3	43.5	17.8	2.0	-0.7	-0.1	<0.1	6,643
2026	23.3	67.0	23.5	3.2	-1.2	-0.2	<0.1	9,680
2027	36.9	**108.5**	-5.1	4.8	-3.0	-1.2	<0.1	14,088
2028	44.7	**144.1**	-52.9	6.0	-5.2	-2.5	<0.1	17,275
2029	41.7	**147.5**	-103.0	5.7	-6.5	-3.4	<0.1	16,471
2030	36.6	**148.6**	-170.1	5.2	-8.3	-4.7	<0.1	14,987
2031	26.0	**145.7**	-287.9	4.0	-11.3	-6.9	<0.1	11,735
2032	29.1	**154.3**	-273.0	4.6	-11.0	-6.7	<0.1	13,320
>2032	29.1	**154.3**	-273.0	4.6	-11.0	-6.7	<0.1	13,320
Maximum	44.7	**154.3**	64.4	6.0	3.6	1.0	<0.1	17,275
*De minimis** or Insignificance Indicator	100*	100*	250	250	250	250	25	N/A
Exceeds **Indicator**?	No	**Yes**	No	No	No	No	No	N/A

Year	Net Emissions for the Guadalupe County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	6.8	7.9	109.3	2.2	3.1	1.4	<0.1	6,536
2024	18.5	20.5	151.6	3.4	3.7	2.0	<0.1	10,111
2025	17.9	87.4	39.0	5.8	0.7	0.6	<0.1	17,348
2026	18.7	135.8	-22.5	8.1	-1.0	-0.1	<0.1	24,311
2027	16.6	198.4	-153.6	10.7	-4.6	-1.9	<0.1	32,246
2028	13.6	238.3	-263.3	12.2	-7.6	-3.4	<0.1	36,798
2029	11.9	**255.1**	-317.5	12.5	-9.1	-4.1	<0.1	37,693
2030	8.0	**259.5**	-389.2	11.9	-11.0	-5.1	<0.1	35,724
2031	1.6	**259.8**	-494.6	10.5	-13.9	-6.6	<0.1	31,579
2032	1.8	**271.2**	-509.8	11.1	-14.4	-6.8	<0.1	33,540
>2032	1.8	**271.2**	-509.8	11.1	-14.4	-6.8	<0.1	33,540
Maximum	18.7	**271.2**	151.6	12.5	3.7	2.0	<0.1	37,693
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds **Indicator**?	No	**Yes**	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds *de minimis* or insignificance indicator.

Table 3-4. Estimated Annual Net Change in Emissions at the Brady MOA and MTR ROIs for the Proposed Action

Year	Net Emissions for the Brady MOA ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.1	1.1	-1.2	0.1	<0.1	<0.1	<0.1	157
2024	0.3	3.1	-3.3	0.1	-0.1	<0.1	<0.1	432
2025	0.6	7.3	-7.7	0.4	-0.2	<0.1	<0.1	1,061
2026	1.0	11.3	-11.9	0.5	-0.3	-0.1	<0.1	1,618
2027	1.7	18.5	-19.6	0.9	-0.5	-0.1	<0.1	2,638
2028	2.2	24.9	-26.3	1.2	-0.6	-0.1	<0.1	3,591
2029	2.3	25.7	-27.1	1.2	-0.6	-0.1	<0.1	3,696
2030	2.3	26.1	-27.5	1.2	-0.6	-0.1	<0.1	3,754
2031	2.3	25.9	-27.3	1.2	-0.6	-0.1	<0.1	3,733
2032	2.5	27.8	-29.3	1.3	-0.7	-0.2	<0.1	3,991
>2032	2.5	27.8	-29.3	1.3	-0.7	-0.2	<0.1	3,991
Maximum	2.5	27.8	-1.2	1.3	<0.1	<0.1	<0.1	3,991
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Year	Net Emissions for the MTR ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.5	4.8	-2.3	0.3	<0.1	<0.1	<0.1	812
2024	1.3	13.1	-11.2	0.7	-0.2	<0.1	<0.1	1,986
2025	2.9	31.1	-30.0	1.5	-0.7	-0.1	<0.1	4,572
2026	4.4	47.9	-48.0	2.3	-1.1	-0.2	<0.1	6,947
2027	7.2	78.7	-81.0	3.7	-1.8	-0.4	<0.1	11,291
2028	9.6	105.9	-109.6	5.0	-2.5	-0.6	<0.1	15,212
2029	9.9	109.1	-112.9	5.2	-2.6	-0.6	<0.1	15,657
2030	10.0	110.7	-114.7	5.3	-2.6	-0.6	<0.1	15,894
2031	10.0	110.1	-114.0	5.2	-2.6	-0.6	<0.1	15,803
2032	10.6	117.9	-122.3	5.6	-2.8	-0.6	<0.1	16,900
>2032	10.6	117.9	-122.3	5.6	-2.8	-0.6	<0.1	16,900
Maximum	10.6	117.9	-2.3	5.6	<0.1	<0.1	<0.1	16,900
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds insignificance indicator.

Greenhouse Gases. Consistent with EO 14008 and CEQ Final Guidance, this EIS examines GHGs as a category of air emissions. It also examines potential future climate scenarios to determine whether elements of the Proposed Action would be affected by climate change. This EIS does not attempt to measure the actual incremental impacts of GHG emissions from the Proposed Action, as there is a lack of consensus on how to measure such impacts. Global and regional climate models have substantial variation in output and do not have the ability to measure the actual incremental impacts of a project on the environment. For reference purposes, **Table 3-5** compares the estimated annual net change in GHG emissions from the Proposed Action and alternatives to each other, and to the statewide, nationwide, and global GHG emissions, and provides the SCC for the different action alternatives.

Table 3-5. Estimated Annual Net Change in GHG Emissions and Social Cost of Carbon

Scale	CO_2e Emissions (MMT/yr)	Compared to Proposed Action	Social Cost of Carbon ($/yr)
Global	43,125	62,533,697%	$2,242,500,000,000
United States	6,870	9,961,890%	$357,240,000,000
Texas	625.8	907,446%	$32,541,600,000
Proposed Action	0.0690	100%	$3,588,000
Alternative 1	0.0502	73%	$2,610,400
Alternative 2	0.0813	118%	$4,227,600
Alternative 3	0.0871	126%	$4,529,200

Sources: DAF 2020a, USEPA 2020b, and USEIA 2018
Key: MMT = million metric tons
Note: SCC calculation assumes all CO_2e emissions are carbon dioxide.

Table 3-6 outlines potential climate stressors and their effects on the Proposed Action. All elements of the Proposed Action in-and-of-themselves are only indirectly dependent on any of the elements associated with future climate scenarios (e.g., meteorological changes). At this time, no future climate scenario or potential climate stressor would have appreciable effects on any element of the Proposed Action.

Table 3-6. Effects of Potential Climate Stressors

Potential Climate Stressor	Effects on the Proposed Action and Alternatives
More frequent and intense heat waves	Negligible
Longer fire seasons and more severe wildfires	Minor
Chances in precipitation patterns	Negligible
Increased drought	Negligible
Harm to water resources, agriculture, wildlife, ecosystems	Negligible

Source: NCA 2014

3.1.3.1.1 Alternative 1

Alternative 1 (first alternative to the Proposed Action) would entail only scaling back the Proposed Action's T-7A flight operations to keep the annual net change in emissions below the 100 tpy GCR *de minimis* values for NOx and VOCs. The implementation of Alternative 1 would require annual reporting to the state to demonstrate and document flight operations did not exceed the *de minimis* values for the calendar year. The number of aircraft and intensity of flight operations under this alternative, if selected, would be adequate to meet flight training and basing requirements up to the 2026 level of flight operations (the reasonably foreseeable future). Should the future training mission require additional flight operations, a reevaluation of compliance with the GCR would be required (40 CFR § 93.157) based on Bexar County's attainment status at that time. One option for the GCR reevaluation would be to apply Early ERCs and demonstrate through a revised Applicability Analysis that, with the inclusion of Early ERC offsets, the annual net change in emissions would still be below the 100 tpy GCR *de minimis* value (see **Section 3.1.4** for further details on emission mitigation and offsets).

Alternative 1 (the first alternative to the Proposed Action) would have insignificant (*de minimis*) short- and long-term adverse impacts on air quality. Short-term (2022 to 2026) insignificant effects would be from fugitive dust and the use of heavy equipment during construction and additional personnel, heated space, and aircraft flight operations during the initial phasing of T-38C to T-7A aircraft. Long-term (2027 and beyond) insignificant effects would be from substantial changes in aircraft flight activities at JBSA-Randolph, JBSA-Lackland, Seguin AAF, the MOAs, the MTRs, and R-6312. Emissions in Bexar County would not exceed the GCR *de minimis* values; therefore, a formal GCR Determination would not be required. Additionally, all emission at the Guadalupe County, Brady MOA, and MTRs ROIs are insignificant; therefore, this alternative would not contribute to a violation of any federal, state, or local air regulation. A detailed assessment is provided as follows.

Criteria Pollutants. **Table 3-7** and **Table 3-8** outline the estimated total net change in emissions for Alternative 1 during each year. As with the Proposed Action, both construction and flight operational emissions were assessed. The total net change in annual emissions from Alternative 1 would not exceed the *de minimis* threshold values for NOx or VOCs in Bexar County; therefore, a formal GCR Determination would not be required. The estimated total net change in annual emissions from Alternative 1 would not exceed DAF insignificance indicators for all attainment pollutants in Bexar County, Guadalupe County, Brady MOA, and MTRs ROIs; therefore, the level of impact would be less than significant. Detailed emission calculations are included in **Appendix E**.

Greenhouse Gases. Alternative 1 would generate 0.050 MMT of CO_2e, which is 73 percent of the GHG emissions compared to the Proposed Action (**Table 3-5**). As with the Proposed Action, GHG emissions from Alternative 1 would be minute when compared to the statewide, nationwide, and global GHG emissions. As with the Proposed Action, and for similar reasons, no future climate scenario or potential climate stressor would have appreciable effects on any element of Alternative 1. The SCC for Alternative 1 would be $2,610,400 per year.

Table 3-7. Estimated Annual Net Change in Emissions at Bexar County and Guadalupe County ROIs for Alternative 1

Year	Net Emissions for the Bexar County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2022 (Construction)	0.5	2.1	2.3	<0.1	3.6	0.1	<0.1	507
2023	4.6	7.9	28.5	0.5	0.4	0.4	<0.1	2,523
2024	11.4	20.1	64.4	1.3	1.1	1.0	<0.1	4,891
2025	15.4	43.6	18.8	2.0	-0.7	-0.1	<0.1	6,699
2026	23.4	67.0	24.4	3.2	-1.1	-0.2	<0.1	9,732
2027	31.4	99.5	-30.6	4.2	-3.5	-1.6	<0.1	12,412
2028	-10.5	99.4	-540.9	-0.3	-16.7	-11.3	<0.1	2
2029	-10.5	99.4	-540.9	-0.3	-16.7	-11.3	<0.1	2
2030	-10.5	99.4	-540.9	-0.3	-16.7	-11.3	<0.1	2
2031	-10.5	99.4	-540.9	-0.3	-16.7	-11.3	<0.1	2
2032	-10.5	99.4	-540.9	-0.3	-16.7	-11.3	<0.1	2
>2032	-10.5	99.4	-540.9	-0.3	-16.7	-11.3	<0.1	2
Maximum	31.4	99.5	64.4	4.2	3.6	1.0	<0.1	12,412
*De minimis** or Insignificance Indicator	100*	100*	250	250	250	250	25	N/A
Exceeds *de minimis* or Indicator?	No	No	No	No	No	No	No	N/A

Year	Net Emissions for the Guadalupe County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	6.8	7.9	109.3	2.2	3.1	1.4	<0.1	6,536
2024	8.3	24.2	108.5	3.3	3.1	1.5	<0.1	9,899
2025	7.1	82.8	-4.6	5.4	0.0	0.0	<0.1	16,333
2026	7.9	131.3	-66.0	7.7	-1.6	-0.7	<0.1	23,296
2027	5.2	189.4	-199.2	9.8	-5.3	-2.5	<0.1	29,824
2028	-20.2	198.8	-625.5	5.1	-16.9	-8.7	<0.1	15,477
2029	-20.2	198.8	-625.5	5.1	-16.9	-8.7	<0.1	15,477
2030	-20.2	198.8	-625.5	-5.1	-16.9	-8.7	<0.1	15,477
2031	-20.2	198.8	-625.5	-5.1	-16.9	-8.7	<0.1	15,477
2032	-20.2	198.8	-625.5	-5.1	-16.9	-8.7	<0.1	15,477
>2032	-20.2	198.8	-625.5	-5.1	-16.9	-8.7	<0.1	15,477
Maximum	8.3	198.8	109.3	9.8	3.1	1.5	<0.1	29,824
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds *de minimis* or insignificance indicator

Table 3-8. Estimated Annual Net Change in Emissions at the Brady MOA and MTR ROIs for Alternative 1

Year	Net Emissions for the Brady MOA ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.1	1.3	-1.4	0.1	<0.1	<0.1	<0.1	184
2024	0.3	3.6	-3.8	0.2	-0.1	<0.1	<0.1	504
2025	0.8	8.5	-8.9	0.4	-0.2	<0.1	<0.1	1,236
2026	1.2	13.1	-13.9	0.6	-0.3	-0.1	<0.1	1,885
2027	1.8	19.9	-21.1	0.9	-0.5	-0.1	<0.1	2,833
2028	1.9	21.6	-22.9	1.0	-0.5	-0.1	<0.1	3,095
2029	1.9	21.6	-22.9	1.0	-0.5	-0.1	<0.1	3,095
2030	1.9	21.6	-22.9	1.0	-0.5	-0.1	<0.1	3,095
2031	1.9	21.6	-22.9	1.0	-0.5	-0.1	<0.1	3,095
2032	1.9	21.6	-22.9	1.0	-0.5	-0.1	<0.1	3,095
>2032	1.9	21.6	-22.9	1.0	-0.5	-0.1	<0.1	3,095
Maximum	1.9	21.63	-1.4	1.0	<0.1	<0.1	<0.1	3,095
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Year	Net Emissions for All MTRs and R-6312 (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.5	5.6	-5.9	0.3	-0.1	<0.1	<0.1	782
2024	1.4	15.2	-16.3	0.7	-0.4	-0.1	<0.1	2,148
2025	3.2	36.1	-38.3	1.7	-0.9	-0.2	<0.1	5,159
2026	5.0	55.8	-59.2	2.6	-1.4	-0.3	<0.1	7,925
2027	7.6	84.4	-89.8	4.0	-2.1	-0.5	<0.1	11,962
2028	8.2	91.9	-97.7	4.3	-2.2	-0.5	<0.1	13,036
2029	8.2	91.9	-97.7	4.3	-2.2	-0.5	<0.1	13,036
2030	8.2	91.9	-97.7	4.3	-2.2	-0.5	<0.1	13,036
2031	8.2	91.9	-97.7	4.3	-2.2	-0.5	<0.1	13,036
2032	8.2	91.9	-97.7	4.3	-2.2	-0.5	<0.1	13,036
>2032	8.2	91.9	-97.7	4.3	-2.2	-0.5	<0.1	13,036
Maximum	8.2	91.9	-5.9	4.3	-0.1	<0.1	<0.1	13,036
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds insignificance indicator.

3.1.3.1.2 Alternative 2

Alternative 2 (second alternative to the Proposed Action) would entail scaling up the Proposed Action's T-7A flight operations to approximately 15 percent greater than the Proposed Action starting in 2024. The number of aircraft and intensity of flight operations under this alternative, if selected, would be adequate to meet flight training requirements if the future training mission required a future surge or increase in pilot training operations. As with the Proposed Action, the total net change in annual emissions from Alternative 2 would exceed the *de minimis* value for NOx in Bexar County starting in 2027; therefore, a formal GCR Determination would be required before Alternative 2 could proceed. One potential option instead of a GCR Determination would be to apply enough Early ERC offsets to demonstrate, through a revised Applicability Analysis, that with the annual net change in emissions would still be below the 100 tpy GCR *de minimis* value (see **Section 3.1.4.1** for further details on Early ERCs).

Alternative 2 would have minor, short-term, and significant long-term adverse effects on air quality. Short-term (2022 to 2026) minor effects would be from fugitive dust and the use of heavy equipment during construction and additional personnel, heated space, and aircraft flight operations during the initial phasing of T-38C to T-7A aircraft. Long-term (2027 and beyond), significant effects would be from substantial changes in aircraft flight activities at JBSA-Randolph, JBSA-Lackland, Seguin AAF, the MOAs, the MTRs, and R-6312. Alternative 2 would both (1) have NOx emissions that exceed the *de minimis* value in the Bexar County nonattainment area and (2) NOx emissions that exceed the insignificance indicator in the Guadalupe County ROI (an attainment area); however, it would not contribute to a violation of any federal, state, or local air regulation in the Guadalupe County ROI. A detailed assessment is provided as follows.

Criteria Pollutants. **Table 3-99** provides the estimated total net change in emissions for Bexar County and Guadalupe County ROIs. **Table 3-10** provides the estimated total net change in emissions for the Brady MOA and MTRs ROIs. The total net change in annual emissions from Alternative 2 would exceed the *de minimis* threshold value for NO_X in Bexar County beginning in 2027; therefore, a formal GCR Determination would be required. The estimated total net change in emissions from Alternative 2 would also exceed insignificance indicator for NO_X in Guadalupe County; however, given the large areal extent of aircraft emission being released throughout the county, the net change would not contribute to a violation of any federal, state, or local air regulation. The estimated net change in annual emissions of all other criteria pollutants would not exceed the insignificance indicator for any other criteria pollutant in any of the ROIs. Detailed emission calculations have been included in **Appendix E**.

As with the Proposed Action, the total net change in annual emissions from Alternative 2 would exceed the *de minimis* value for NOx in Bexar County starting in 2027; therefore, a formal GCR Determination would be required before Alternative 2 could proceed.

Table 3-9. Estimated Annual Net Change in Emissions at Bexar County and Guadalupe County ROIs for Alternative 2

Year	Net Emissions for the Bexar County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2022 (Construction)	0.5	2.1	2.3	<0.1	3.6	0.1	<0.1	507
2023	4.6	7.9	28.5	0.5	0.4	0.4	<0.1	2,524
2024	13.0	22.8	72.5	1.5	1.2	1.1	<0.1	5,426
2025	18.9	49.6	35.5	2.5	-0.4	0.1	<0.1	7,838
2026	29.2	77.1	54.0	3.9	-0.6	0.2	<0.1	11,714
2027	43.7	**125.0**	40.0	6.0	-2.2	-0.5	<0.1	17,308
2028	54.9	**165.5**	8.7	7.5	-4.0	-1.4	<0.1	21,176
2029	52.4	**169.6**	-38.9	7.3	-5.3	-2.4	<0.1	20,537
2030	47.4	**171.0**	-104.8	6.8	-7.1	-3.6	<0.1	19,130
2031	36.6	**168.0**	-225.7	5.5	-10.1	-5.9	<0.1	15,710
2032	43.8	**180.4**	-189.0	6.4	-9.5	-5.3	<0.1	18,149
>2032	43.8	**180.4**	-189.0	6.4	-9.5	-5.3	<0.1	18,149
Maximum	54.9	**180.4**	72.5	7.5	3.6	1.1	<0.1	21,176
*De minimis** or Insignificance Indicator	100*	100*	250	250	250	250	25	N/A
Exceeds ***de minimis* or Indicator**?	No	**Yes**	No	No	No	No	No	N/A

Year	Net Emissions for the Guadalupe County (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	6.8	7.9	109.3	2.2	3.1	1.4	<0.1	6,537
2024	20.9	23.2	160.9	3.7	3.8	2.1	<0.1	10,928
2025	20.6	90.9	49.6	6.4	0.8	0.7	<0.1	19,119
2026	22.2	146.8	-10.2	9.2	-0.8	0.1	<0.1	27,584
2027	21.2	219.1	-138.9	12.5	-4.3	-1.6	<0.1	37,621
2028	18.7	**263.3**	-247.6	14.3	-7.3	-3.1	<0.1	43,080
2029	17.2	**282.8**	-301.2	14.8	-8.7	-3.8	<0.1	44,468
2030	13.4	**288.0**	-372.8	14.2	-10.7	-4.8	<0.1	42,660
2031	7.0	**288.6**	-478.2	12.8	-13.6	-6.3	<0.1	38,550
2032	7.4	**301.8**	-492.9	13.6	-14.0	-6.5	<0.1	40,939
>2032	7.4	**301.8**	-492.9	13.6	-14.0	-6.5	<0.1	40,939
Maximum	22.2	**301.8**	160.9	14.8	3.8	2.1	<0.1	44,468
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	**Yes**	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds *de minimis* or insignificance indicator

Table 3-10. Estimated Annual Net Change in Emissions at the Brady MOA and MTR ROIs for Alternative 2

Year	Net Emissions for the Brady MOA ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.1	1.1	-1.2	0.1	<0.1	<0.1	<0.1	157
2024	0.3	3.5	-3.8	0.2	-0.1	<0.1	<0.1	497
2025	0.7	8.4	-8.8	0.4	-0.2	<0.1	<0.1	1,220
2026	1.2	13.0	-13.7	0.6	-0.3	-0.1	<0.1	1,861
2027	1.9	21.3	-22.6	1.0	-0.5	-0.1	<0.1	3,034
2028	2.6	28.7	-30.2	1.4	-0.7	-0.2	<0.1	4,129
2029	2.6	29.5	-31.1	1.4	-0.7	-0.2	<0.1	4,250
2030	2.7	30.0	-31.6	1.4	-0.7	-0.2	<0.1	4,317
2031	2.7	29.8	-31.4	1.4	-0.7	-0.2	<0.1	4,291
2032	2.8	31.9	-33.7	1.5	-0.8	-0.2	<0.1	4,588
>2032	2.8	31.9	-33.7	1.5	-0.8	-0.2	<0.1	4,588
Maximum	2.8	31.9	-1.2	1.5	<0.1	<0.1	<0.1	4,588
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Year	Net Emissions for All MTRs and R-6312 (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.4	4.8	-5.1	0.2	-0.1	<0.1	<0.1	672
2024	1.4	15.1	-16.1	0.7	-0.4	-0.1	<0.1	2,122
2025	3.2	35.7	-37.8	1.7	-0.9	-0.2	<0.1	5,098
2026	4.9	55.1	-58.5	2.6	-1.3	-0.3	<0.1	7,830
2027	8.1	90.6	-96.4	4.2	-2.2	-0.5	<0.1	12,828
2028	10.9	121.8	-129.3	5.7	-3.0	-0.7	<0.1	17,338
2029	11.2	125.5	-133.2	5.9	-3.1	-0.7	<0.1	17,851
2030	11.4	127.4	-135.2	6.0	-3.1	-0.7	<0.1	18,126
2031	11.3	126.6	-135.0	5.9	-3.1	-0.7	<0.1	17,989
2032	12.1	135.6	-144.6	6.4	-3.3	-0.8	<0.1	19,250
>2032	12.1	135.6	-144.6	6.4	-3.3	-0.8	<0.1	19,250
Maximum	12.1	135.6	-5.1	6.4	-0.1	<0.1	<0.1	19,250
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds insignificance indicator

Because Bexar County is currently designated as a marginal nonattainment area, it does not currently have a SIP. Without a SIP, there are limited GCR Determination options. Therefore, the only current GCR Determination options for Alternative 2 (as with the Proposed Action) is through emission mitigation and offsets of the action's worst-case year emissions (180.4 tpy). All other GCR Determination paths require a SIP. Mitigation methods (reducing emissions at the location and time of the action) are currently not available at JBSA due to the aggressive and successful past emission reduction efforts removing all JBSA's surplus emission reduction capacity. Offsets (formalized, local, legally enforceable, and permanent counterbalancing emission reductions) could be obtained through standard (purchased) ERCs and Early ERCs.

As mentioned with the Proposed Action, TCEQ is planning for USEPA to reclassify the Bexar County ozone nonattainment area from marginal to moderate severity for the 2015 8-hour ozone NAAQS, which would trigger a requirement for the state to develop a formal SIP. If in the future the Bexar County ozone nonattainment area is reclassified to moderate, additional GCR Determination paths may (or may not) become available with the establishment of a future formal SIP.

Greenhouse Gases. Alternative 2 would generate 0.0813 MMT of CO_2e, which is 118 percent of the GHG emissions compared to the Proposed Action (**Table 3-5**). As with the Proposed Action, GHG emissions from Alternative 2 would be minute when compared to the statewide, nationwide, and global GHG emissions. As with the Proposed Action, and for similar reasons, no future climate scenario or potential climate stressor would have appreciable effects on any element of Alternative 2. The SCC for Alternative 2 would be $4,227,600 per year.

3.1.3.1.3 Alternative 3

Alternative 3 (third alternative to the Proposed Action) would entail scaling up the Proposed Action's T-7A flight operations to approximately 25 percent greater than the Proposed Action starting in 2028 with full capacity by 2031. The number of aircraft and intensity of flight operations under this alternative, if selected, would provide an even greater buffer than Alternative 2 in meeting any future training mission surge or increase in pilot training operations. Should a future training surge be required as depicted in Alternative 3, a reevaluation of compliance with the GCR would be required (40 CFR § 93.157) based on Bexar County's attainment status at that time. As with the Proposed Action and Alternative 2, the total net change in annual emissions from Alternative 3 would exceed the *de minimis* value for NOx in Bexar County starting in 2027; therefore, a formal GCR Determination would be required before Alternative 3 could proceed. One potential option for making a GCR Determination would be to apply Standard ERCs and Early ERCs (See **Section 3.1.4** for further details on ERCs) to offset 100 percent of the action-related emissions. Additionally, a potential option instead of a GCR Determination would be to apply enough Early ERC offsets to demonstrate, through a revised Applicability Analysis, that with the annual net change in emissions would still be below the 100 tpy GCR *de minimis* value (See **Section 3.1.4.1** for further details on Early ERCs).

Alternative 3 (as with Alternative 2) would have minor short-term and significant long-term adverse effects on air quality. Short-term (2022 to 2026) minor effects would be from fugitive dust and the use of heavy equipment during construction and additional personnel, heated space, and aircraft flight operations during the initial phasing of T-38C to T-7A aircraft. Long-

term (2027 and beyond) significant (greater than Alternative 2) effects would be from substantial changes in aircraft flight activities at JBSA-Randolph, JBSA-Lackland, Seguin AAF, the MOAs, the MTRs, and R-6312. Alternative 3 would both (1) have NOx emissions that exceed the *de minimis* values in the Bexar County nonattainment area; and (2) NOx emissions that exceed the insignificance indicator in the Guadalupe County ROI (an attainment area); however, it would not contribute to a violation of any federal, state, or local air regulation in the Guadalupe County ROI. A detailed assessment is provided as follows.

Criteria Pollutants. **Table 3-11** provides the estimated total net change in emissions for Bexar County and Guadalupe County ROIs. **Table 3-12** provides the estimated total net change in emissions for the Brady MOA and MTRs ROIs. The total net change in annual emissions from Alternative 3 would exceed the *de minimis* threshold value for NO_X in Bexar County beginning in 2027; therefore, a formal GCR Determination would be required. The estimated total net change in emissions from Alternative 3 would also exceed the insignificance indicator for NO_X in Guadalupe County; however, given the large areal extent of aircraft emission being released throughout the county, the net change would not contribute to a violation of any federal, state, or local air regulation. The estimated net change in annual emissions of all other criteria pollutants would not exceed the insignificance indicator for any other criteria pollutant in any of the ROIs. Detailed emission calculations have been included in **Appendix E**.

As with the Proposed Action and Alternative 2, the total net change in annual emissions from Alternative 3 would exceed the *de minimis* value for NOx in Bexar County starting in 2027; therefore, a formal GCR Determination would be required before Alternative 3 could proceed.

Because Bexar County is currently designated as a marginal nonattainment area it does not currently have a SIP and therefore, without a SIP, there are limited GCR Determination options. The only current GCR Determination options for Alternative 3 (as with the Proposed Action) is through emission mitigation and offsets of the action's worst-case year emissions (197.8 tpy). All other GCR Determination paths require a SIP. Mitigation methods (reducing emissions at the location and time of the action) are currently not available at JBSA due to the aggressive and successful past emission reduction efforts removing all JBSA's surplus emission reduction capacity. Offsets (formalized, local, legally enforceable, and permanent counterbalancing emission reductions) could be obtained through standard (purchased) ERCs and Early ERCs.

As mentioned earlier, TCEQ is now planning for USEPA to reclassify the Bexar County ozone nonattainment area from marginal to moderate severity for the 2015 8-hour ozone standard, which would trigger a requirement for the state to develop a formal SIP. If in the future the Bexar County ozone nonattainment area is reclassified to moderate, additional GCR Determination paths may (or may not) become available with the establishment of a future formal SIP.

Table 3-11. Estimated Annual Net Change in Emissions at Bexar County and Guadalupe County ROIs for Alternative 3

Year	Net Emissions for the Bexar County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2022 (Construction)	0.5	2.1	2.3	<0.1	3.6	0.1	<0.1	507
2023	4.6	7.9	28.5	0.5	0.4	0.4	<0.1	2,524
2024	14.0	24.7	77.8	1.7	1.3	1.2	<0.1	5,783
2025	21.6	54.4	50.8	2.8	-0.1	0.4	<0.1	8,821
2026	33.0	83.8	73.4	4.4	-0.3	0.5	<0.1	13,004
2027	50.1	**136.1**	72.4	6.8	-1.6	0.0	<0.1	19,455
2028	63.5	**180.2**	52.9	8.6	-3.2	-0.8	<0.1	24,066
2029	61.2	**184.8**	6.6	8.4	-4.5	-1.7	<0.1	23,512
2030	56.5	**186.5**	-58.4	7.9	-6.3	-2.9	<0.1	22,158
2031	45.7	**183.4**	-176.7	6.7	-9.3	-5.1	<0.1	18,876
2032	54.8	**197.8**	-122.0	8.0	-8.3	-4.4	<0.1	22,393
>2032	54.8	**197.8**	-122.0	8.0	-8.3	-4.4	<0.1	22,393
Maximum	63.5	**197.8**	77.8	8.6	3.6	1.2	<0.1	24,066
*De minimis** or Insignificance Indicator	100*	100*	250	250	250	250	25	N/A
Exceeds *de minimis* Indicator?	No	**Yes**	No	No	No	No	No	N/A

Year	Net Emissions for the Guadalupe County ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	6.8	7.9	109.3	2.2	3.1	1.4	<0.1	6,537
2024	22.5	25.0	167.0	3.9	3.9	2.2	<0.1	11,472
2025	21.4	96.7	39.8	6.4	0.5	0.6	<0.1	19,069
2026	22.3	145.9	-21.2	8.8	-1.2	-0.1	<0.1	26,310
2027	21.3	217.9	-147.6	12.4	-4.7	-1.8	<0.1	37,166
2028	19.5	**268.1**	-254.5	14.7	-7.6	-3.2	<0.1	44,069
2029	18.2	**289.4**	-307.9	15.2	-9.1	-3.9	<0.1	45,783
2030	14.4	**295.0**	-379.3	14.7	-11.0	-4.9	<0.1	44,082
2031	8.1	**295.9**	-484.7	13.3	-13.9	-6.4	<0.1	39,996
2032	8.6	**310.2**	-499.0	14.2	-14.3	-6.6	<0.1	42,670
>2032	8.6	**310.2**	-499.0	14.2	-14.3	-6.6	<0.1	42,670
Maximum	22.5	**310.2**	167.0	15.2	3.9	2.2	<0.1	45,783
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	**Yes**	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds *de minimis* or insignificance indicator

Table 3-12. Estimated Annual Net Change in Emissions at the Brady MOA and MTR ROIs for Alternative 3

Year	Net Emissions for the Brady MOA ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.1	1.1	-1.2	0.1	<0.1	<0.1	<0.1	157
2024	0.3	3.8	-4.1	0.2	-0.1	<0.1	<0.1	540
2025	0.8	9.1	-9.6	0.4	-0.2	-0.1	<0.1	1,326
2026	1.3	14.1	-14.9	0.7	-0.3	-0.1	<0.1	2,023
2027	2.1	23.1	-24.5	1.1	-0.6	-0.1	<0.1	3,297
2028	2.8	31.2	-32.9	1.5	-0.8	-0.2	<0.1	4,488
2029	2.9	32.1	-33.8	1.5	-0.8	-0.2	<0.1	4,618
2030	2.9	32.6	-34.4	1.5	-0.8	-0.2	<0.1	4,690
2031	2.9	32.4	-34.2	1.5	-0.8	-0.2	<0.1	4,664
2032	3.1	34.7	-36.6	1.6	-0.8	-0.2	<0.1	4,986
>2032	3.1	34.7	-36.6	1.6	-0.8	-0.2	<0.1	4,986
Maximum	3.1	34.7	-1.2	1.6	<0.1	<0.1	<0.1	4,986
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Year	Net Emissions for the MTRs and R-6312 ROI (tpy)							
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	Pb	CO_2e
2023	0.4	4.8	-5.1	0.2	-0.1	<0.1	<0.1	672
2024	1.5	16.4	-17.5	0.8	-0.4	-0.1	<0.1	2,307
2025	3.5	38.8	-41.1	1.8	-0.9	-0.2	<0.1	5,540
2026	5.3	59.9	-63.6	2.8	-1.5	-0.3	<0.1	8,510
2027	8.8	98.4	-104.8	4.6	-2.4	-0.6	<0.1	13,942
2028	11.8	132.4	-140.5	6.2	-3.2	-0.8	<0.1	18,843
2029	12.2	136.4	-144.8	6.4	-3.3	-0.8	<0.1	19,401
2030	12.4	138.4	-146.9	6.5	-3.4	-0.8	<0.1	19,700
2031	12.3	137.6	-146.1	6.5	-3.4	-0.8	<0.1	19,586
2032	13.2	147.4	-156.5	6.9	-3.6	-0.8	<0.1	20,958
>2032	13.2	147.4	-156.5	6.9	-3.6	-0.8	<0.1	20,958
Maximum	13.2	147.4	-5.1	6.9	-0.1	0.0	<0.1	20,958
Insignificance Indicator	250	250	250	250	250	250	25	N/A
Exceeds Indicator?	No	No	No	No	No	No	No	N/A

Source: DAF 2020a
Key: CO_2e = carbon dioxide equivalents; N/A = not appliable; bold = exceeds insignificance indicator.

Greenhouse Gases. Alternative 3 would generate 0.0871 MMT of CO_2e, which is 126 percent of the GHG emissions compared to the Proposed Action (**Table 3-5**). As with the Proposed Action, GHG emissions from Alternative 3 would be minute when compared to the statewide, nationwide, and global GHG emissions. As with the Proposed Action and Alternative 2, and for similar reasons, no future climate scenario or potential climate stressor would have appreciable effects on any element of Alternative 3. The SCC for Alternative 3 would be $4,529,200 per year.

3.1.3.2 No Action Alternative

The No Action Alternative would not result in impacts on air quality. No facility construction would occur, and there would be no changes in aircraft flight operations. Air quality conditions would remain unchanged.

3.1.4 Mitigation, Offsets, and Adaptive Management

All federal facilities within nonattainment and maintenance areas must, under the GCR (40 CFR § 93, Subpart B), demonstrate conformance to a state's plan to achieve and maintain attainment for the area. The GCR established options to accomplish this through mitigation and offsets of emission. For air quality, both mitigation and offsets have specific definitions. Additionally, for nonattainment areas, like Bexar County, the GCR dictates when and how both mitigation and offsets may be used.

3.1.4.1 Mitigation

Mitigation is any method of reducing emissions taken at the location and time of the action and used to reduce the impact of the emissions caused by the action. Mitigation is used as an incorporated activity in the action to reduce action-related emissions for either a GCR Applicability Analysis or Determination. Due to aggressive past efforts by JBSA to reduce emissions (e.g., shutting down their Total Energy Plant) and the required timing of the action, there currently are no viable mitigation methods available at JBSA.

3.1.4.2 Offsets

Offsets are formalized, local, legally enforceable, and permanent emission reductions used to counterbalance increases in annual net change in emissions associated with an action. Generally, offsets are obtained by two methods: Standard (traditional) ERCs and Early ERCs.

Standard ERCs are approved banked emission reductions (credits) that can be used by the owner or sold on the market as offsets on future actions either by owner or purchaser. Standard ERCs can only be used for a GCR Determination and, along with any Early ERCs, must fully offset action-related emissions. Additionally, Standard ERCs used for a GCR Determination must be from within the same nonattainment area or a nearby area of equal or higher classification. Currently, there are no Standard ERCs available for the Bexar County nonattainment area (including JBSA); however, viable Standard ERCs are available from purchase on the open market from in the Houston area.

Early ERCs are state-approved credits earned from a specific federal facility for emission reductions efforts that are both legally enforceable and permanent. Early ERCs are banked and only used by the federal facility that earned them and can be used for either a GCR Applicability

Analysis or Determination. If used in an Applicability Analysis, they can be used to offset only the amount of emissions to bring the action below a GCR *de minimis* value (100 tpy for this action). If used in a GCR Determination, the Early ERCs (in conjunction with any other offsets) must offset 100 percent of the action-related emissions (between 155.4 and 197.8 tpy for this action).

JBSA is implementing an Energy Savings Performance Contract involving emission reductions and is currently in the process of potentially acquiring approximately 27 tons of Early ERC credits that, if granted by TCEQ, could be applied to a GCR Applicability Analysis or future Determination. While the 27 tons of NOx would not allow the Proposed Action to proceed to its full proposed operational level after year 2026, the formal ACAM shows the results would allow for an increase in T-7A flight operations above the levels in Alternative 1 (the *de minimis* alternative). It should be noted that the quantity of Early ERCs are only estimations at this point and have not been finalized by TCEQ. Even once the Early ERCs are finalized by TCEQ, it is only a possibility that they will be utilized for credit towards the T-7A Recapitalization impacts. A draft agreement to establish the JBSA Early ERC Program has been prepared and is available in **Appendix B**. TCEQ and USEPA Region 6 have concurred that the draft agreement, once approved by 502 WG/CC and TCEQ, will authorize the use of any earned Early ERCs with the selected action alternative. Since the timeline of the Early ERCs being granted by TCEQ is currently unknown, it is a possibility that the use of the Early ERCs for the T-7A Recapitalization would not be necessary, or even possible. If so and at the time that the Early ERCs are granted, JBSA would reserve the option to bank the credits for future unrelated actions as well (AFCEC/CZN 2021b).

Discussions with TCEQ have been on-going on how to use the Energy Savings Performance Contract emissions reductions, if authorized. One mitigation measure that is being evaluated is an agreement between 802 WG/CC and TCEQ, which will establish record keeping requirements and operations parameters to ensure that T-7A operations are conducted in such a manner as to conform with the requirements of CAA § 176(c) and 40 CFR § 93. The draft agreement is attached for review as part of this EIS.

3.1.4.3 Adaptive Management

DAF has determined to engage an adaptive management approach to further develop analysis of air quality and noise impacts due to the operation of the new T-7A aircraft that are proposed to replace the current T-38C aircraft at JBSA-Randolph. In short, the T-7A aircraft is still in production mode and undergoing testing with the manufacturer. DAF has contracted to purchase the T-7A aircraft but has not taken possession of any of these aircraft to date and, therefore, have not had the opportunity to fly the aircraft in a mode as it would be used for normal training purposes in the San Antonio area and airways. Therefore, the impacts developed and reported in this EIS for air quality and noise are based on reasonably foreseeable and currently known information with assumptions made for specific aircraft settings and operating parameters that have been identified as potentially changing with the development of a new aircraft. Realizing that the potential impacts reported for these two resources are significant, DAF determined that through an adaptive management strategy, the magnitude of impacts may be refined (if substantially different from the current best available information) once the T-7A aircraft is received into DAF inventory and engaged in the training

curriculum. A description of adaptive management and the DAF strategy to engage adaptive management for this action is included in **Appendix D**.

Any changes in operations evaluated and proposed for execution after the foregoing "adaptive management" is proposed for adoption must undergo a conformity applicability review, and if necessary, a general conformity determination to ensure compliance with CAA § 176(c) and 40 CFR § 93.

3.1.4.3.1 Mitigated Proposed Action

During the development of this Draft EIS, DAF has been considering specific actions that would potentially be further analyzed and assessed through an adaptive management strategy. One strategy is to further investigate the power settings and use of afterburners with the T-7A aircraft once they are flying in the training mission role at JBSA-Randolph. The strategy presented here is being incorporated as a mitigation measure to reduce the impacts to air quality for the Proposed Action. In an effort to reduce the aircraft noise impacts presented in **Section 3.2**, DAF identified the potential reduction of T-7A power settings and use of afterburner as a strategy that merited further investigation. Although precise data and knowledge of how the aircraft might efficiently and safely operate with the reduced settings are not yet known, DAF established that the first step was modeling the air quality and noise emissions with reduced power and afterburner settings, analyzing the preliminary results, and making a determination if this was a strategy that should be further explored. Noise experts from the Air Force Civil Engineer Center engaged with T-7A test pilots and discussed if a reduction was possible and, based on their experience, what a reasonable reduction might be to initiate the analysis. As a result of those discussions, DAF proceeded with modeling that would reduce the use of afterburner from 100 percent of all takeoffs to only 5 percent of all T-7A takeoffs from the JBSA-Randolph airfield. The preliminary analysis of the noise result for this specific adaptive management strategy is addressed in **Section 3.2.4.3**.

The air quality impacts modeled for the Proposed Action and alternatives were based on the current T-38C power settings and use of afterburner for reasons previously noted. The results of that modeling effort presented earlier in this section showed that for the Proposed Action (Preferred Alternative) and Alternatives 2 and 3, the NOx emissions would exceed the insignificance indicator of 100 tons per year in 2027 for each of the respective scenarios. Applying the reduction of using afterburner for only 5 percent of T-7A takeoffs from JBSA-Randolph only, the emissions were calculated for the Mitigated Proposed Action with reduced power settings and afterburner using ACAM and are presented in **Table 3-13**. **Table 3-14** shows a comparison of the calculated NOx emissions for the Mitigated Proposed Action and mitigated alternatives using reduced power settings and afterburner strategy at JBSA-Randolph only. The results indicate that reducing the use of afterburner for the same number of aircraft operations would increase the NOx emissions. The NOx increase would be due to T-7A aircraft engines emitting more NOx when the afterburner is not used.

The Mitigated Proposed Action would exceed the GCR emissions *de minimis* value for NOx in 2027; therefore, a formal GCR Determination with potential mitigation efforts would be required before the Mitigated Proposed Action could proceed at flight operation levels beyond 2026. However, the Mitigated Proposed Action would meet the GCR de minimis criteria if constrained

below the 100 tpy GCR *de minimis* value for NOx (i.e., constrain to 2025 net change emission levels) for the reasonably foreseeable future. To operate beyond the GCR *de minimis* constraints and up to outyears (beyond 2026) projected full-strength level (as depicted in the Mitigated Proposed Action's out years), a reevaluation of compliance with the GCR would be required (40 CFR 93.157) based on Bexar County's attainment status at that time. One option for the GCR reevaluation would be to apply Early ERCs and document through a revised Applicability Analysis that, with the inclusion of Early ERC offsets, the annual net change in emissions would still be below the 100 tons per year (tpy) GCR *de minimis* value. All other options involve an in-depth and formal GCR Determination.

Additionally, The implementation of the Mitigated Proposed Action GCR *de minimis* constraints would also require annual reporting to the state to demonstrate and document flight operations did not exceed the *de minimis* values for the calendar year.

Table 3-13. Estimated Annual Net Change in Emissions at Bexar County for Mitigated Proposed Action

	Net Emissions for the Bexar County ROI (tpy)							
Year	**VOC**	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**Pb**	**CO_2e**
2022	0.5	2.1	2.3	0.0	3.6	0.1	0.0	507
2023	4.3	8.4	24.6	0.5	0.3	0.3	<0.1	2,670
2024	10.4	20.9	37.8	1.2	0.5	0.4	<0.1	4,975
2025	12.9	45.2	-53.8	1.7	-2.3	-1.5	<0.1	6,747
2026	19.6	69.5	-91.9	2.6	-3.6	-2.5	<0.1	9,748
2027	30.7	**112.5**	-199.0	3.9	-7.2	-5.0	<0.1	14,157
2028	36.7	**149.6**	-311.9	4.9	-10.7	-7.5	<0.1	17,560
2029	32.9	**152.8**	-377.0	4.5	-12.4	-8.7	<0.1	16,361
2030	27.6	**154.0**	-448.3	3.9	-14.3	-10.1	<0.1	14,869
2031	17.1	**151.0**	-564.5	2.7	-17.3	-12.2	<0.1	11,617
2032	19.8	**157.7**	-705.6	1.8	-26.2	-18.7	<0.1	9,209
>2032	19.8	**157.7**	-705.6	1.8	-26.2	-18.7	<0.1	9,209
Maximum	36.7	**157.7**	37.8	4.9	0.5	0.4	<0.1	17,560
*De minimis** or Insignificance Indicator	100*	100*	250	250	250	250	25	N/A
Exceeds *de minimis* Indicator?	No	**Yes**	No	No	No	No	No	N/A

3.1.4.3.2 Mitigated Alternative 1

To determine the mitigated impacts to air quality in a manner consistent with that described for the Mitigated Proposed Action, the power settings and use of the afterburner for T-7A aircraft operations were reduced and modeled using ACAM. This resulted in the changes shown in **Table 3-14** in the column labeled Option 1A under the heading Mitigated Alternative 1. The

reduction of afterburner further increased the amount of NOx and resulted in an exceedance of the *de minimis* indicator in the years 2027 through 2031. This exceedance fails to meet the purpose of Alternative 1 Option 1A, which is to provide a level of operations that can meet training requirements and maintain new NOx source levels under 100 tpy. Therefore, DAF determined a level of aircraft operations that would meet the intent of Alternative 1 with reduced power settings and afterburner (Alternative 1 Option 1B). It was determined that the flight operations shown in **Table 2-5** would have to be reduced by about 3.5 percent. ACAM results are shown for Mitigated Alternative 1 – Option 1B in **Table 3-14** and all years remain below the *de minimis* indicator level for NOx. Recognizing this as a viable alternative, DAF has adopted the 1B option as the defined Mitigated Alternative 1. Detailed emission calculations are included in **Appendix E**.

The implementation of Mitigated Alternative 1 would also require annual reporting to the state to demonstrate and document flight operations did not exceed the *de minimis* values for the calendar year.

Should the future training mission require additional flight operations, a reevaluation of compliance with the GCR would be required based on Bexar County's attainment status at that time. One option for the GCR reevaluation would be to apply Early ERCs and demonstrate through a revised Applicability Analysis that, with the inclusion of Early ERC offsets, the annual net change in NOx emissions would still be below the 100 tpy GCR *de minimis* value.

Table 3-14. Comparison of NOx Emissions for the Mitigated Proposed Action and Mitigated Alternatives

Year	NOx Emissions (tpy)				
	Mitigated Proposed Action	Mitigated Alternative 1		Mitigated Alternative 2	Mitigated Alternative 3
		Option 1A	Option 1B		
2022	2.1	2.1	2.1	2.0	2.0
2023	8.4	8.4	8.4	8.4	8.4
2024	20.9	20.9	20.9	23.8	25.7
2025	45.2	45.2	45.2	52.0	56.5
2026	69.5	69.5	69.5	79.9	86.8
2027	**112.5**	**103.1**	99.6	**127.0**	**141.0**
2028	**149.6**	**103.4**	99.9	**170.0**	**187.9**
2029	**152.8**	**103.4**	99.9	**173.9**	**192.2**
2030	**154.0**	**103.4**	99.9	**175.4**	**194.0**
2031	**151.0**	**103.4**	99.9	**172.3**	**190.8**
2032	**157.7**	98.8	95.3	**180.6**	**200.2**
>2032	**157.7**	98.8	95.3	**180.6**	**200.2**
Exceeds *de minimis*?	**Yes**	**Yes**	**No**	**Yes**	**Yes**

3.1.4.3.3 Mitigated Alternative 2

Similar to the Proposed Action and Mitigated Proposed Action, the same reduction in power settings and afterburner was applied to the aircraft operations delineated for Alternative 2. **Table 3-14** shows the ACAM results for Mitigated Alternative 2. The results show an increase in NOx emissions for each year as compared to Alternative 2. Detailed emission calculations are included in **Appendix E**.

The implementation of Mitigated Alternative 2 would result in the net change in emissions exceeding the GCR emissions *de minimis* value for NOx; therefore, a formal GCR Determination with potential mitigation efforts would be required before this mitigated alternative could proceed.

3.1.4.3.4 Mitigated Alternative 3

Similar to the Proposed Action and Mitigated Proposed Action, the same reduction in power settings and afterburner was applied to the aircraft operations delineated for Alternative 3. **Table 3-14** shows the ACAM results for Mitigated Alternative 3. The results show an increase in NOx emissions for each year as compared to Alternative 3. Detailed emission calculations are included in **Appendix E**.

The implementation of Mitigated Alternative 3 would result in the net change in emissions exceeding the GCR emissions *de minimis* value for NOx; therefore, a formal GCR Determination with potential mitigation efforts would be required before this mitigated alternative could proceed.

3.2 Noise

3.2.1 Definition of the Resource

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life such as aircraft operations, construction, or vehicular traffic.

Sound varies by intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighing," measured in dBA, approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their sound levels are provided in **Table 3-15**.

Table 3-15. Common Sounds and Their Levels

Outdoor	Sound Level (dBA)	Indoor
Jet flyover at 1,000 feet	100	Rock band
Gas lawnmower at 3 feet	90	Food blender at 3 feet
Downtown (large city)	80	Garbage disposal
Heavy traffic at 150 feet	70	Vacuum cleaner at 10 feet
Normal conversation	60	Normal speech at 3 feet
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room

Source: CALTRAN 2013

The sound pressure level noise metric describes steady noise levels, although very few noises are, in fact, constant; therefore, additional noise metrics have been developed to describe noise including the following:

- Maximum Sound Level (L_{max}) – L_{max} is the maximum sound level in decibels.
- Number of events above 75 dBA Lmax (NA75Lmax) – NA75Lmax is the total number of events that exceed 75 dBA. NA75Lmax accounts for individual acoustic events, such as aircraft overflights, that exceed the threshold for speech interference within an exposed building such as a home or school with its windows closed.
- Time above 75 dBA (TA75Lmax) – TA75Lmax is the total time, normally in a given day, that exceeds 75 dBA. TA75Lmax accounts for the total combined time individual acoustic events, such as aircraft overflights, exceed the threshold for speech interference within an exposed building with its windows closed.
- Sound Exposure Level (SEL) – SEL is a measure of the total energy of an acoustic event. It represents the level of a 1-second-long constant sound that would generate the same energy as the actual time-varying noise event such as an aircraft overflight. SEL provides a measure of the net effect of a single acoustic event, but it does not directly represent the sound level at any given time.
- Number of events above 90 dBA SEL (NA90SEL) – NA90SEL is the total number of events that exceed 90 dBA SEL. NA90SEL accounts for both events short in duration and loud, and events longer in duration, but not as loud. As such, NA90SEL correlates well with the probability of sleep awakenings in a given population exposed to intermittent aircraft overflights.
- DNL – DNL is the average sound energy in a 24-hour period with an adjustment added to the nighttime levels. Due to the potential to be particularly intrusive, noise events occurring between 10:00 p.m. and 7:00 a.m. are assessed a 10 dB adjustment when calculating DNL. DNL is a useful descriptor for aircraft noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour

period. DNL provides a measure of the overall acoustical environment, but as with SEL, it does not directly represent the sound level at any given time. For well-distributed sound, L_{eq} is approximately 6.4 dBA lower than DNL.

- 24-Hour Equivalent Sound Level (Leq(24)) – Leq(24) is the average overall sound level for a 24-hour period. Leq(24) is equal to DNL for the same period without an adjustment for nighttime activities. Leq(24) correlates well with, and was used to assess, the potential for long-term hearing loss for individuals living on and around air installations and airports.

Regulatory Review and Land Use Planning. The Noise Control Act of 1972 directs federal agencies to comply with applicable federal, state, and local noise control regulations. The Noise Control Act specifically exempts aircraft operations and military training activities from state and local noise ordinances. There are no federal, state, or local noise regulations directly applicable to the Proposed Action. The Air Force Handbook (AFH) 32-7084, *Air Installations Compatible Use Zones (AICUZ) Program Manager's Guide* denotes that land use guidelines for noise exposure at military airfields are provided in DoD Instruction 4165.57, *Air Installations Compatible Use Zones* (AICUZ), Appendix 3C. **Table 3-16** provides a general overview of recommended noise limits from aircraft operations for land use planning purposes.

Table 3-16. Recommended Noise Limits for Land Use Planning

General Level of Noise	Percent Highly Annoyed	Aircraft Noise (DNL)	General Recommended Uses
Low	<12%	< 65 dBA	Noise-sensitive land uses acceptable
Moderate	12%–36%	65–75 dBA	Noise-sensitive land uses normally not recommended
High	>36%	> 75 dBA	Noise-sensitive land uses not recommended

Source: DAF 2015

3.2.2 Affected Environment

3.2.2.1 JBSA-Randolph, Seguin AAF, and JBSA-Lackland

This section outlines background noise, baseline aircraft noise, and noise abatement procedures at JBSA-Randolph, Seguin AAF, and JBSA-Lackland. A general overview of noise, a regulatory review, and a discussion of land use planning and aircraft noise is provided in **Section 3.2.1**.

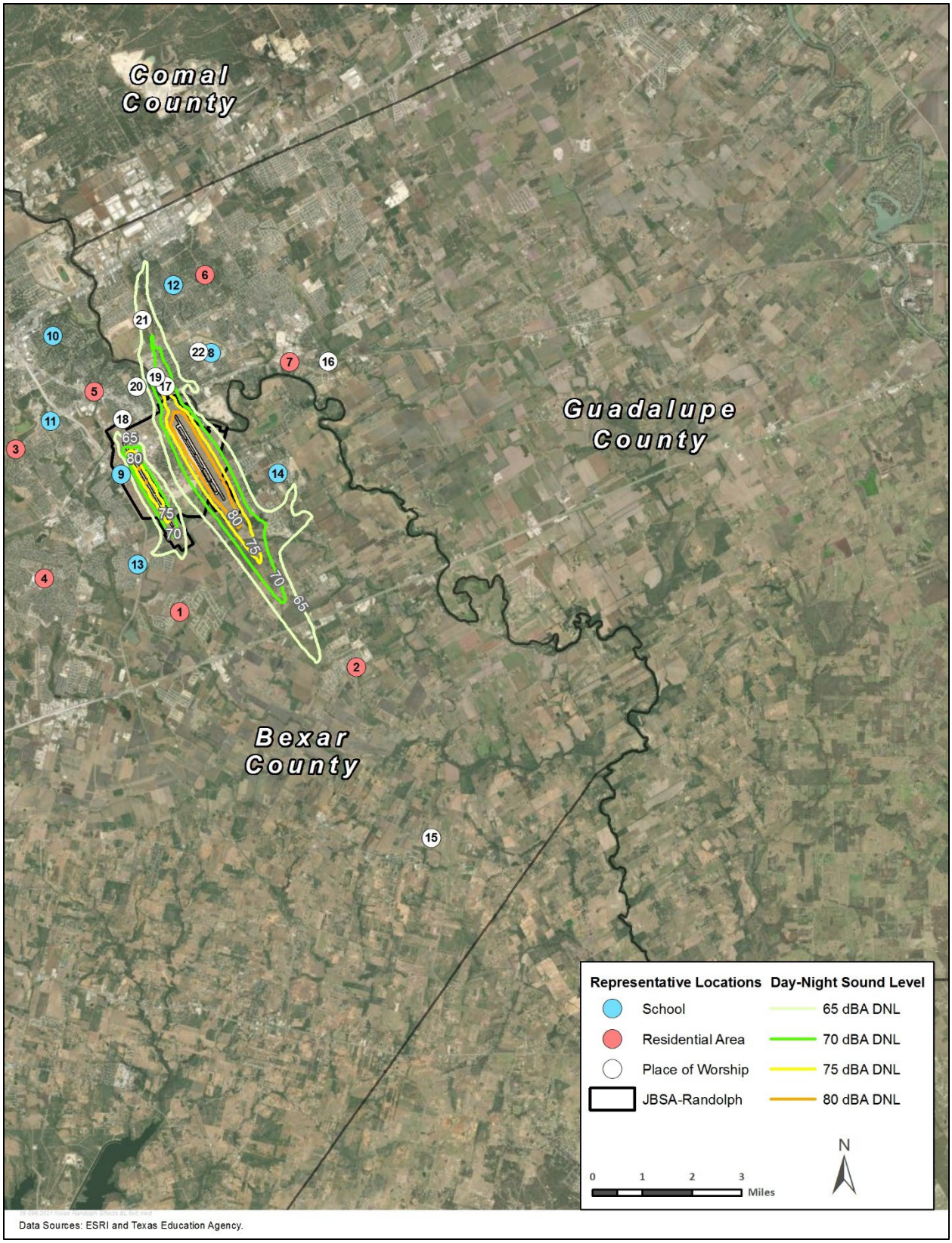
3.2.2.1.1 Overall Aircraft Noise

The existing mission and aircraft operations at JBSA-Randolph and Seguin AAF are described in **Section 2.1.2**. DAF adopted the NOISEMAP[8] computer program to describe noise effects from aircraft operations. NOISEMAP is a suite of computer programs and components developed by DAF to predict noise exposure in the vicinity of an airfield due to aircraft flight, maintenance, and ground run-up operations. NOISEMAP Version 7.3 was used to calculate the existing DNL noise contours at JBSA-Randolph and Seguin AAF.

Figure 3-1 and **Figure 3-2** show the existing DNL noise contours plotted in 5 dB increments, ranging from 65 to 80 dBA DNL at JBSA-Randolph and Seguin AAF. The noise contours, as shown, depict 2017 operational conditions as outlined in the JBSA-Randolph AICUZ Study. There have been no substantial changes in operations or mission at the installation since the noise contours were developed and have been carried forward as a comparative baseline to determine the level of effects under NEPA. The existing 65 dBA DNL noise contour at JBSA-Randolph extends approximately 3 miles from the northern end and 4 miles from the southern end of runway 15L/33R, and 0.5 mile from both ends of runway 15R/33L. The existing 65 dBA DNL noise contour at Seguin AAF extends approximately 1 mile from both ends of the runway. The 65 dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations.

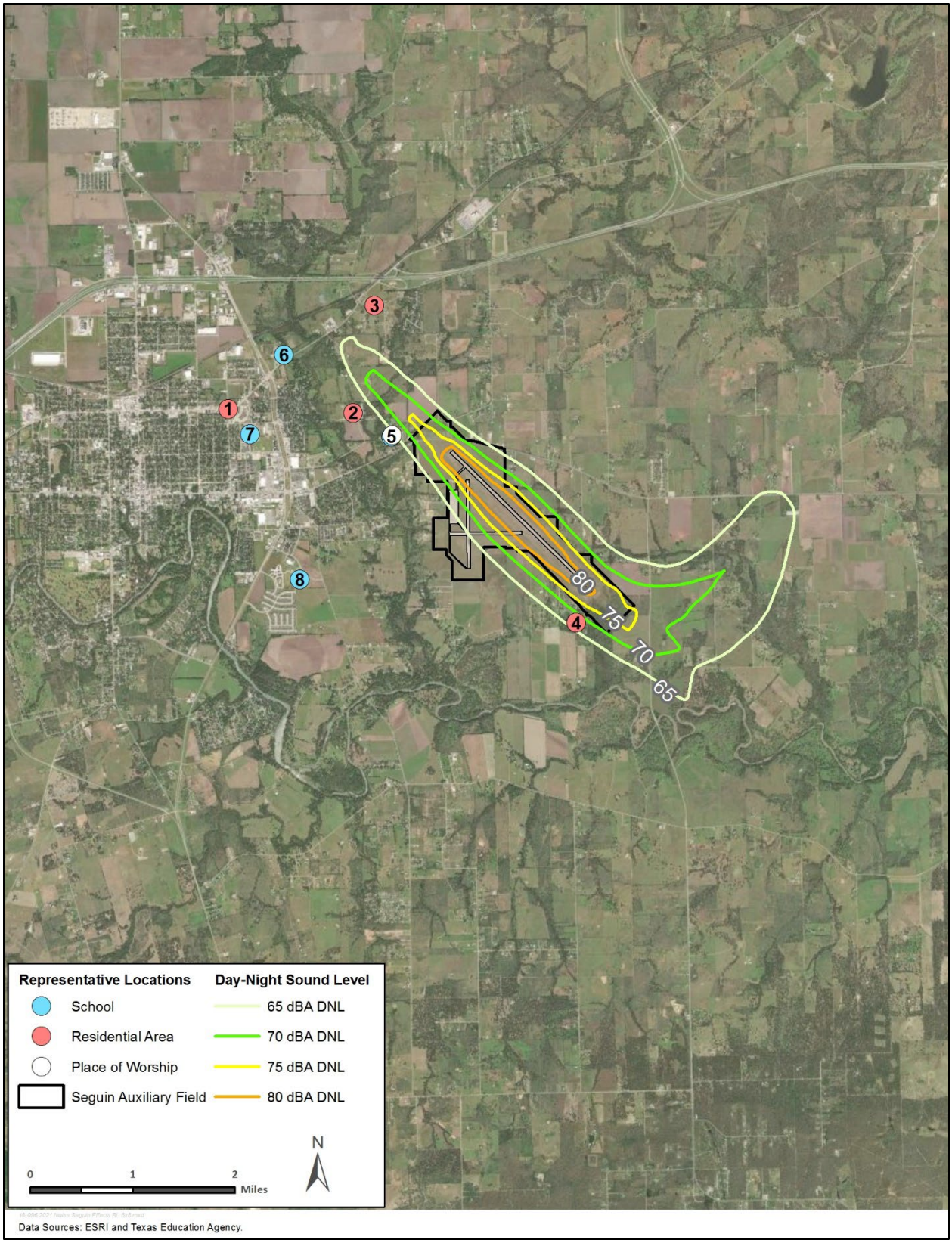
It should be emphasized that these noise levels, which are often shown graphically as contours on maps, are not discrete lines that sharply divide louder areas from land largely unaffected by noise. Instead, they are part of a planning tool that depicts the general noise environment around the installation based on typical aviation activities. Areas beyond 65 dBA DNL can also experience levels of appreciable noise depending upon training intensity or weather conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational tempo due to unit deployments, funding levels, and other factors.

[8] The Department of the Navy submitted a report to Congress in November 2021 that addresses the accuracy of the NOISEMAP modeling results versus real-time aircraft sound monitoring. The report concluded that the DoD approved noise models operate as intended and provide an accurate prediction of noise exposure levels from aircraft operations for use in impact assessments and long-term land use planning (DON 2021). This report is available to view on the project website at www.jbsa.T-7ANEPAdocuments.com.



Source: DAF 2020b

Figure 3-1. Noise Contours for JBSA-Randolph – Existing Conditions (2017)



Source: DAF 2020b

Figure 3-2. Noise Contours for Seguin AAF – Existing Conditions (2017)

Table 3-17 presents the existing land acreage and estimated residents exposed to noise levels 65 dBA DNL or greater. There are 3,065 acres and 5,083 residents off-installation, and 2,092 acres and 853 residents on-installation that are within the 65 dBA DNL contour at JBSA-Randolph. There are 2,002 acres and 417 residents off-installation and 824 acres and 170 residents on-installation that are within the 65 dBA DNL contour at Seguin AAF. The estimated residents are based on the percent area within individual census blocks, which is the smallest available georeferenced population dataset.

Table 3-17. Area and Estimated Population within Noise Contours at JBSA-Randolph and Seguin AAF – Existing Conditions

Noise Contour (dBA DNL)	Area Under Contours (Acres)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
65-70	687	2,092	2,778	122	1,451	1,573
70-75	499	731	1,229	180	508	688
75-80	444	192	637	272	43	314
>80	482	22	503	252	0	252
Total	**2,111**	**3,036**	**5,148**	**824**	**2,002**	**2,826**

Noise Contour (dBA DNL)	Estimated Population (Individuals)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
65–70	278	3,359	3,637	25	302	327
70–75	192	1,563	1,755	37	106	143
75–80	187	149	336	56	9	65
>80	196	12	208	52	0	52
Total	**853**	**5,083**	**5,936**	**170**	**417**	**587**

Note: Estimated population based on area within individual census blocks.
Sources: DAF 2020b and U.S. Census Bureau 2018

An examination of representative locations (i.e., residential areas, schools, and places of worship) was conducted to better describe the noise levels and associated effects surrounding the installations. Centralized intersections within residential areas were identified to provide a reasonable guide to the sound levels and effects for adjacent residences and neighborhoods. Representative schools and places of worship were chosen based on their potential to be exposed to aircraft noise and their relative positions around the installations. **Table 3-18** lists the existing overall sound levels (i.e., DNL) for 22 representative locations around JBSA-Randolph and nine around Seguin AAF. Three representative places of worship near JBSA-Randolph and one representative residential area near Seguin AAF are exposed to overall sound levels greater than 65 dBA DNL and are considered existing incompatible land uses (DAF 2017a). All other representative locations (i.e., residential areas, schools, and places of worship) at both installations are exposed to overall noise levels less than 65 dBA DNL.

Table 3-18. Overall Sound Level at Representative Locations – Existing Conditions

ID	Representative Location	Type	Overall Sound Level (dBA DNL)
JBSA-Randolph			
1	Boeing Drive and Graytown Road	Residential	54
2	FM1518 and Abbott Road	Residential	55
3	Kitty Hawk Road and Toepperwein Road	Residential	45
4	Seguin Road and Crestway Drive	Residential	45
5	Kitty Hawk Road and Pat Booker Road	Residential	57
6	Roy Richard Drive and Green Valley Road	Residential	49
7	FM78 and FM1103	Residential	46
8	Samuel Clemens High School	School	59
9	Randolph High School	School	59
10	Olympia Elementary School	School	56
11	Kitty Hawk Middle School	School	52
12	Laura Ingalls Wilder Intermediate School	School	54
13	Copperfield Elementary School	School	61
14	Ray D Corbett Junior High School	School	58
15	Hebron Church	Worship	56
16	Saint Paul Church	Worship	47
17	Resurrection Baptist Church	Worship	**74**
18	The Hanmi Presbyterian Church	Worship	57
19	Greater Randolph Seventh Day Adventist Church	Worship	**73**
20	Universal City United Methodist Church	Worship	59
21	Faith Apostolic Church	Worship	**68**
22	Church of Christ Schertz	Worship	60
Seguin AAF			
1	E Kingsbury Street and N King Street	Residential	41
2	Windbrook Subdivision	Residential	58
3	Sunbelt Road	Residential	62
4	Aux Airport Road and Oak Hill Drive	Residential	**67**
5	Southwest Preparatory School	School	63
6	Seguin Christian Academy	School	52
7	Seguin High School	School	43
8	Jim Barnes Middle School	School	40
9	Grace Family Bible Church	Worship	64

Source: DAF 2020b
Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.
Bolded sound levels indicate incompatible land uses.

JBSA-Lackland. There are approximately 69,904 air operations (i.e., single take-offs, landings, and patterns combined) at JBSA-Lackland each year, or 192 per day on average. Of these,

approximately 35,000 operations (50 percent) are C-5M military transports and 20,000 operations (30 percent) are F-16 fighter jets. Transient aircraft make up the remaining 15,000 operations, of which T-38C aircraft from JBSA-Randolph currently account for approximately 400 operations per year or about 1 operation per day (i.e., approximately 0.6 percent of the total operations) (DAF 2019). Two and one-half percent of the total operations (i.e., 1,748 operations per year) occur between 10 p.m. and 7 a.m.

The T-38C aircraft are substantially smaller and quieter than the F-16, which when combined with the C-5M operations dominate the noise at and surrounding the installation (DAF 2019). In general, it would take a 100 percent increase in air operations of similar aircraft to have even a barely perceptible effect on the noise environment (e.g. greater than 3 dBA); therefore, as the T-38C account for only 0.6 percent of the total operations, they do not contribute appreciably to the noise at JBSA-Lackland. The overall noise environment surrounding JBSA-Lackland is only incrementally dependent on the T-38C operations and would not be perceptibly different with or without them.

3.2.2.1.2 Individual Overflight Noise

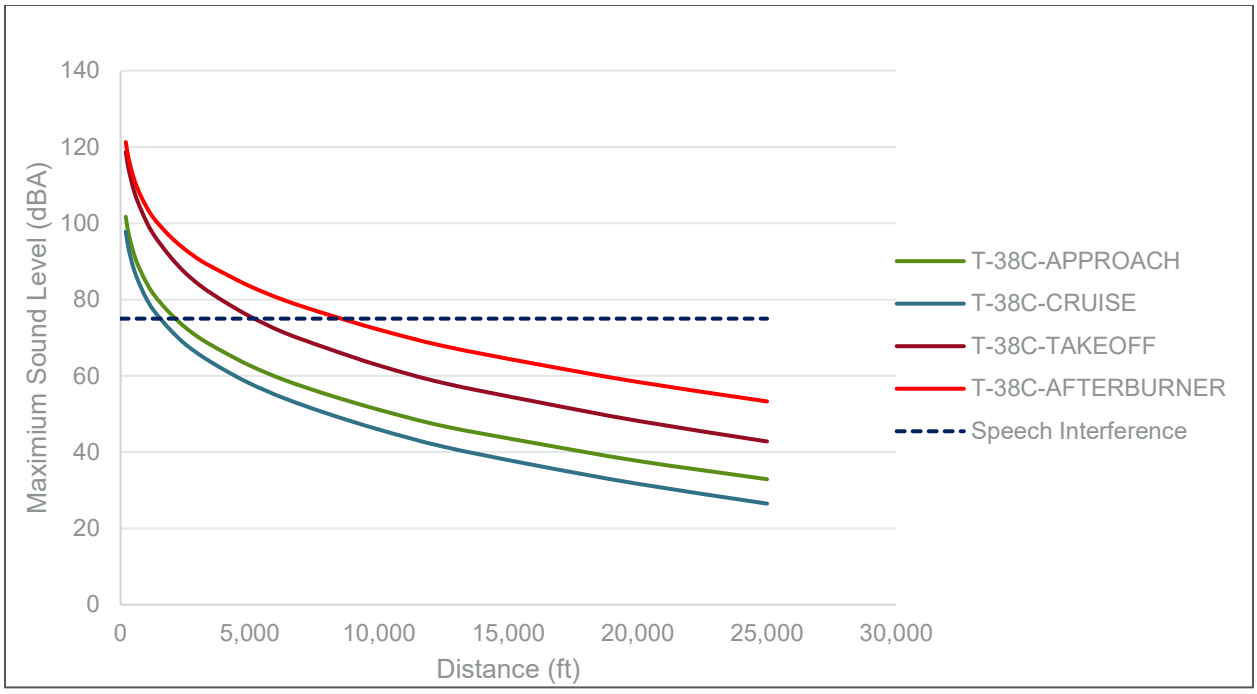
Table 3-19 and **Figure 3-3** and **Figure 3-4** outline the L_{max} and SEL for individual overflights of the T-38C in its primary operating modes. Individual overflights conducted at JBSA-Randolph and Seguin AAF are clearly audible, sometimes loud, to individuals who are outdoors, and clearly perceptible inside nearby buildings. An assessment of speech interference, damage to hearing, and damage to structures is provided below. Currently there are no nighttime (i.e., 10 p.m. to 7 a.m.) T-38C operations at either installation; therefore, sleep interference has not been carried forward for detailed assessment under the existing conditions.

Table 3-19. Estimated Sound Levels for Individual T-38C Overflights

	Sound Exposure Level (SEL) (dBA)			
Distance (feet)	**Approach**	**Cruise**	**Takeoff**	**Afterburner**
500	100	96	116	116
1,000	93	90	109	110
5,000	76	72	88	93
10,000	66	61	77	84
20,000	55	49	65	72

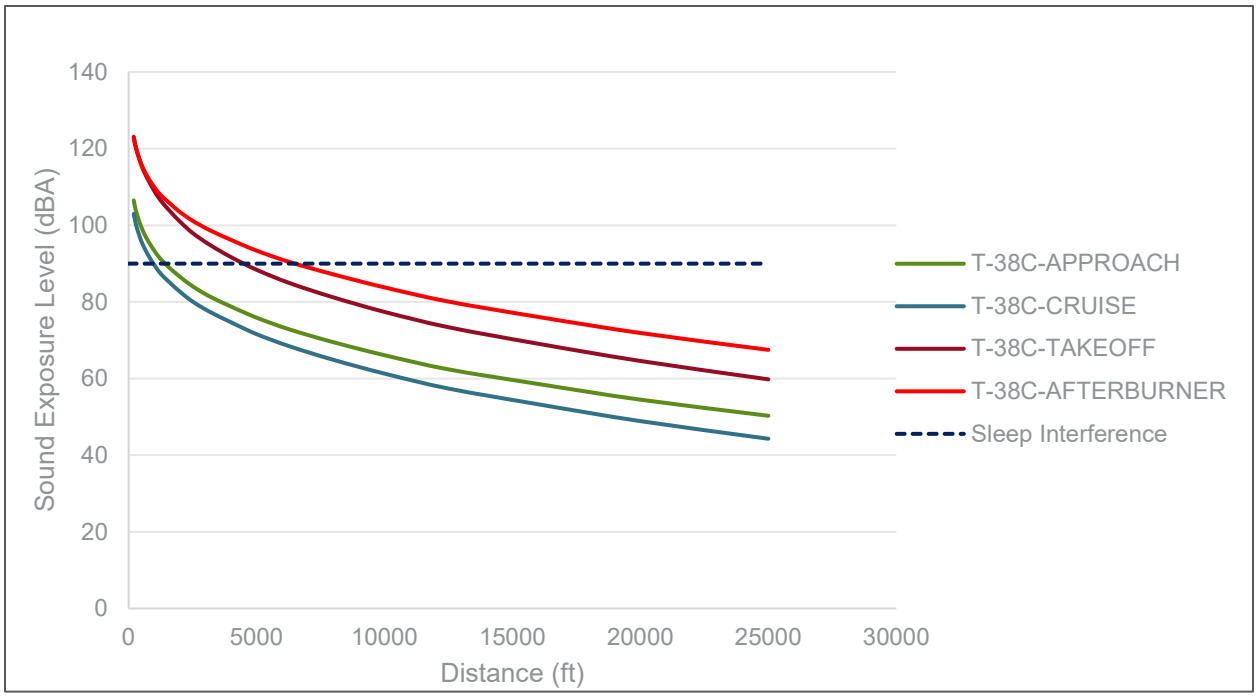
	Maximum Sound Level (L_{max}) (dBA)			
Distance (feet)	**Approach**	**Cruise**	**Takeoff**	**Afterburner**
500	92	88	109	112
1,000	84	80	100	104
5,000	63	58	76	84
10,000	51	46	63	72
20,000	38	32	48	58

Source: DAF 2020b
Notes: L_{max} is the maximum sound level during an individual overflight. SEL is the sound level if the entire overflight was compressed into one second and does not represent the actual noise at any given time.



Source: DAF 2020b

Figure 3-3. Maximum Sound Level vs. Distance for the T-38C



Source: DAF 2020b

Figure 3-4. Sound Exposure Level vs. Distance for the T-38C

Speech Interference. In general, individual overflights can interfere with communication on the ground, and in homes, schools or other buildings directly under their flight path. The disruption of routine activities in the home, such as radio or television listening, telephone use, or family conversation, can give rise to frustration and irritation. The quality of speech communication is also important in classrooms, and offices and can cause fatigue and vocal strain in those who attempt to communicate over the noise. The threshold which aircraft noise begins to interfere with communication is 50 dBA indoors, and speech interference is often described in terms of NA75Lmax and TA75Lmax outdoors to account for a 25 dBA of noise attenuation provided by buildings such as houses and schools (DNWG 2009a). A T-38C is loud enough to have the potential to interfere with speech on the ground when operating below 1,000 to 1,250 feet AGL in approach or cruise mode or below 4000 to 6,300 feet AGL in takeoff and afterburner modes.

This assessment examines the number of overflight events greater than 75 dBA outdoors (50 dBA indoors) for residential areas near JBSA-Randolph and Seguin AAF from 7 a.m. to 10 p.m. and for schools near the installations from 8 a.m. to 4 p.m. **Table 3-20** outlines the number of individual T-38C overflights above 50 dBA which are loud enough to interrupt communication inside within the representative residential areas and schools. The number of events loud enough to interfere with communication ranges from less than one to five events per hour for representative locations around JBSA-Randolph, and from less than one to three events per hour for representative locations around Seguin AAF. Other residential areas and schools in the immediate area of the installations would likely fall within this range. Figures depicting areas around the installations that experience some amount of speech interference are in **Appendix C**.

There are more than 40 schools within 5 miles of JBSA-Randolph, making classroom speech interference a particular concern; therefore, additional analysis was conducted to supplement the “number-of-events-above” analysis with a “time-above” assessment for representative schools. **Table 3-21** outlines the number of minutes on average that class time is above 50 dBA and has the potential to be interrupted by aircraft intrusions at the representative schools. The amount of time when aircraft would be loud enough to interfere with classroom communication ranges from less than 1 minute to 5 minutes for representative schools around JBSA-Randolph, and from less than 1 minute to 2 minutes for representative schools around Seguin AAF. Other schools in the immediate area of the installations would likely fall within this range. Figures depicting the amount of class time loud enough to interfere with speech for areas around the installations are in **Appendix C**.

Table 3-20. Events Loud Enough to Interfere with Speech – Existing Conditions

ID	Representative Location	Type	Number of Events Loud Enough to Interfere with Speech (events/hour)
	JBSA-Randolph		
1	Boeing Drive and Graytown Road	Residential	<1
2	FM1518 and Abbott Road	Residential	2
3	Kitty Hawk Road and Toepperwein Road	Residential	<1
4	Seguin Road and Crestway Drive	Residential	<1
5	Kitty Hawk Road and Pat Booker Road	Residential	5
6	Roy Richard Drive and Green Valley Road	Residential	<1
7	FM78 and FM1103	Residential	<1
8	Samuel Clemens High School	School	3
9	Randolph High School	School	<1
10	Olympia Elementary School	School	1
11	Kitty Hawk Middle School	School	<1
12	Laura Ingalls Wilder Intermediate School	School	<1
13	Copperfield Elementary School	School	5
14	Ray D Corbett Junior High School	School	5
	Seguin AAF		
1	E Kingsbury Street and N King Street	Residential	<1
2	Windbrook Subdivision	Residential	1
3	Sunbelt Road	Residential	1
4	Aux Airport Road and Oak Hill Drive	Residential	3
5	Southwest Preparatory School	School	1
6	Seguin Christian Academy	School	<1
7	Seguin High School	School	<1
8	Jim Barnes Middle School	School	<1

Sources: DAF 2020b and DNWG 2009a

Notes: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.

Residential areas assessed for a 15-hour day (7 a.m. to 10 p.m.) and schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Table 3-21. Class Time Loud Enough to Interfere with Speech – Existing Conditions

ID	Representative School	Time Loud Enough to Interfere with Classroom Communication (minutes/school day)
	JBSA-Randolph	
8	Samuel Clemens High School	2.8
9	Randolph High School	<1.0
10	Olympia Elementary School	1.5
11	Kitty Hawk Middle School	<1.0
12	Laura Ingalls Wilder Intermediate School	<1.0
13	Copperfield Elementary School	4.6
14	Ray D Corbett Junior High School	4.7
	Seguin AAF	
5	Southwest Preparatory School	1.8
6	Seguin Christian Academy	<1.0
7	Seguin High School	<1.0
8	Jim Barnes Middle School	<1.0

Sources: DAF 2020b and DNWG 2009a
Note: Schools assessed for an 8-hour day (8:00 a.m. to 4:00 p.m.)

Potential for Hearing Loss. Potential for Hearing Loss (PHL) applies to people living in high noise environments where they can experience long-term (40 years) hearing effects. The threshold for assessing PHL is Leq(24) (i.e., the average sound levels over a 24-hour period) greater than 80 dBA. The effect of PHL is denoted by the number of people subject to Noise Induced Potential Hearing Loss within 1 dBA increments above 80 dBA Leq(24) (i.e., 80 to 81 dBA). There are currently no on- or off-installation residences or individuals at JBSA-Randolph or Seguin AAF that are exposed to Leq(24) levels greater than 80 dBA, and there is no PHL. In addition, the Occupational Safety and Health Administration (OSHA) and DAF have adopted a threshold of 140 dB instantaneous noise level as a threshold for short-term exposure that may induce hearing loss. As individual aircraft overflights at JBSA-Randolph and Seguin AAF are not supersonic, and do not generate sonic booms above 140 dB, no individuals are exposed to instantaneous sound levels loud enough to damage hearing.

Damage to Structures. Noise from low-level aircraft overflights can cause buildings under their flight path to vibrate, which the occupants experience as shaking of the structure and rattling of the windows. However, based on experimental data and models, noise and vibrations from subsonic aircraft overflights do not cause structural damage to buildings. An impact noise (i.e., blast noise or sonic boom) above 140 dB is required to generate sufficient energy to damage structures (Bureau of Mines 1980 and Siskind 1989). Individual overflights at JBSA-Randolph and Seguin AAF are not supersonic and do not generate sonic booms above 140 dB; therefore, there is no potential damage to structures.

3.2.2.2 Airspace

Aircraft operations within the MOAs, MTRs, and R-6312 produce a noise environment that is somewhat different from that around the installations. As with the installations, sound from aircraft's engines and air flowing over the airframe of subsonic aircraft is the primary source of noise within the airspaces; however, rather than regularly occurring operations, activity in the airspace is highly sporadic. Notably, there are no supersonic aircraft activities within the MOAs, MTRs, or R-6312.

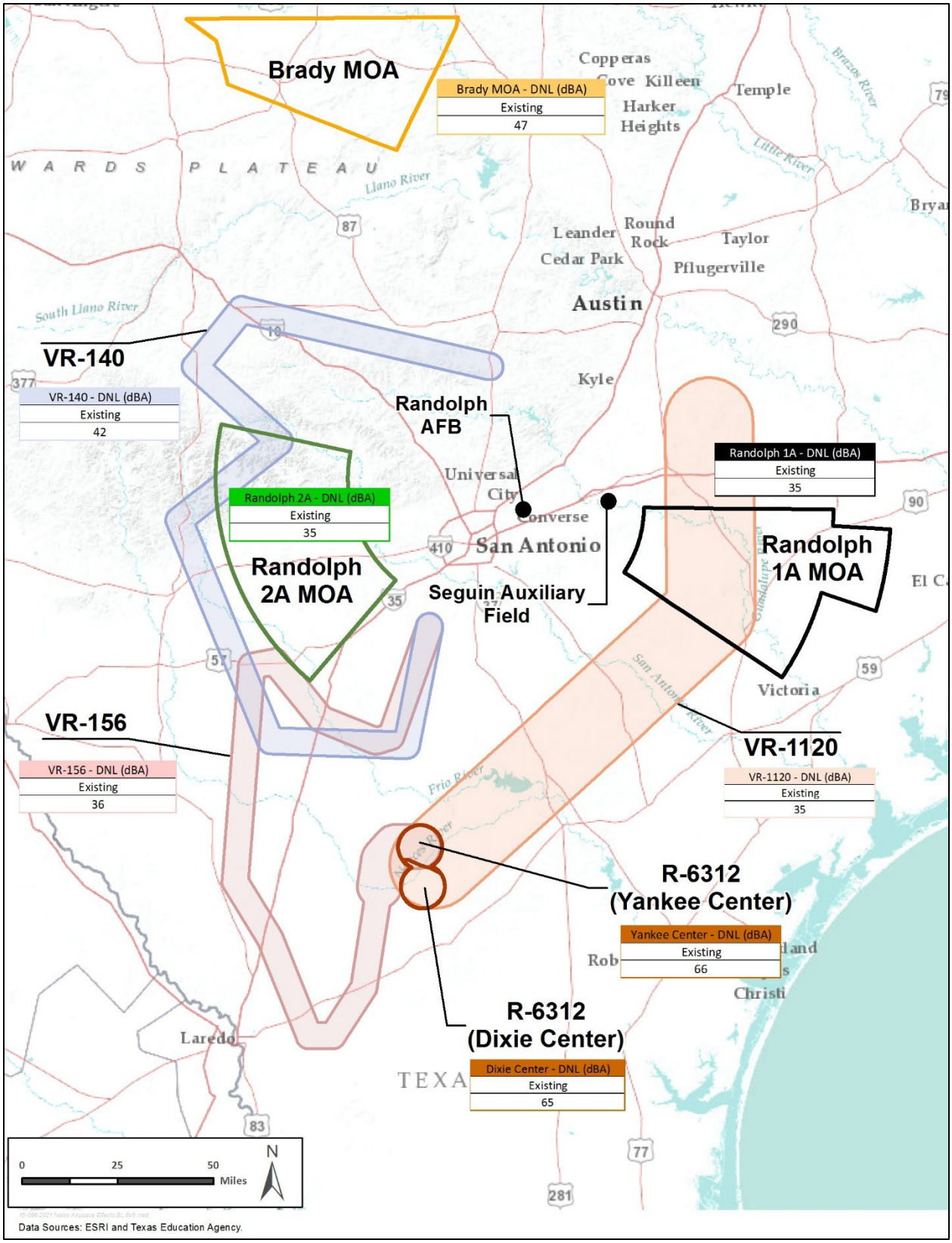
3.2.2.2.1 Overall Aircraft Noise

Table 3-22 and **Figure 3-5** show the existing overall sound levels (i.e., DNL) for areas beneath the MOAs, MTRs, and R-6312. The existing sound levels for all areas, other than R-6312, are less than 65 dBA DNL and compatible with all land uses. The existing overall sound levels at the ranges within R-6312 are greater than 65 dBA DNL and are normally incompatible with sensitive land uses. There are a limited number of residences within R-6312 near the ranges, and they are considered existing incompatible land uses (DAF 2017a).

Table 3-22. Overall Sound Levels Beneath the Airspace – Existing Conditions

Special Use Airspace	Altitudes	Overall Sound Level (dBA DNL)
Randolph 1A MOA	8,000'–17,999' MSL	35
Randolph 2A MOA	9,000'–17,999' MSL	35
Brady MOA	500' AGL–17,999' MSL	47
R-6312 (Dixie Center)	Surface–23,000' MSL	65
R-6312 (Yankee Center)	Surface–23,000' MSL	66
VR-1120	100'–1,500' AGL	35
VR-140	500'–4,500' AGL	42
VR-156	Surface–3,000' AGL	36

Source: DAF 2017a



Source: DAF 2020b

Figure 3-5. Overall Aircraft Noise in Special Use Airspace – Existing Conditions

3.2.2.2.2 Individual Aircraft Overflights

Although operational noise levels are too low to result in incompatibility with existing land uses, similar to those around the installations, noise from individual overflights generate distinct acoustical events. **Table 3-19** and **Figure 3-3** and **Figure 3-4** outline the L_{max} and SEL for individual overflights of the T-38C in its primary operating modes. Individual overflights conducted within the MOAs and along the MTRs are clearly audible, sometimes loud, to individuals who are outdoors, and clearly perceptible inside buildings below their flight path. An assessment of speech interference, PHL, and damage to hearing is provided as follows.

Speech Interference. A T-38C is loud enough to have the potential to interfere with speech on the ground when operating below 1,500 to 2,000 feet AGL in approach or cruise mode or below 5,000 to 8,000 feet AGL in takeoff and afterburner modes (**Figure 3-3**). T-38C operations within Randolph 1A and 2A MOAs are above these altitudes and are not normally loud enough to interfere with speech on the ground; whereas, T-38C operations in the Brady Low MOA, R-6312, and the MTRs operate below these altitudes and are normally loud enough to. The majority of the 6,792 sortie operations per year (18 per day) throughout the airspace would have flight components that would operate within the MTRs, the range, or within the Brady Low MOA, and would have some amount of speech interference for individuals below. These existing effects are distributed throughout areas beneath MOAs, MTRs, and R-6312 and some locations experience these events more often than others. As already outlined, these events are neither loud enough, nor frequent enough, to create areas of incompatible land use under the airspaces.

Potential for Hearing Loss. Leq(24) is equivalent to DNL without the 10 dB adjustment for nighttime events; therefore, it is always less than DNL for the same activities. Existing aircraft activity in the MOAs and the MTRs is not sufficient to generate DNL greater than 80 dBA; as such, is not sufficient to generate Leq(24) greater that 80 dBA, and there is no potential for hearing loss for individuals beneath these airspaces (DNWG 2013). In addition, OSHA and DAF have adopted 140 dB instantaneous noise level as a threshold for short-term exposure that may induce hearing loss. As individual aircraft overflights within the MOAs, MTRs, and R-6312 are not supersonic, and do not generate sonic booms above 140 dB, no individuals are susceptible to hearing loss.

Damage to Structures. Noise from low-level aircraft overflights can cause buildings under their flight path to vibrate, which the occupants experience as shaking of the structure and rattling of the windows. However, based on experimental data and models, noise and vibrations from subsonic aircraft overflights do not cause structural damage to buildings. DAF has adopted 140 dB instantaneous noise level as a threshold for short-term exposure (i.e., sonic booms) that may cause damage to structure, such as window breakage and plaster cracking. As individual aircraft overflights within the MOAs, MTRs, and R-6312 are not supersonic, and do not generate sonic booms above 140 dB, there would be no potential for damaging structures beneath them.

3.2.2.3 Existing Noise Abatement Procedures.

This section provides an overview of the existing noise abatement procedures and strategies that have primarily been developed through the installation's AICUZ program and the communities' Joint Land Use Study (JLUS).

AICUZ. JBSA-Randolph has an active AICUZ program that informs the public about its aircraft noise environment and recommends specific actions for the local jurisdictions with planning and zoning authority that can enhance the health, safety, and welfare of those living near JBSA-Randolph and Seguin AAF. To implement the AICUZ program, the installation is required to take the following actions:

- Prepare periodic AICUZ updates to quantify aircraft noise zones areas and provide compatible land use recommendations to local municipalities.
- Develop a prospective long-term (5 to 10 years) analysis and develop a strategy to promote compatible development in the community to address future changes.
- Coordinate with federal, state, and local agencies and community leaders in order to maintain public awareness of the AICUZ program.
- Promote encroachment partnering projects in order to achieve long-term encroachment protection.

The current version of the AICUZ plan for JBSA-Randolph and Seguin AAF was published in 2017, and it is considered a current noise-mitigation measure that describes the DAF's recommendation for compatible land use (DAF 2015). The 2017 AICUZ Update for JBSA-Randolph was used by Bexar and Guadalupe Counties to guide their current land-use management practices.

As outlined in the AICUZ plan, DAF strives to be a good neighbor and actively pursues operational measures to minimize aircraft noise. Noise abatement procedures apply to flight operations, as well as to engine run-up and maintenance operations conducted on the installation. To the greatest extent possible, flights are routed over sparsely populated areas to reduce the exposure to noise. Through DAF regulations, commanders are required to periodically review existing traffic patterns, instrument approaches, weather constrictions, and operating practices in relation to populated areas and other local situations. The JBSA-Randolph In-flight Guides provide detailed noise abatement procedures for departures, patterns, and arrivals, including the following:

- Commanders brief flight crews (pilots and ground maintenance) before each flight on the existing patterns designed to minimize disruption to the communities and the need to maintain the patterns.
- Pilots avoid noise-sensitive areas for low-level routes and avoid airspace conflicts with flight operations from San Antonio International Airport.
- Pilots and maintenance crew conduct high-power turns, to the extent possible, between the hours of 7 a.m. and 7 p.m., Monday through Friday, and between 1 p.m. and 4 p.m. on Sundays.

At Seguin AAF, the flight tracks were designed to avoid overflying the City of Seguin.

In addition to the abatement measures outlined above, all noise complaints are evaluated to ensure that future operations, where possible, do not generate unacceptable noise, and that the results from noise investigations are provided back to the complainant as soon as practical.

The Public Affairs Officer informs local officials about upcoming events and post notifications on the base website.

JLUS. Whereas the AICUZ plan represents DAF's compatible land use recommendations to the community, a JLUS is a community-developed document. The community-led JLUS encourages collaborative planning and communication while encouraging compatible development near military installations as those communities adjoining military installations experience growth. In 2015, Bexar County completed a JLUS in collaboration with DAF and the communities surrounding JBSA-Randolph and Seguin AAF, and with financial support from the Department of Defense's Office of Economic Adjustment. The JLUS included the follow strategies to less the overall effects from both encroachment of the installations, as well as any changes in aircraft noise:

- Amend the municipal codes and update comprehensive plans to establish a Military Influence Area Overlay District which would include a Noise Military Influence Area Subzones around both JBSA-Randolph and Seguin AAF. This subzone would include all land located off installation within the 65 dBA DNL noise contours for the installations, and residential development and other noise sensitive land uses within the zone may be subject to sound attenuation measures to reduce noise impacts (County of Bexar 2015).

- Develop a Memorandum of Understanding (MOU) with school districts surrounding JBSA-Randolph and Seguin AAF to coordinate on all future school master plans to prevent schools from being planned in noise sensitive and safety areas of the Noise and Safety Subzones.

- Adopt Statewide Building Code Requirements Incorporating Sound Attenuation Measures Jurisdictions should adopt building code requirements for new construction within the Noise Military Influence Area Subzone that requires attenuation measures to meet the guidelines.

- Prepare educational materials on sound attenuation methods using modified DoD or FAA sound attenuation educational materials as a supplemental educational document that describes building techniques which can be used to achieve 45 dBA DNL indoors.

- Amend municipal codes, building codes, and zoning ordinances to incorporate land use guidelines and sound attenuation measures to achieve 45 dBA DNL for interior noise for all new construction and for renovations where more than 50 percent of the structure is renovated within the 65 dBA DNL noise contour.

- The cities should design, develop, and place signage in community-wide rights-of-way to notify citizens that the community is shared with JBSA-Randolph and subject to potential impacts of overflight noise.

- Develop a sound attenuation program for willing property/homeowners supporting the Statewide Energy Code.

- Assess the viability of the dedication of avigation/noise easements for new development projects requiring discretionary development approvals. Avigation easements confer the

right to aircraft overflight and to generate impacts associated with normal aircraft operation such as noise, vibration, odor, air currents, illumination, and fuel consumption.

- Require avigation/noise easements and a note on the plat of the avigation easement for new development projects requiring discretionary development approvals.

3.2.3 Environmental Consequences

This section discusses noise from construction, noise from aircraft, potential changes to land use compatibility, and potential noise effects to humans due to implementing the Proposed Action and the three action alternatives. Changes in noise would be considered significant if they would (1) lead to a violation of any federal, state, or local noise ordinance; (2) substantially increase areas of incompatible land use outside the installations; or (3) have the potential to cause permanent hearing loss to nearby residents.

The existing and proposed aircraft operations at JBSA-Randolph, Seguin AAF, and throughout the special use airspace are described in **Section 2.1.2**. A general overview of noise, a regulatory review, and a discussion of land use planning and aircraft noise is provided in **Section 3.2.1**. A discussion of the effects of noise on wildlife is in **Section 3.3.3** and a discussion of the effects of noise on land use is **Section 3.5**.

The noise contours developed in this EIS are based on the best available information at this time. T-7A flight tracks, altitudes, and power settings were assumed to be the same as the T-38C operations. The T-7A aircraft has distinctly different operating characteristics than the T-38C, and as it becomes introduced to the installations, DAF would determine the safest, most efficient, and least intrusive flight operations for T-7A training at JBSA-Randolph, Seguin AAF, and JBSA-Lackland. Once the T-7A aircraft would begin to arrive at JBSA-Randolph, DAF would (1) analyze T-7A flying patterns and operational settings, (2) update the installation's AICUZ plan, and (3) support the community in developing a Joint Land Use Study for the installation and surrounding community. These actions would allow for more accurately predicting noise surrounding the installations and developing noise-specific mitigation measures. **Appendix D** addresses the use of the best available information and discusses the implementation of an adaptive management strategy to collect, develop, and model new data as it becomes available to provide a more accurate noise impact analysis and develop appropriate mitigation.

3.2.3.1 Proposed Action

The Proposed Action would have short-term, minor and long-term, significant, adverse effects on the noise environment. Short-term effects would be due to noise generated by heavy equipment during construction and demolition. Long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training and maintenance operations at JBSA-Randolph and Seguin AAF, and the introduction of operations between 10 p.m. and 7 a.m. Long-term changes in operational noise would substantially increase areas of incompatible land use on and adjacent to JBSA-Randolph and Seguin AAF. Due to the limited number of operations, changes in noise at JBSA-Lackland would be negligible.

3.2.3.1.1 JBSA-Randolph, Seguin AAF, and JBSA-Lackland

3.2.3.1.1.1 Construction Noise

Construction and demolition would require use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3-23** presents typical noise levels (dBA at 50 feet) for the main phases of outdoor construction. Individual pieces of heavy equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (U.S. Census Bureau 2018 and DAF 2020b). With multiple items of equipment operating concurrently, noise levels can be high within several hundred feet of active construction and demolition sites.

Table 3-23. Noise Levels Associated with Outdoor Construction

Construction Phase	L_{eq} (dBA)
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Sources: USEPA 1971 and FHWA 2006

All construction and demolition in support of the Proposed Action would be within the JBSA-Randolph property boundary, collocated with other existing noise-compatible activities, and end with the facility construction and modification phase. Some people living or working near the sites may notice or be annoyed by the noise. There would be no construction or associated noise at Seguin AAF or JBSA-Lackland. Given the temporary nature of proposed construction and demolition activities, distance to off-base noise sensitive areas, and the existing noise environment, these effects would be minor. Although construction-related noise effects would be minor, the following best management practices (BMPs) would be performed to further reduce any realized noise effects:

- Heavy equipment use would primarily occur during normal weekday business hours in areas adjacent to noise sensitive land uses such as residential areas
- Heavy equipment mufflers would be properly maintained and in good working order
- Personnel, particularly equipment operators, would don adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.

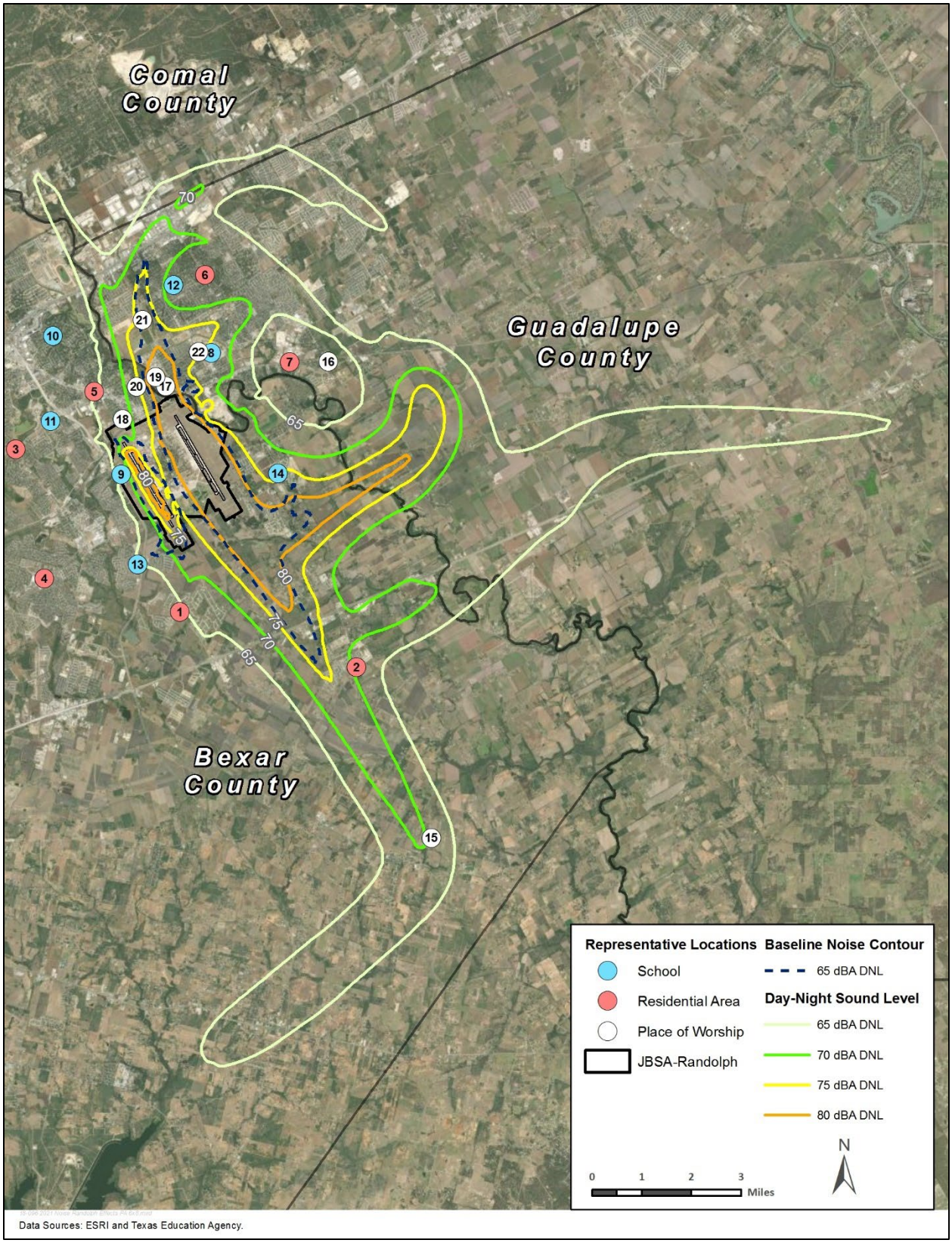
3.2.3.1.1.2 Overall Aircraft Noise

Noise levels on and adjacent to JBSA-Randolph and Seguin AAF with the proposed T-7A aircraft were calculated based on full implementation of the Proposed Action in 2032. **Figure 3-6** and **Figure 3-7** show the modeled DNL noise contours with and without the T-7A conversion. **Table 3-24** presents the land acreage and estimated population exposed to noise levels 65 dBA DNL or greater at JBSA-Randolph and Seguin AAF with the full implementation of the Proposed Action. With the implementation of the Proposed Action, the overall noise (i.e., DNL) surrounding JBSA-Randolph and Seguin AAF would increase appreciably. This would be primarily due to the introduction of the louder T-7A, a substantially louder aircraft than the T-38C. A comparison of individual T-7A and T-38C overflights and their effects is provided in **Section 3.2.3.1.2**. In addition, there would be an increase in the number of operations at JBSA-Randolph, Seguin AAF, and JBSA-Lackland, and the introduction of nighttime air operations at JBSA-Randolph.

The T-7A aircraft are proposed for arrival and immediate use beginning in 2023. The increase in T-7A aircraft and associated training operations would be incremental through 2028, as shown in **Table 2-1**. In 2028, the full complement of T-7A aircraft would arrive at JBSA-Randolph and the number of T-7A aircraft operations would stabilize to the full rate of the Proposed Action implementation in 2030. During the period of 2023 to 2030, the rate of increased area and population within the 65-dBA DNL contour would incrementally increase.

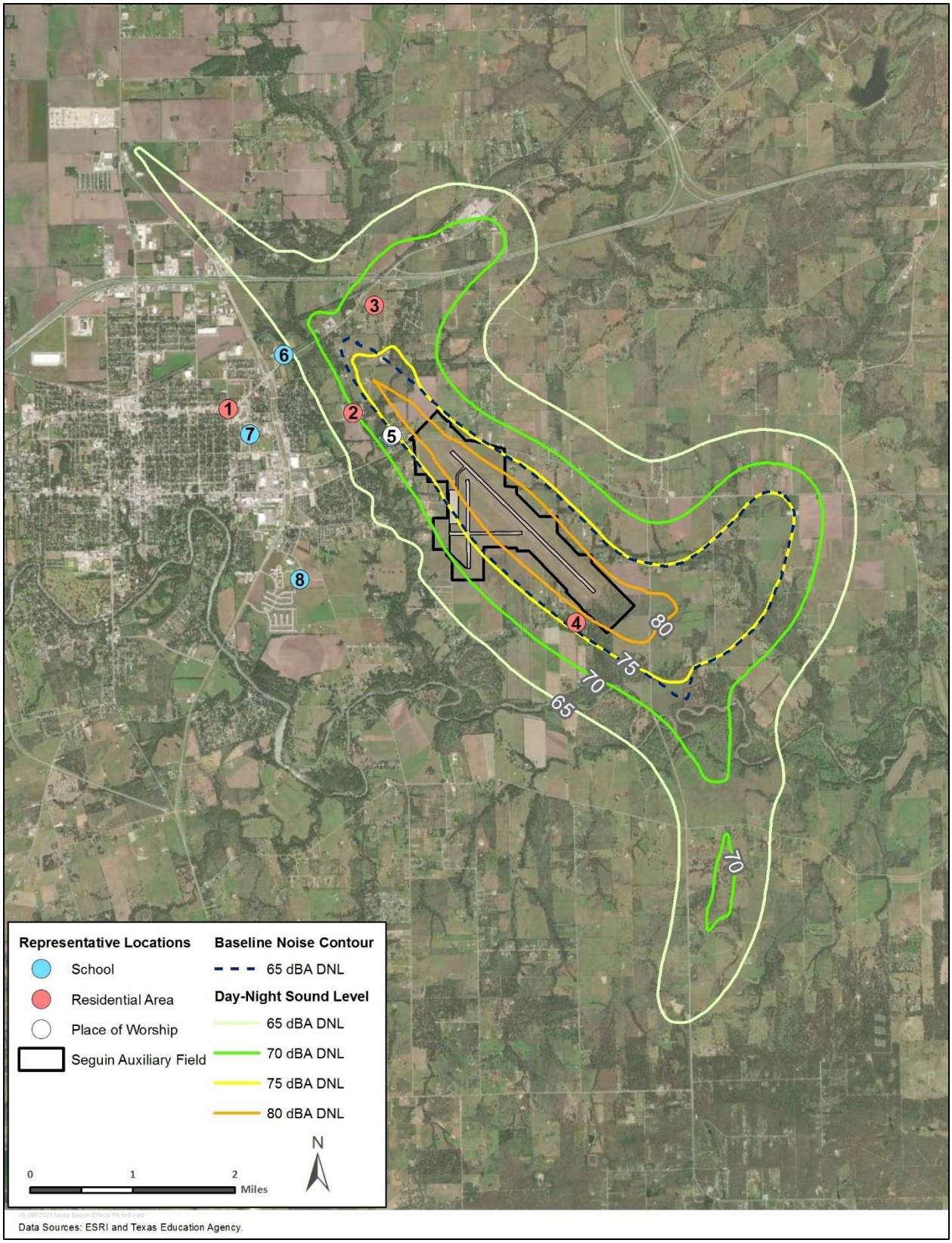
With improved avionics and advanced capabilities, the T-7A aircraft would be able to operate at any time of day or night. This would enable pilots to train in evening and nighttime operations which are not currently conducted with the T-38C aircraft at JBSA-Randolph. Currently, operations occur on an approximate dawn to dusk schedule for which hours vary throughout the year seasonally. The introduction of evening and nighttime flight operations from JBSA-Randolph would expand the hours of associated aircraft noise in the area. The community surrounding JBSA-Randolph would be exposed to evening and nighttime training operations of the T-7A. The evening hours are those that occur between dusk up to 10 p.m. Nighttime hours are defined as occurring between 10 p.m. and 7 a.m. Nighttime operations occurring at JBSA-Randolph would number approximately 5,664 annually. Due to the lack of runway lighting or in-place operational controls, Seguin AAF cannot be considered as an alternative location for after-dark or nighttime aircraft operations and therefore, no nighttime operations would be conducted at Seguin AAF. Introduction of the T-7A would increase nighttime operations at JBSA-Lackland by 288 per year or about 1 per night (i.e., 14 percent).

With full implementation of the Proposed Action (in 2032), the 65 dBA DNL noise contour at JBSA-Randolph would extend approximately 7 miles from the north end and 9 miles from the south end of runway 15L/33R, and 1 mile from both ends of runway 15R/33L. In addition, the 65 dBA DNL noise contours would extend as much as eight miles to the east of the runways. The 65 dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations. The 70, 75, and 80 dBA DNL noise contours would expand substantially to the north, south, and east of the runways. These areas would be exposed to frequent air operations that would be loud to very loud. These levels of noise (i.e., 70-80 dBA DNL) would include individual overflights both loud and frequent enough to highly annoy 22 to 55 percent of individuals within these areas.



Source: DAF 2020b

Figure 3-6. Noise Contours for JBSA-Randolph – Proposed Action



Source: DAF 2020b

Figure 3-7. Noise Contours for Seguin AAF – Proposed Action

Table 3-24. Areas and Estimated Population within Noise Contours – Proposed Action

Noise Contour (dBA DNL)	Area Under Contours (Acres)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	687	2,092	2,778	122	1,451	1,573
70–75	499	731	1,229	180	508	688
75–80	444	192	637	272	43	314
>80	482	22	503	252	0	252
Total	**2,111**	**3,036**	**5,148**	**824**	**2,002**	**2,826**
Proposed Action						
65–70	269	28,910	29,179	18	5,810	5,829
70–75	536	9,638	10,174	121	3,190	3,312
75–80	681	4,843	5,524	179	1,683	1,863
>80	1,426	2,557	3,983	647	310	957
Total	**2,913**	**45,948**	**48,861**	**966**	**10,994**	**11,960**
Change from Existing Conditions						
65–70	-415	29,666	29,252	-103	4,359	4,256
70–75	4	8,907	8,911	-58	2,682	2,624
75–80	282	4,657	4,939	-92	1,640	1,548
>80	932	2,524	3,456	395	310	705
Total	**804**	**45,753**	**46,557**	**142**	**8,991**	**9,133**

Noise Contour (dBA DNL)	Estimated Population (Individuals)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	278	3,359	3,637	25	302	327
70–75	192	1,563	1,755	37	106	143
75–80	187	149	336	56	9	65
>80	196	12	208	52	0	52
Total	**853**	**5,083**	**5,936**	**170**	**417**	**587**
Proposed Action						
65–70	137	36,617	36,754	4	1,608	1,612
70–75	490	13,704	14,194	25	640	665
75–80	275	7,288	7,563	37	350	387
>80	583	2,836	3,419	133	65	198
Total	**1,485**	**60,445**	**61,930**	**199**	**2,663**	**2,862**
Change from Existing Conditions						
65–70	-141	33,258	33,117	-21	1,306	1,285
70–75	298	12,141	12,439	-12	534	522
75–80	88	7,139	7,227	-19	341	322
>80	387	2,824	3,211	81	65	146
Total	**632**	**55,362**	**55,994**	**29**	**2,246**	**2,275**

Note: Estimated population based on area within individual census blocks at full implementation of the Proposed Action with the full complement of T-7A aircraft.
Sources: DAF 2020b and U.S. Census Bureau 2018

The proposed new hush house would be placed at the same location of the existing hush house adjacent to the taxiway near the northern end of runway 15L/33R. The orientation of the jet engine's exhaust from the proposed hush house is assumed to be consistent with the orientation of most hush houses where the exhaust is pointed skyward. Noise reduction from the operation of a hush house would be limited to, and expected to benefit, areas immediately adjacent to JBSA-Randolph.

The areas surrounding JBSA-Randolph exposed to 65 dBA DNL or greater would increase from 3,036 acres to 45,948 acres at full implementation of the Proposed Action. The additional 42,883 acres would not be in any one concentrated location but would constitute a significant expansion on all sides of the existing noise contours, expanding as far north as Northcliffe and as far south as Saint Hedwig. These newly exposed areas encompass numerous land uses including residential, commercial, as well as undeveloped and agricultural. Changes to the overall noise environment at and surrounding the installation would be appreciable and clearly louder than existing conditions. The estimated total number of residents affected by aircraft noise living within the expanded 65, 70, 75, and 80 dBA DNL contours around JBSA-Randolph would increase from 5,083 to 60,445. **Table 3-24** shows the estimated affected population for each contour. Within this same footprint, there are numerous schools and places of worship exposed to levels greater than 65 dBA DNL.

With full implementation of the Proposed Action, the 65 dBA DNL noise contour at Seguin AAF would extend approximately 5 miles to the north and 4 miles to the south of the runway. In addition, the 65 dBA DNL noise contour would extend 1 to 3 miles to the east and west of the runway. The 70, 75, and 80 dBA DNL noise contours would expand substantially to areas adjacent to the airfield.

At full implementation of the Proposed Action, the off-installation areas surrounding Seguin AAF exposed to 65 dBA DNL or greater would increase from 2,002 acres to 10,994 acres. The additional 8,991 acres would not be in any one concentrated location but would constitute a significant expansion on all sides of the existing noise contours. These newly exposed areas encompass numerous land uses, including residential and commercial, but are primarily undeveloped or agricultural. Changes to the overall noise environment at and surrounding the airfield would be appreciable and clearly louder than existing conditions.

Table 3-25 lists the overall sound levels (i.e., DNL) for 22 representative locations around JBSA-Randolph and nine around Seguin AAF with the implementation of the Proposed Action. The number of representative locations exposed to overall sound levels greater than 65 dBA DNL near JBSA-Randolph and Seguin AAF would increase from four to nineteen when compared to existing conditions. Fourteen out of the twenty-two representative locations near JBSA-Randolph would be exposed to overall sound levels greater than 65 dBA DNL, including two out of the seven residential areas, four out of the six schools, and seven of the eight places of worship. Five representative locations near Seguin AAF would be exposed to overall sound levels greater than 65 dBA DNL, including three of the four residential areas, one out of the four schools, and the place of worship. All other representative residential areas, schools, and places of worship at both installations would be exposed to overall noise levels less than 65 dBA DNL.

Table 3-25. Overall Sound Levels at Representative Locations – Proposed Action

JBSA-Randolph				
			Overall Sound Level (dBA DNL)	
ID	Representative Location	Type	Existing Conditions	Proposed Action
1	Boeing Drive and Graytown Road	Residential	54	64
2	FM1518 and Abbott Road	Residential	55	**69**
3	Kitty Hawk Road and Toepperwein Road	Residential	45	51
4	Seguin Road and Crestway Drive	Residential	45	51
5	Kitty Hawk Road and Pat Booker Road	Residential	57	65
6	Roy Richard Drive and Green Valley Road	Residential	49	**65**
7	FM78 and FM1103	Residential	46	64
8	Samuel Clemens High School	School	59	**74**
9	Randolph High School	School	59	**67**
10	Olympia Elementary School	School	56	**69**
11	Kitty Hawk Middle School	School	52	59
12	Laura Ingalls Wilder Intermediate School	School	54	**68**
13	Copperfield Elementary School	School	61	64
14	Ray D Corbett Junior High School	School	58	**74**
15	Hebron Church	Worship	56	**69**
16	Saint Paul Church	Worship	47	63
17	Resurrection Baptist Church	Worship	**74**	**85**
18	The Hanmi Presbyterian Church	Worship	57	**68**
19	Greater Randolph Seventh Day Adventist Church	Worship	**73**	**84**
20	Universal City United Methodist Church	Worship	59	**74**
21	Faith Apostolic Church	Worship	**68**	**77**
22	Church of Christ Schertz	Worship	60	**75**
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	54	55
2	Windbrook Subdivision	Residential	**68**	**70**
3	Sunbelt Road	Residential	**71**	**72**
4	Aux Airport Road and Oak Hill Drive	Residential	**76**	**77**
5	Southwest Preparatory School	School	**72**	**73**
6	Seguin Christian Academy	School	63	64
7	Seguin High School	School	55	56
8	Jim Barnes Middle School	School	53	54
9	Grace Family Bible Church	Worship	**73**	**74**

Source: DAF 2020b

Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.

Bolded sound levels indicate incompatible land uses.

JBSA-Lackland. With full implementation of the Proposed Action, T-7A aircraft from JBSA-Randolph would account for approximately 1,216 operations per year or about three operations per day at JBSA-Lackland (i.e., about 1.7 percent of the total operations) (DAF 2019). This would be 3 times greater than the number of existing T-38C operations conducted at JBSA-Lackland. The T-7A aircraft are smaller and somewhat quieter than the F-16, which when combined with the C-5M operations dominate the noise at and surrounding the installation (DAF 2019). In general, it would take a 100 percent increase in air operations of similar aircraft to have even a barely perceptible effect on the noise environment (e.g., greater than 3 dBA); therefore, as the T-7A would account for only 1.3 percent of the total operations, they would not contribute appreciably to the noise at JBSA-Lackland. The overall noise environment surrounding JBSA-Lackland would be only incrementally dependent on the T-7A operations and would not be perceptibly different with or without them.

3.2.3.1.1.3 Individual Overflight Noise

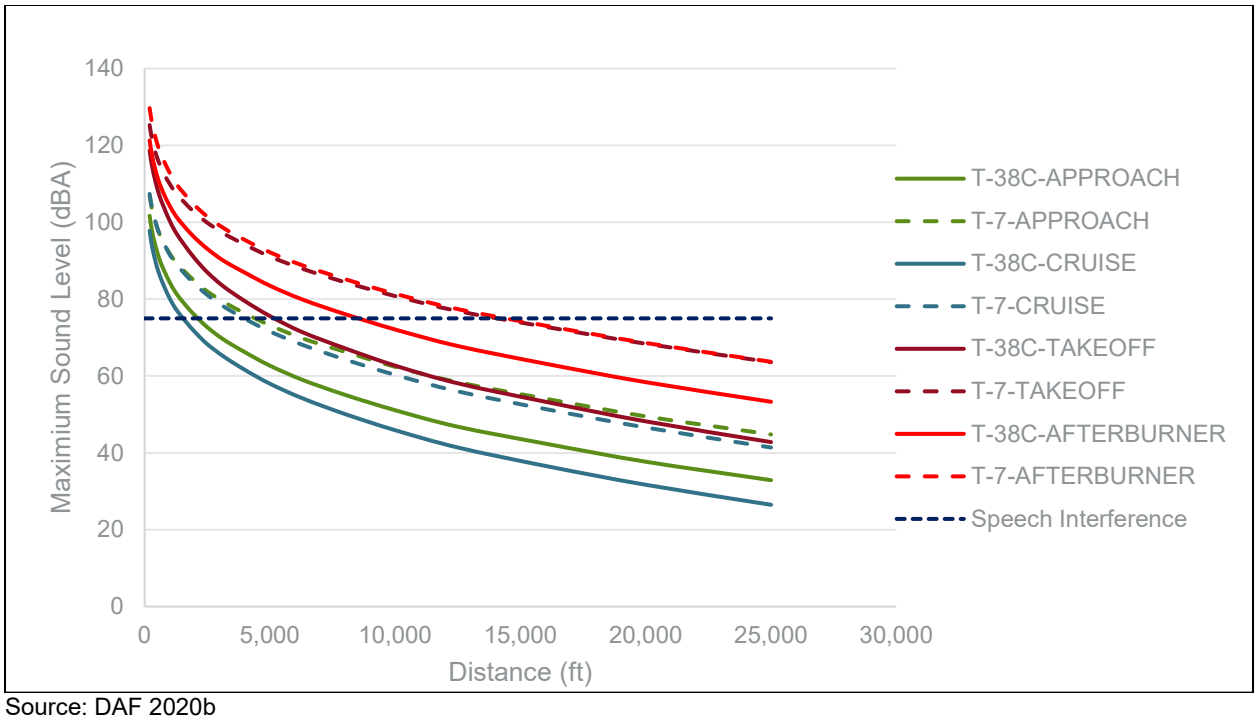
Table 3-26 and **Figure 3-8** and **Figure 3-9** outline the L_{max} and SEL for individual overflights of the T-38C and the T-7A in their primary operating modes. Individual T-7A overflights would be appreciably louder than T-38C overflights at all altitudes and in all operating modes, but particularly during takeoff. With a 5 to 10 dBA increase in sound levels, individual T-7A overflights would be perceived as a readily perceptible change in noise to twice as loud as T-38C overflights.

Table 3-26. Estimated Sound Levels for Individual T-38C and T-7A Overflights

Sound Exposure Level (SEL) (dBA)								
	Approach		Cruise		Takeoff		Afterburner	
Distance (feet)	T-38C	T-7A	T-38C	T-7A	T-38C	T-7A	T-38C	T-7A
500	100	102	96	104	116	122	116	125
1,000	93	98	90	99	109	117	110	119
5,000	76	83	72	83	88	103	93	102
10,000	66	74	61	74	77	94	84	93
20,000	55	63	49	62	65	83	72	82

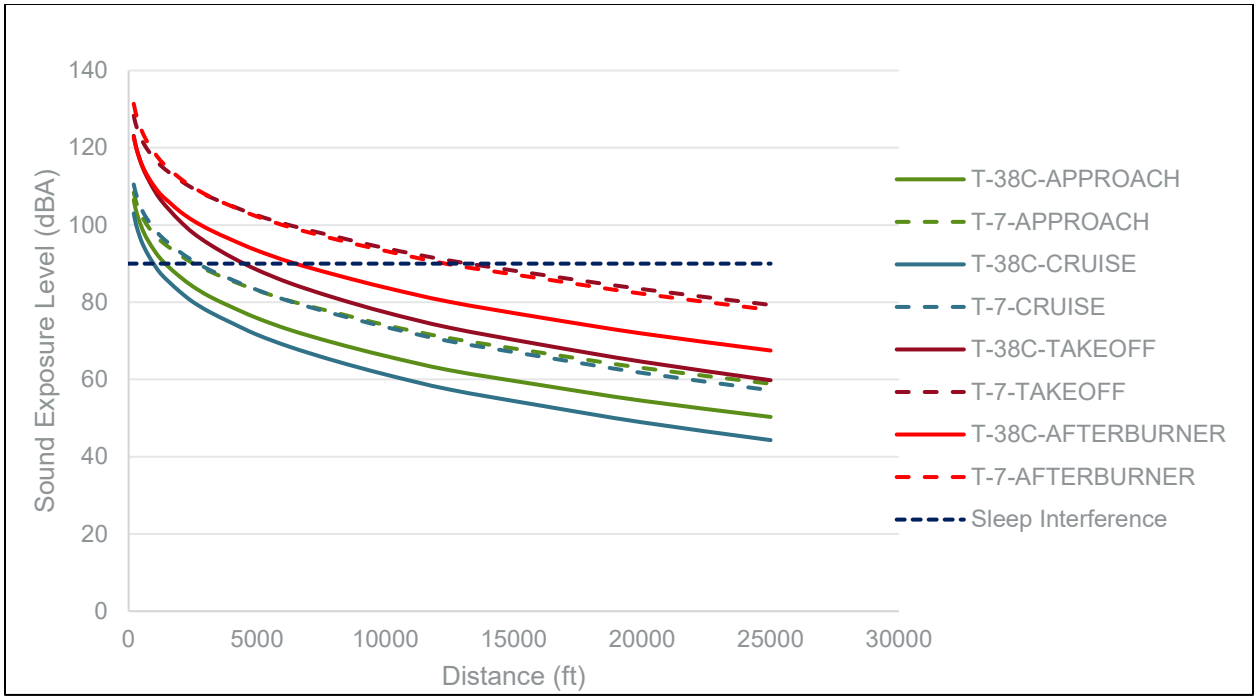
Maximum Sound Level (L_{max}) (dBA)								
	Approach		Cruise		Takeoff		Afterburner	
Distance (feet)	T-38C	T-7A	T-38C	T-7A	T-38C	T-7A	T-38C	T-7A
500	92	99	88	99	109	117	112	121
1,000	84	92	80	92	100	110	104	113
5,000	63	73	58	72	76	91	84	92
10,000	51	62	46	60	63	81	72	81
20,000	38	50	32	47	48	68	58	69

Source: DAF 2020b
Notes:
L_{max} is the maximum sound level during an individual overflight.
SEL is the sound level if the entire overflight was compressed into one second and does not represent the actual noise at any given time.



Source: DAF 2020b

Figure 3-8. Maximum Sound Level vs. Distance for the T-38C and T-7A



Source: DAF 2020b

Figure 3-9. Sound Exposure Level vs. Distance for the T-38C and T-7A

Individual overflights conducted at JBSA-Randolph and Seguin AAF would continue to be clearly audible, sometimes loud, to individuals who are outdoors, and clearly perceptible inside nearby buildings. T-7A overflights would incrementally increase as T-38Cs were phased out, and individual acoustical events would increase in duration, level, and frequency when compared to existing conditions. Effects from individual overflights would continue to be distributed throughout areas within and adjacent to the two installations. An assessment of speech interference is provided in the following paragraphs. Unlike existing conditions, with the implementation of the Proposed Action, approximately 5 percent of aircraft activities would be conducted between 10 p.m. and 7 a.m.; therefore, an assessment of their potential to interfere with sleep is provided. As with existing conditions, and for similar reasons, aircraft overflights would not generate individual acoustic events loud enough to damage structures.

Speech Interference. A T-7A would be loud enough to have the potential to interfere with speech on the ground when operating below 5,000 feet AGL in approach or cruise mode or below 13,000 feet AGL in takeoff and afterburner modes (**Figure 3-8**). With full implementation of the Proposed Action, there would be an average of 312 aircraft operations at JBSA-Randolph and 112 aircraft operations at Seguin AAF each day, all of which would operate for some amount of time below altitudes that could interfere with speech inside buildings on the ground. In general, a broader range of areas near the two bases would intermittently experience aircraft overflights that would range from loud to very loud exceeding 75 dBA L_{max} at any given point on the ground and interfere with communication for individuals beneath the aircrafts' flight paths.

Table 3-27 outlines the number of individual aircraft overflights above 50 dBA, which are loud enough to interrupt communication within the representative residential areas and schools with the implementation of the Proposed Action. The number of events loud enough to interfere with communication would increase in range to less than one to fourteen events per hour for representative locations around JBSA-Randolph, and from one to four events per hour for representative locations around Seguin AAF. Other residential areas and schools in the immediate area of the installations would likely fall within this range. Notably, locations with the highest number of events are directly under predominant flight paths to and from the installation. Figures depicting areas around the installations that would experience some amount of speech interference are in **Appendix C**.

Table 3-27. Number of Events Loud Enough to Interfere with Speech – Proposed Action

ID	Representative Location	Type	Number of Events Loud Enough to Interfere with Speech (events/hour)	
			Existing Conditions	Proposed Action
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	<1	6
2	FM1518 and Abbott Road	Residential	2	5
3	Kitty Hawk Road and Toepperwein Road	Residential	<1	1
4	Seguin Road and Crestway Drive	Residential	<1	<1
5	Kitty Hawk Road and Pat Booker Road	Residential	5	7
6	Roy Richard Drive and Green Valley Road	Residential	<1	2
7	FM78 and FM1103	Residential	<1	4
8	Samuel Clemens High School	School	3	12
9	Randolph High School	School	<1	10
10	Olympia Elementary School	School	1	2
11	Kitty Hawk Middle School	School	<1	1
12	Laura Ingalls Wilder Intermediate School	School	<1	5
13	Copperfield Elementary School	School	5	14
14	Ray D Corbett Junior High School	School	5	11
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	<1	1
2	Windbrook Subdivision	Residential	1	4
3	Sunbelt Road	Residential	1	2
4	Aux Airport Road and Oak Hill Drive	Residential	3	4
5	Southwest Preparatory School	School	1	4
6	Seguin Christian Academy	School	<1	3
7	Seguin High School	School	<1	1
8	Jim Barnes Middle School	School	<1	4

Sources: DAF 2020b and DNWG 2009a.
Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.
Residential areas assessed for a 15-hour day (7 a.m. to 10 p.m.) and schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Table 3-28 outlines the number of minutes on average that class time would be above 50 dBA and interrupted by aircraft intrusions at the representative schools with the implementation of the Proposed Action. The amount of time when aircraft would be loud enough to interfere with classroom communication would increase in range to between 2 and 44 minutes for representative schools around JBSA-Randolph, and to between 2 and 7 minutes for representative schools around Seguin AAF. Other schools in the immediate area of the installations would likely fall within this range. As with the number of events, locations with the longest time above the threshold for speech interference are directly under predominant flight paths to and from the installation. Figures depicting the amount of class time loud enough to interfere with speech for areas around the installations are in **Appendix C**.

Table 3-28. Class Time Loud Enough to Interfere with Speech – Proposed Action

ID	Representative School	Time Loud Enough to Interfere with Classroom Communication (minutes/school day)	
		Existing Conditions	Proposed Action
JBSA-Randolph			
8	Samuel Clemens High School	2.8	12.6
9	Randolph High School	<1.0	30.6
10	Olympia Elementary School	1.5	5.4
11	Kitty Hawk Middle School	<1.0	1.9
12	Laura Ingalls Wilder Intermediate School	<1.0	3.0
13	Copperfield Elementary School	4.6	28.4
14	Ray D Corbett Junior High School	4.7	43.5
Seguin AAF			
5	Southwest Preparatory School	1.8	7.0
6	Seguin Christian Academy	<1.0	3.2
7	Seguin High School	<1.0	1.6
8	Jim Barnes Middle School	<1.0	2.4

Sources: DAF 2020b, ANSI 2008, and DNWG 2009a
Note: Schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Sleep Interference. Sleep interference is another source of annoyance associated with louder low-altitude aircraft overflights. This is especially true due to the intermittent nature of aircraft noise, which can be more disturbing than continuous noises. Sleep disturbance is not just a factor of how loud, but also the duration of each noise event; therefore, sleep disturbance is best reflected with the SEL metric, which captures the total energy (i.e., level and duration) of each noise event. ANSI and the Acoustical Society of America have jointly approved a standard, ANSI/the Acoustical Society of America S12.9-2008/Part 6, to predict awakenings associated with outdoor noise events heard in the home. The standard suggests methods for calculating the probability of awakening at least once to the sound from distributions of single noise events. **Table 3-29** outlines the number of events above 90 dB SEL with the probability of a person awakening.

Table 3-29. Probability of Awakening at Least Once from Multiple Events at SEL 90 dB

	Probability of Awakening at Least Once (%)	
Number of Events Above 90 dBA SEL	**Windows Closed[a]**	**Windows Open[b]**
1	1%	2%
3	4%	6%
5	7%	10%
9	12%	18%
18	22%	33%
27	32%	45%

Sources: DNWG 2009a and ANSI 2008
Notes: a = Windows closed assumes a 25 dB noise level reduction between the outdoors and indoors (e.g., 90 SEL outdoors is 65 SEL indoors.)
b = Windows open assumes that there is a 15 dB noise level reduction between the outdoors and indoors (e.g., 90 SEL outdoors is 75 SEL indoors).

With full implementation of the Proposed Action, there would be an average of 16 aircraft operations at JBSA-Randolph each night (10 p.m. to 7 a.m.), all of which would operate for some amount of time below altitudes that could interfere with sleep inside buildings. Sound from individual T-7A overflights at an altitude of 2,500 feet AGL during approach or 12,500 feet AGL during takeoff would generate events louder than 90 dBA SEL, whereas individual T-38 overflights at an altitude of 1,250 feet AGL during approach or 4,000 feet AGL during takeoff would. The specified average number of operations noted would not likely occur in evenly spaced increments throughout the night, nor would they likely occur every night. Nighttime flights would occur as the training syllabus directs and would likely occur in "grouped" sessions meaning that several overflights may occur during a short period of time on one particular night, and there may be nights where no nighttime flying occurs. Due to scheduling changes, aircraft maintenance, weather, and other unpredictable events, it is not possible to forecast when nighttime events would occur; therefore, this analysis portrays the impact with operations averaged throughout the night, for each night. JBSA-Randolph would operate night flights in a manner to minimize nighttime aircraft noise to the community to the maximum extent practicable.

Sound levels for T-38C and T-7A operating near JBSA-Randolph would be higher than 90 dBA SEL, and a percentage of individuals directly under the flight paths of individual overflights would likely experience some amount of sleep interference. **Table 3-30** outlines the probability of individuals in nearby representative residential areas awakening at least once, both with their windows closed and their windows open. Depending on individual flight patterns and power settings, aircraft overflights would awaken between approximately 1 and 5 percent of individuals residing near the end of the runways and under closed patterns to the east of JBSA-Randolph on any given night. There are currently no nighttime T-38C air operations at JBSA-Randolph, and there would be no nighttime air operations of T-38C or T-7A aircraft at Seguin AAF with implementation of the Proposed Action. Nighttime aircraft operations currently occur at JBSA-Lackland for C-5 and F-16 aircraft. The additional proposed nighttime T-7A aircraft operations at JBSA-Lackland would be minor to the existing number of operations and would not

significantly affect current sleep interference impacts. Figures depicting the probability for sleep awakening for areas around the installations are in **Appendix C**.

Table 3-30. Probability of Awakening at Least Once – Proposed Action

ID	Representative Location	Type	Probability of Awakening at Least Once % Windows Closed (% Windows Open)
1	Boeing Drive and Graytown Road	Residential	1.2% (1.8%)
2	FM1518 and Abbott Road	Residential	3.0% (4.7%)
3	Kitty Hawk Road and Toepperwein Road	Residential	0.0% (0.0%)
4	Seguin Road and Crestway Drive	Residential	0.0% (0.0%)
5	Kitty Hawk Road and Pat Booker Road	Residential	2.0% (3.1%)
6	Roy Richard Drive and Green Valley Road	Residential	1.7% (2.7%)
7	FM78 and FM1103	Residential	3.0% (4.6%)

Sources: DAF 2020b, DNWG 2009a, DNWG 2009b, and ANSI 2008.
Note: Representative locations 1 through 7 are centralized intersections in residential areas and have been assessed for a 9-hour night (10 p.m. to 7 a.m.)

Potential for Hearing Loss. **Table 3-31** outlines the estimated number of residents with the potential for hearing loss with the implementation of the Proposed Action. Based on aerial counts, there would be an estimated 584 houses near JBSA-Randolph exposed to Leq(24) greater than 80 dBA, and 1,729 residents with the potential for long-term (40 years) hearing loss. These residents live primarily on-installation or near the northern installation boundary and would have a potential for noise-induced hearing loss that ranged from 3 to 15 dBA. There would be an estimated 19 houses near Seguin AAF exposed to Leq(24) greater than 80 dBA, and 51 residents with the potential for long-term hearing loss. These residents live primarily north of the airfield and would have a potential for noise induced hearing loss that ranged from 3 to 10 dBA. This identified "potential" for hearing loss is strictly based upon the location of residences in relation to the predicted 80 dBA aircraft noise contour and does not represent a determination that all or any individuals will experience hearing loss. Residents would not likely be exposed to this level of noise for periods long enough to cause hearing loss as individuals leave the property for extensive periods to attend work, school, or other off-property activities. When at home and within the residence, the structure would normally provide sufficient noise suppression to lower aircraft noise levels far below the level that would lead to hearing loss. Individual aircraft overflights at JBSA-Randolph and Seguin AAF would continue to not be supersonic and not generate sonic booms above 140 dB; therefore, no individuals would be exposed to instantaneous sound levels loud enough to damage hearing.

Table 3-31. Number of Residents with the Potential for Hearing Loss – Proposed Action

Average Sound Level (dBA Leq(24)	Noise Induced Hearing Loss (dB)		Estimated Number of Residents with the Potential for Hearing Loss			
			JBSA-Randolph			Seguin AAF
Contour	Average	10th Percentile	On-Base	Off-Base	Total	Total[a]
80-81	3.0	7.0	68	592	660	8
81-82	3.5	8.0	62	246	308	11
82-83	4.0	9.0	44	246	290	22
83-84	4.5	10.0	53	258	311	11
84-85	5.5	11.0	47	59	107	0
85-86	6.0	12.0	0	24	24	0
86-87	7.0	13.5	6	9	15	0
87-88	7.5	15.0	12	3	15	0
		Total	293	1,436	1,729	51

Sources: DAF 2020b and DNWG 2013.
[a] There are no on-installation residents at Seguin AAF.

3.2.3.1.2 Airspace

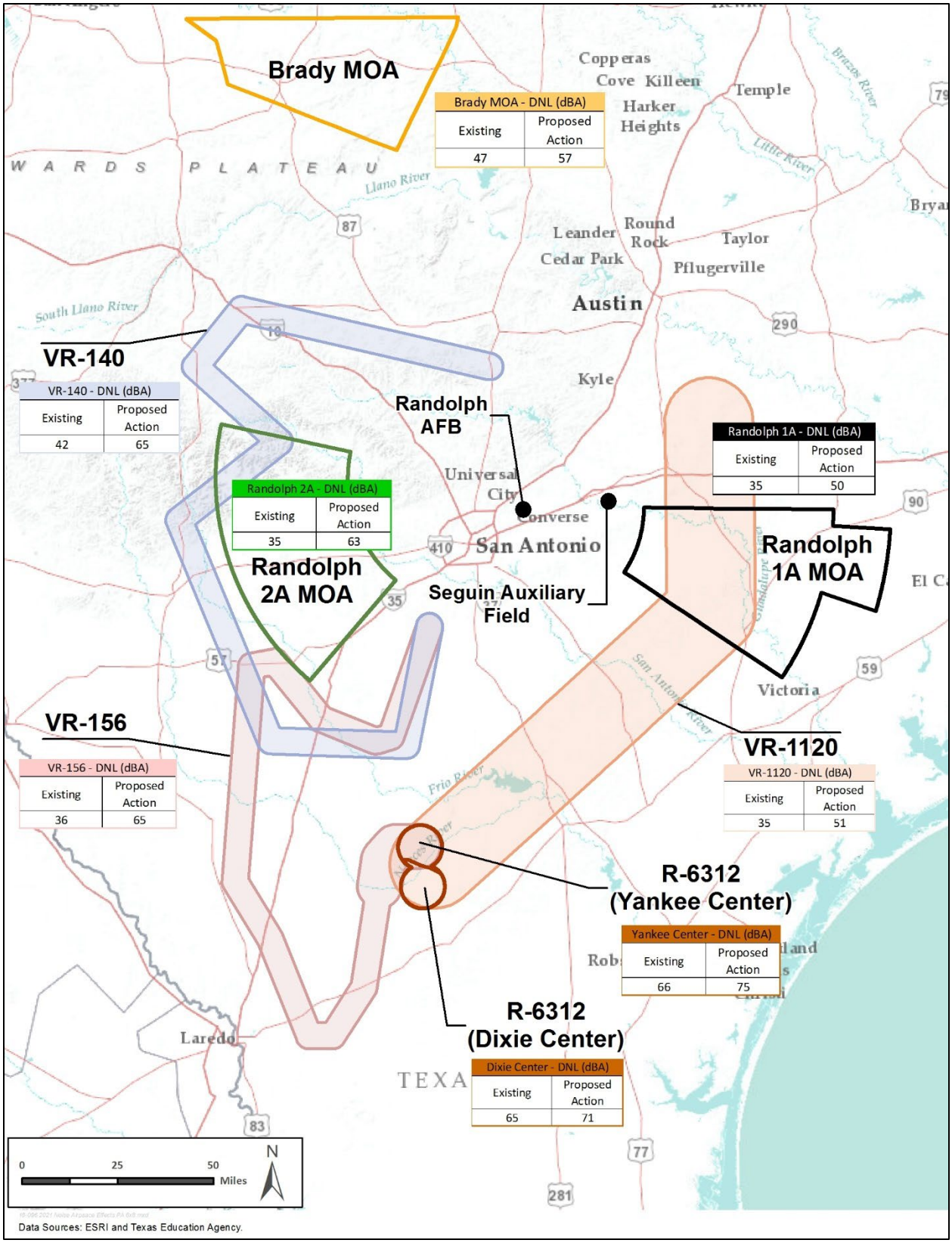
3.2.3.1.2.1 Overall Aircraft Noise

Table 3-32 and **Figure 3-10** show the overall sound levels (i.e., DNL) for areas beneath the MOAs, MTRs, and R-6312 both with and without the Proposed Action. The overall noise under the airspace would increase 6 to 29 dBA DNL depending on the airspace component, which is an appreciable change in the overall noise environment. The overall sound levels for all areas, other than R-6312, VR-140, and VR-156, would be less than 65 dBA DNL, and would remain compatible with all land uses. The overall sound levels at the ranges within R-6312, and under VR-140 and VR-156 would be greater than 65 dBA DNL, and normally incompatible with sensitive land uses. There are a limited number of residences within R-6312 near the ranges which are considered existing incompatible land uses (DAF 2017a). There are numerous residences below both VR-140 and VR-156 that would become incompatible with the overall noise with the implementation of the Proposed Action.

Table 3-32. Overall Sound Levels Beneath the Airspace – Proposed Action

Special Use Airspace	Altitudes	Overall Sound Level (dBA DNL)	
		Existing Conditions	Proposed Action
Randolph 1A MOA	8,000'–17,999' MSL	35	50
Randolph 2A MOA	9,000'–17,999' MSL	35	63
Brady MOA	500' AGL–17,999' MSL	47	57
R-6312 (Dixie Center)	Surface–23,000' MSL	65	71
R-6312 (Yankee Center)	Surface–23,000' MSL	66	75
VR-1120	100'–1,500' AGL	35	51
VR-140	500'–4,500' AGL	42	65
VR-156	Surface–3,000' AGL	36	65

Sources: DAF 2017a, DAF 2020b



Source: DAF 2020b

Figure 3-10. Overall Aircraft Noise in Special Use Airspace – Proposed Action

3.2.3.1.2.2 Individual Aircraft Overflights

Table 3-26 and **Figure 3-8** and **Figure 3-9** outline the L_{max} and SEL for individual overflights of the T-38C and the T-7A in their primary operating modes. Individual overflights conducted within the MOAs, MTRs, and R-6312 would increase in both frequency and level when compared to existing conditions. T-7A overflights, similar to the T-38C overflights, would remain clearly audible, sometimes loud, to individuals who are outdoors, and clearly perceptible inside buildings below their flight path. An assessment of speech interference, potential for hearing loss, and damage to hearing is provided as follows.

Speech Interference. A T-7A would be loud enough to have the potential to interfere with speech on the ground when operating below 5,000 feet AGL in approach or cruise modes or below 13,000 feet AGL in takeoff and afterburner modes (**Figure 3-8**). Unlike the T-38C, T-7A operations within Randolph 1A and 2A MOAs would normally be loud enough to interfere with speech on the ground. Similar to the T-38C, T-7A operations in the Brady Low MOA, R-6312, and the MTRs would be loud enough to interfere with speech on the ground; however, individual T-7A overflights that meet these criteria would be louder, longer in duration, and more frequent when compared to existing conditions.

The majority of the 5,903 sortie operations per year (16 per day) throughout the airspace would have flight components that would operate within all the MOAs, MTRs, the range, and would have some amount of speech interference for individuals below. These effects would continue to be distributed throughout areas beneath the airspace, and some locations would experience these events more often than others. As outlined above, these events would be loud enough or frequent enough to create areas of incompatible land use under R-6312, and some segments of VR-140 and VR-156.

Potential for Hearing Loss. As with the T-38C, and for similar reasons, T-7A activity in the MOAs, MTRs, and R-6312 would not be sufficient to generate Leq(24) greater that 80 dBA, or an instantaneous noise greater than 140 dB (i.e., sonic boom). Therefore, there would be no PHL for individuals beneath these airspaces (DNWG 2013).

Damage to Structures. As with the T-38C, T-7A operations in the MOAs, MTRs, and R-6312 would not be supersonic and would not generate sonic booms above 140 dB; therefore, there would be no potential for damaging structures in areas beneath these airspaces.

3.2.3.2 Alternative 1

Alternative 1 would have short-term, minor and long-term, significant, adverse effects on the noise environment. Short-term effects would be due to noise generated by heavy equipment during construction and demolition, and the nature and overall level of these effects would be identical to those outlined under the Proposed Action. As with the Proposed Action, long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training operations, and the introduction of operations between 10 p.m. and 7 a.m. Long-term changes in operational noise would substantially increase areas of incompatible land use on and adjacent to JBSA-Randolph and Seguin AAF. Similar to the Proposed Action, the introduction of T-7A aircraft would be incremental, beginning in 2023 and reaching full implementation in 2028. Due to the limited number of operations, changes in noise at JBSA-Lackland would be negligible.

3.2.3.2.1 JBSA-Randolph, Seguin AAF, and JBSA-Lackland

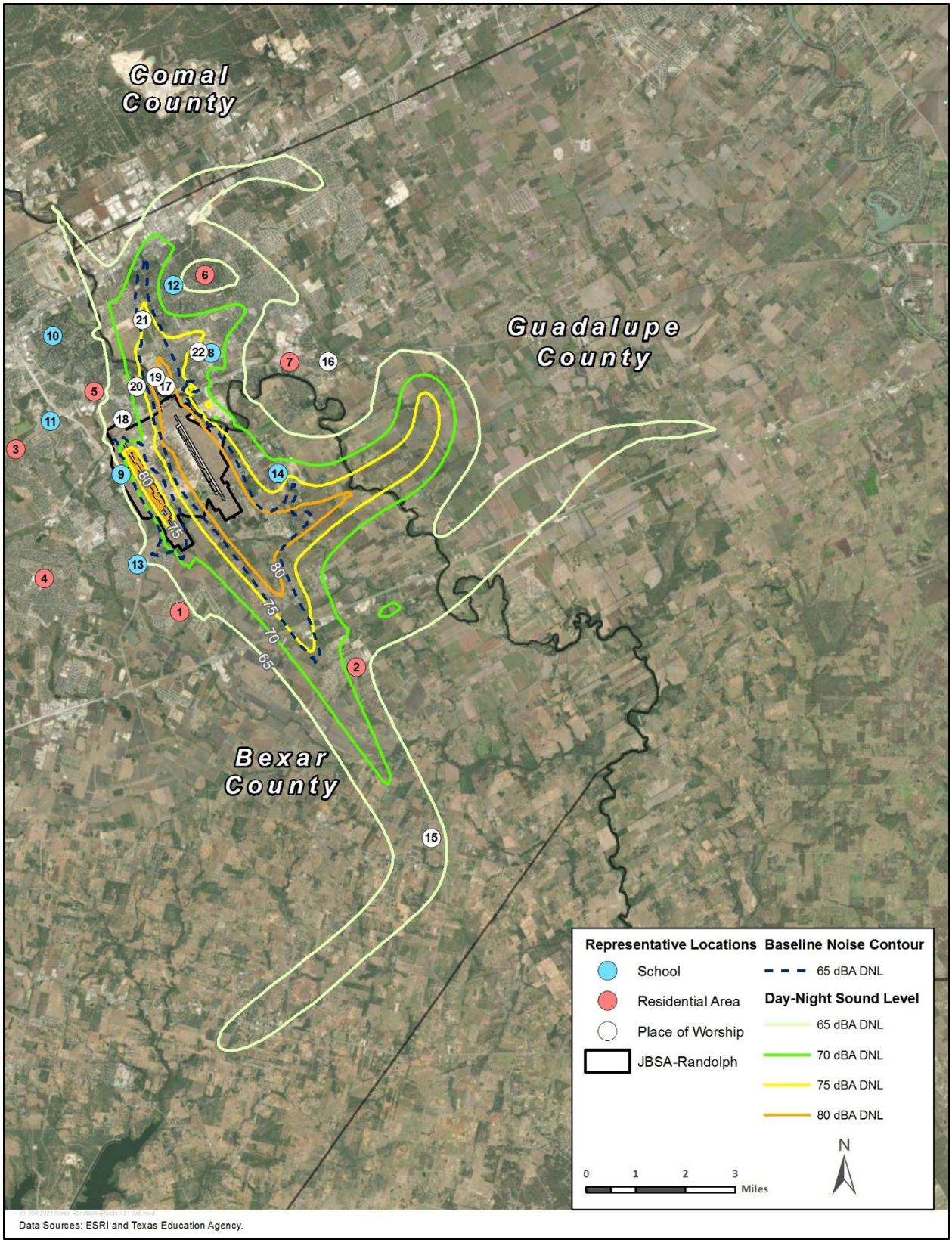
3.2.3.2.1.1 Overall Aircraft Noise

Noise levels on and adjacent to JBSA-Randolph and Seguin AAF with the proposed T-7A aircraft were calculated with full implementation of Alternative 1. **Figure 3-11** and **Figure 3-12** show the installation-wide DNL noise contours with and without the T-7A conversion. **Table 3-33** presents the land acreage and estimated population exposed to noise levels 65-dBA DNL or greater at JBSA-Randolph and Seguin AAF at full implementation of Alternative 1.

With the implementation of Alternative 1, similar to the Proposed Action, the 65, 70, 75, and 80 dBA DNL noise contours at JBSA-Randolph would expand appreciably in all directions when compared to the existing conditions. The off-installation areas surrounding JBSA-Randolph exposed to 65 dBA DNL or greater would increase from 3,036 acres to 35,133 acres and extend as far north as Northcliffe and as far south as Saint Hedwig. The estimated number of residents within the 65 dBA DNL contour would increase from 5,083 to 48,568.

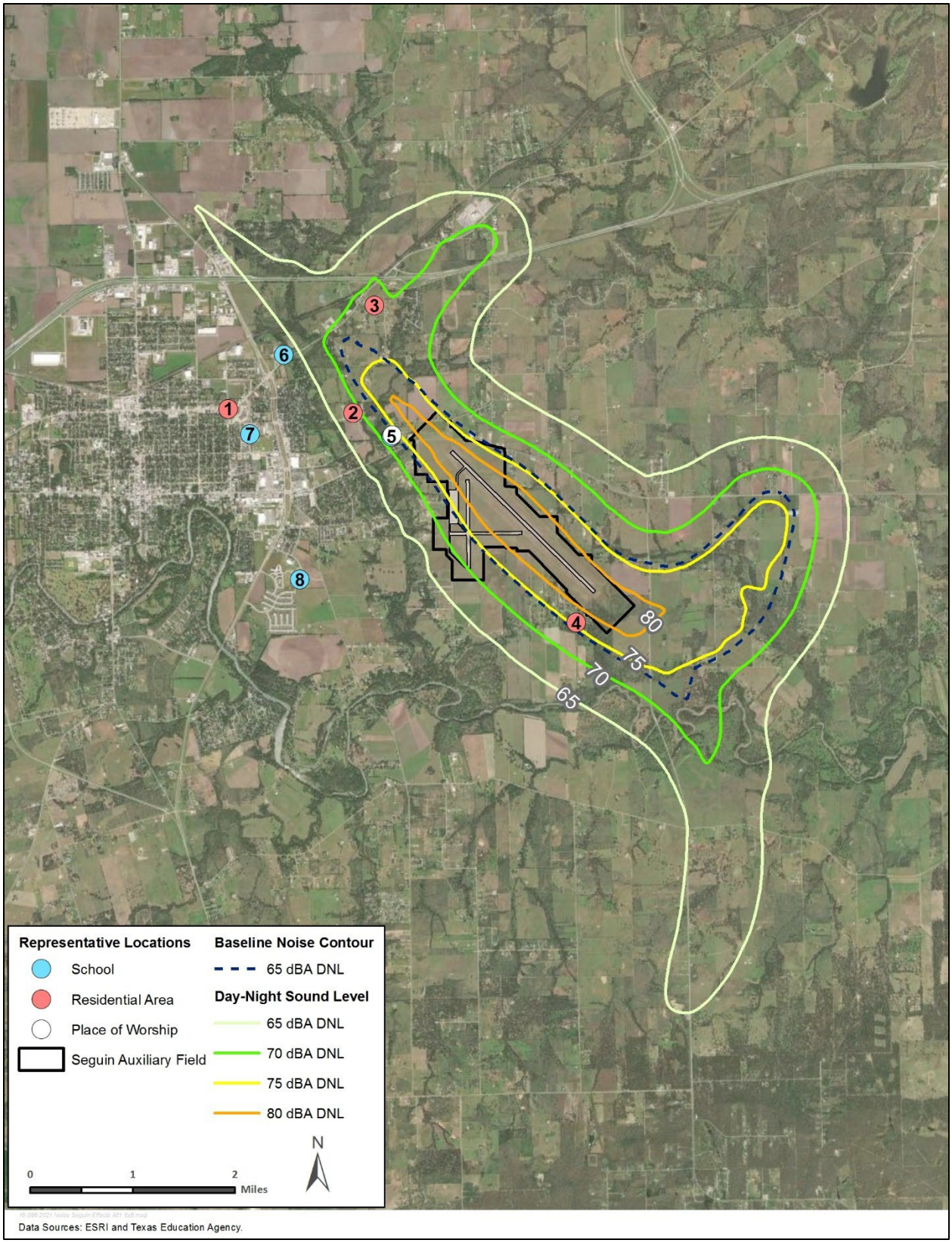
With implementation of Alternative 1, similar to the Proposed Action, the 65, 70, 75, and 80 dBA DNL noise contours at Seguin AAF would expand appreciably in all directions when compared to the existing conditions. The off-installation areas surrounding Seguin AAF exposed to 65 dBA DNL or greater would increase from 2,002 acres to 9,660 acres. The estimated number of residents within the 65 dBA DNL contour would increase from 417 to 2,029.

With full implementation of Alternative 1, T-7A aircraft from JBSA-Randolph would account for approximately 900 total day and nighttime operations per year or approximately two to three operations per day at JBSA-Lackland (i.e., approximately 1.3 percent of the total operations) (DAF 2019). The nature and overall level of effects from these overflights would be similar to, but slightly less than, those outlined under the Proposed Action. As the T-7A would account for only 1.3 percent of the total operations, they would not contribute appreciably to the overall noise environment surrounding the installation.



Source: DAF 2020b

Figure 3-11. Noise Contours for JBSA-Randolph – Alternative 1



Source: DAF 2020b

Figure 3-12. Noise Contours for Seguin AAF – Alternative 1

Table 3-33. Areas and Estimated Population within Noise Contours – Alternative 1

Noise Contour (dBA DNL)	Area Under Contours (Acres)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	687	2,092	2,778	122	1,451	1,573
70–75	499	731	1,229	180	508	688
75–80	444	192	637	272	43	314
>80	482	22	503	252	0	252
Total	**2,111**	**3,036**	**5,148**	**824**	**2,002**	**2,826**
Alternative 1						
65–70	338	21,851	22,189	44	5,347	5,391
70–75	695	7,273	7,968	126	2,754	2,880
75–80	571	3,845	4,416	190	1,385	1,574
>80	1,287	1,636	2,923	606	174	780
Total	**2,892**	**34,605**	**37,497**	**966**	**9,660**	**10,626**
Change from Existing Conditions						
65–70	-357	20,288	19,932	-78	3,896	3,818
70–75	196	6,557	6,753	-54	2,246	2,192
75–80	156	3,639	3,795	-82	1,342	1,260
>80	784	1,613	2,397	355	174	529
Total	**779**	**32,097**	**32,877**	**142**	**7,658**	**7,800**

Noise Contour (dBA DNL)	Estimated Population (Individuals)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	278	3,359	3,637	25	302	327
70–75	192	1,563	1,755	37	106	143
75–80	187	149	336	56	9	65
>80	196	12	208	52	0	52
Total	**853**	**5,083**	**5,936**	**170**	**417**	**587**
Alternative 1						
65–70	162	30,047	30,209	9	1,139	1,148
70–75	281	11,472	11,753	26	565	591
75–80	230	5,329	5,559	40	288	328
>80	527	1,720	2,247	125	37	162
Total	**1,200**	**48,568**	**49,768**	**200**	**2,029**	**2,229**
Change from Existing Conditions						
65–70	-116	26,688	26,572	-16	837	821
70–75	89	9,909	9,998	-11	459	448
75–80	43	5,180	5,223	-16	279	263
>80	331	1,708	2,039	73	37	110
Total	**347**	**43,485**	**43,832**	**30**	**1,612**	**1,642**

Note: Estimated population based on area within individual census blocks.
Sources: DAF 2020b and U.S. Census Bureau 2018

As with the Proposed Action, the noise contours developed in this EIS are based on the best available information at this time. Once the T-7A aircraft would begin to arrive at JBSA-Randolph, DAF would (1) analyze T-7A flying patterns and operational settings, (2) update the installation's AICUZ plan, and (3) support the community in developing a JLUS for the installation and surrounding community. These actions would allow for more accurately predicting noise surrounding the installations and developing noise-specific mitigation measures.

Table 3-34 lists the overall sound levels (i.e., DNL) for the representative locations around JBSA-Randolph and Seguin AAF with the implementation of Alternative 1. The number of representative locations exposed to overall sound levels greater than 65 dBA DNL near JBSA-Randolph and Seguin AAF would increase from four to eighteen when compared to existing conditions. Thirteen out of the twenty-two representative locations near JBSA-Randolph would be exposed to overall sound levels greater than 65 dBA DNL, including one out of the seven residential areas, four out of the six schools, and seven of the eight places of worship. Five out of the nine representative locations near Seguin AAF would be exposed to overall sound levels greater than 65 dBA DNL, including three of the four residential areas, one out of the four schools, and the place of worship. All other representative residential areas, schools, and places of worship at both installations would be exposed to overall noise levels less than 65 dBA DNL.

3.2.3.2.1.2 Individual Overflight Noise

With the implementation of Alternative 1, the nature and overall levels of noise from individual T-7A overflights would be similar to those outlined under the Proposed Action; however, there would be approximately 33 percent less operations. T-7A overflights would incrementally increase as T-38Cs were phased out, and individual acoustical events would increase in duration, level, and frequency when compared to existing conditions. An assessment of speech interference, sleep interference, and potential for hearing loss are provided as follows. As with Proposed Action, and for similar reasons, there would be no potential for damaging structures in areas surrounding the installation.

Speech Interference. With full implementation of Alternative 1, there would be an average of 208 aircraft operations at JBSA-Randolph and 89 aircraft operations at Seguin AAF each day, all of which would operate for some amount of time below altitudes that could interfere with speech inside buildings. Similar to the Proposed Action, a broader range of areas near the two installations would experience aircraft overflights that would range from loud to very loud, exceeding 75 dBA L_{max} at any given point on the ground and interfere with communication for individuals beneath the aircrafts' flight paths.

Table 3-34. Overall Sound Levels at Representative Locations – Alternative 1

ID	Representative Location	Overall Sound Level (dBA DNL)		
		Type	Existing Conditions	Alternative 1
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	54	62
2	FM1518 and Abbott Road	Residential	55	**67**
3	Kitty Hawk Road and Toepperwein Road	Residential	45	50
4	Seguin Road and Crestway Drive	Residential	45	51
5	Kitty Hawk Road and Pat Booker Road	Residential	57	64
6	Roy Richard Drive and Green Valley Road	Residential	49	63
7	FM78 and FM1103	Residential	46	62
8	Samuel Clemens High School	School	59	**72**
9	Randolph High School	School	59	**66**
10	Olympia Elementary School	School	56	**68**
11	Kitty Hawk Middle School	School	52	58
12	Laura Ingalls Wilder Intermediate School	School	54	**66**
13	Copperfield Elementary School	School	61	64
14	Ray D Corbett Junior High School	School	58	**73**
15	Hebron Church	Worship	56	**68**
16	Saint Paul Church	Worship	47	61
17	Resurrection Baptist Church	Worship	**74**	**83**
18	The Hanmi Presbyterian Church	Worship	57	**67**
19	Greater Randolph Seventh Day Adventist Church	Worship	**73**	**82**
20	Universal City United Methodist Church	Worship	59	**72**
21	Faith Apostolic Church	Worship	**68**	**76**
22	Church of Christ Schertz	Worship	60	**73**
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	41	55
2	Windbrook Subdivision	Residential	58	**70**
3	Sunbelt Road	Residential	62	**72**
4	Aux Airport Road and Oak Hill Drive	Residential	**67**	**77**
5	Southwest Preparatory School	School	63	**73**
6	Seguin Christian Academy	School	52	64
7	Seguin High School	School	43	56
8	Jim Barnes Middle School	School	40	54
9	Grace Family Bible Church	Worship	64	**74**

Source: DAF 2020b.
Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.
Bolded sound levels indicate incompatible land uses.

Table 3-35 outlines the number of individual aircraft overflights above 50 dBA which are loud enough to interrupt communication within the representative residential areas and schools with the implementation of Alternative 1. The number of events loud enough to interfere with communication would increase in range to less than one to eleven events per hour for representative locations around JBSA-Randolph, and from one to four events per hour for representative locations around Seguin AAF. Other residential areas and schools in the immediate area of the installations would likely fall within this range. Figures depicting areas around the installations that would experience some amount of speech interference are in **Appendix C**.

Table 3-35. Number of Events Loud Enough to Interfere with Speech – Alternative 1

ID	Representative Location	Type	Number of Events Loud Enough to Interfere with Speech (events/hour)	
			Existing Conditions	Alternative 1
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	<1	4
2	FM1518 and Abbott Road	Residential	2	3
3	Kitty Hawk Road and Toepperwein Road	Residential	<1	<1
4	Seguin Road and Crestway Drive	Residential	<1	<1
5	Kitty Hawk Road and Pat Booker Road	Residential	5	7
6	Roy Richard Drive and Green Valley Road	Residential	<1	1
7	FM78 and FM1103	Residential	<1	2
8	Samuel Clemens High School	School	3	8
9	Randolph High School	School	<1	7
10	Olympia Elementary School	School	1	1
11	Kitty Hawk Middle School	School	<1	1
12	Laura Ingalls Wilder Intermediate School	School	<1	3
13	Copperfield Elementary School	School	5	11
14	Ray D Corbett Junior High School	School	5	7
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	<1	1
2	Windbrook Subdivision	Residential	1	3
3	Sunbelt Road	Residential	1	2
4	Aux Airport Road and Oak Hill Drive	Residential	3	3
5	Southwest Preparatory School	School	1	3
6	Seguin Christian Academy	School	<1	2
7	Seguin High School	School	<1	1
8	Jim Barnes Middle School	School	<1	3

Sources: DAF 2020b and DNWG 2009a.
Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.
Residential areas assessed for a 15-hour day (7 a.m. to 10 p.m.) and schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Table 3-36 outlines the number of minutes on average that class time would be above 50 dBA and interrupted by aircraft intrusions at the representative schools with the implementation of Alternative 1. The amount of time when aircraft would be loud enough to interfere with classroom communication would increase in range to between 2 and 30 minutes for representative schools around JBSA-Randolph, and between 2 and 6 minutes for representative schools around Seguin AAF. Other schools in the immediate area of the installations would likely fall within this range. Figures depicting the amount of class time loud enough to interfere with speech for areas around the installations are in **Appendix C**.

Table 3-36. Class Time Loud Enough to Interfere with Speech – Alternative 1

ID	Representative School	Time Loud Enough to Interfere with Classroom Communication (minutes/school day)	
		Existing Conditions	Alternative 1
JBSA-Randolph			
8	Samuel Clemens High School	2.8	8.4
9	Randolph High School	<1.0	20.5
10	Olympia Elementary School	1.5	3.6
11	Kitty Hawk Middle School	<1.0	1.4
12	Laura Ingalls Wilder Intermediate School	<1.0	2.0
13	Copperfield Elementary School	4.6	20.5
14	Ray D Corbett Junior High School	4.7	29.1
Seguin AAF			
5	Southwest Preparatory School	1.8	5.5
6	Seguin Christian Academy	<1.0	2.5
7	Seguin High School	<1.0	1.3
8	Jim Barnes Middle School	<1.0	1.9

Sources: DAF 2020b and DNWG 2009a
Note: Schools assessed for an 8-hour day (8:00 a.m. to 4:00 p.m.)

Sleep Interference. With full implementation of Alternative 1, there would be an average of 11 aircraft operations at JBSA-Randolph each night (10 p.m. to 7 a.m.), all of which would operate for some amount of time below altitudes that could interfere with sleep inside buildings. Sound levels for T-38C and T-7A operating near JBSA-Randolph would be higher than 90 dBA SEL, and some individuals would likely experience some amount of sleep interference. **Table 3-37** outlines the probability of individuals in nearby representative residential areas awakening at least once, both with their windows closed and their windows open. Depending on individual flight patterns and power settings, aircraft overflights would awaken approximately 1 to 2 percent of individuals residing near the end of the runways and under closed patterns to the east of JBSA-Randolph on any given night. There are currently no nighttime T-38C air operations at JBSA-Randolph, and there would be no nighttime air operations of T-38C or T-7A aircraft at Seguin AAF with implementation of Alternative 1. Nighttime aircraft operations currently occur at JBSA-Lackland for C-5 and F-16 aircraft. The additional proposed nighttime T-7A aircraft operations at JBSA-Lackland would be minor to the existing number of operations

and would not significantly affect current sleep interference impacts. Figures depicting the probability for sleep awakening for areas around the installations are in **Appendix C**.

The specified average number of operations noted would not likely occur in evenly spaced increments throughout the night, nor would they likely occur every night. Nighttime flights would occur as the training syllabus directs and would likely occur in "grouped" sessions meaning that several overflights may occur during a short period of time on one particular night, and there may be nights where no nighttime flying occurs. Due to scheduling changes, aircraft maintenance, weather, and other unpredictable events, it is not possible to forecast when nighttime events would occur; therefore, this analysis portrays the impact with operations averaged throughout the night, for each night. JBSA-Randolph would operate night flights in a manner to minimize nighttime aircraft noise to the community to the maximum extent practicable.

Table 3-37. Probability of Awakening at Least Once – Alternative 1

ID	Representative Location	Type	Probability of Awakening at Least Once % Windows Closed (% Windows Open)
1	Boeing Drive and Graytown Road	Residential	0.8% (1.3%)
2	FM1518 and Abbott Road	Residential	2.2% (3.4%)
3	Kitty Hawk Road and Toepperwein Road	Residential	<0.1% (<0.1%)
4	Seguin Road and Crestway Drive	Residential	<0.1% (<0.1%)
5	Kitty Hawk Road and Pat Booker Road	Residential	1.4% (2.3%)
6	Roy Richard Drive and Green Valley Road	Residential	1.3% (2.0%)
7	FM78 and FM1103	Residential	2.1% (3.3%)

Sources: DAF 2020b, DNWG 2009a, DNWG 2009b, and ANSI 2008
Note: Representative locations 1 through 7 are centralized intersections in residential areas and have been assessed for a 9-hour night (10 p.m. to 7 a.m.)

Potential for Hearing Loss. **Table 3-38** outlines the estimated number of residents with the potential for hearing loss with the implementation of Alternative 1. Based on aerial counts, there would be an estimated 289 houses near JBSA-Randolph exposed to Leq(24) greater than 80 dBA, and 855 residents with the potential for long-term (40 years) hearing loss. These residents live primarily on-installation or near the northern installation boundary and would have a potential for noise induced hearing loss that ranged from 3 to 12 dBA. There would be an estimated 16 houses near Seguin AAF exposed to Leq(24) greater than 80 dBA, and 43 residents with the potential for long-term hearing loss. These residents live primarily north of the airfield and would have a potential for noise-induced hearing loss that ranged from 3 to 9 dBA. This identified "potential" for hearing loss is strictly based upon the location of residences in relation to the predicted 80 dBA aircraft noise contour and does not represent a determination that all or any individuals will experience hearing loss. Residents would not likely be exposed to this level of noise for periods long enough to cause hearing loss as individuals leave the property for extensive periods to attend work, school, or other off-property activities. When at home and within the residence, the structure would normally provide sufficient noise suppression to lower aircraft noise levels far below the level that would lead to hearing loss.

Individual aircraft overflights at JBSA-Randolph and Seguin AAF would continue to not be supersonic and not generate sonic booms above 140 dB; therefore, no individuals would be exposed to instantaneous sound levels loud enough to damage hearing.

Table 3-38. Number of Residents with the Potential for Hearing Loss – Alternative 1

Average Sound Level (dBA Leq(24)	Noise Induced Hearing Loss (dB)		Estimated Number of Residents with the Potential for Hearing Loss			
			JBSA-Randolph			Seguin AAF
Contour	Average	10th Percentile	On-Base	Off-Base	Total	Total[a]
80-81	3.0	7.0	47	240	287	16
81-82	3.5	8.0	62	266	329	16
82-83	4.0	9.0	47	115	163	11
83-84	4.5	10.0	15	30	44	0
84-85	5.5	11.0	0	12	12	0
85-86	6.0	12.0	18	3	21	0
		Total	189	666	855	43

Sources: DAF 2020b and DNWG 2013
[a] There are no on-base residents at Seguin AAF.

3.2.3.2.2 Airspace

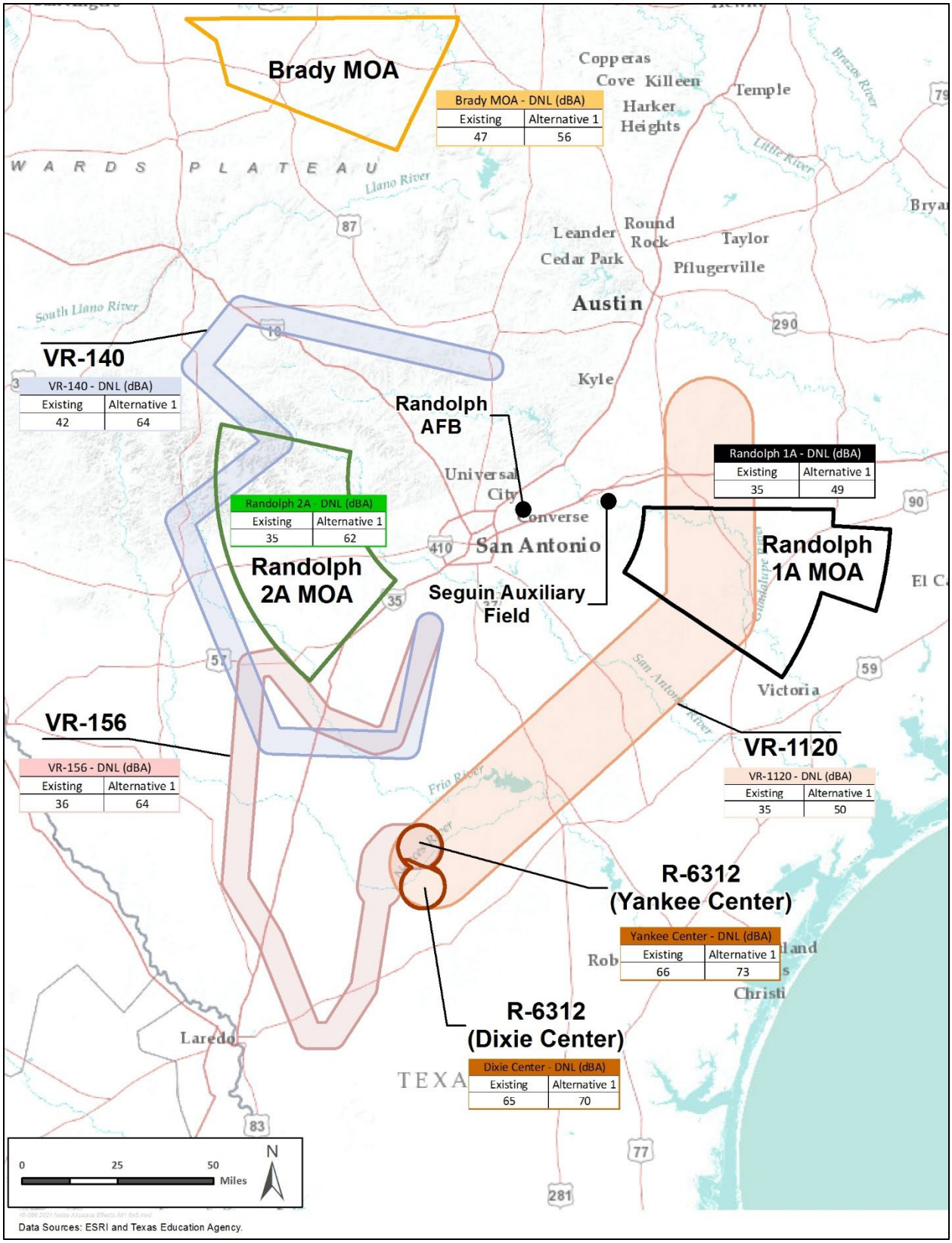
3.2.3.2.2.1 Overall Aircraft Noise

Table 3-39 and **Figure 3-13** show the overall sound levels (i.e., DNL) for areas beneath the MOAs, MTRs, and R-6312 both with and without Alternative 1. The overall noise under the airspace would increase 5 to 28 dBA DNL depending on the airspace component, which is an appreciable change in the overall noise environment. The overall sound levels for all areas, other than R-6312, would remain less than 65 dBA DNL, and compatible with all land uses. The overall sound levels at the ranges within R-6312 would continue to be greater than 65 dBA DNL, and normally incompatible with sensitive land uses. There are a limited number of residences within R-6312 near the ranges which are considered existing incompatible land uses (DAF 2017a). There would be no new areas of incompatible land use with the implementation of Alternative 1.

Table 3-39. Overall Sound Levels Beneath the Airspace – Alternative 1

Special Use Airspace	Altitudes	Overall Sound Level (dBA DNL)	
		Existing Conditions	Alternative 1
Randolph 1A MOA	8,000'–17,999' MSL	35	49
Randolph 2A MOA	9,000'–17,999' MSL	35	62
Brady MOA	500' AGL–17,999' MSL	47	56
R-6312 (Dixie Center)	Surface–23,000' MSL	65	70
R-6312 (Yankee Center)	Surface–23,000' MSL	66	73
VR-1120	100'–1,500' AGL	35	50
VR-140	500'–4,500' AGL	42	64
VR-156	Surface–3,000' AGL	36	64

Sources: DAF 2017a, DAF 2020b



Source: DAF 2020b

Figure 3-13. Overall Aircraft Noise in Special Use Airspace – Alternative 1

3.2.3.2.2.2 Individual Aircraft Overflights

Effects from individual overflights within the MOAs, MTRs, and R-6312 would be identical to those outlined under the Proposed Action, except there would be only 4,555 annual operations (12 per day) within the airspace. The majority of the operations would have flight components that would have some amount of speech interference for individuals below. These effects would continue to be distributed throughout areas beneath the airspace and would neither be loud enough nor frequent enough to create new areas of incompatible land use. As with the Proposed Action, and for similar reasons, there would be no potential for hearing loss for individuals or for damaging structures beneath these airspaces.

3.2.3.3 Alternative 2

Alternative 2 would have short-term, minor and long-term, significant, adverse effects on the noise environment. Short-term effects would be due to noise generated by heavy equipment during construction and demolition, and the nature and overall level of these effects would be identical to those outlined under the Proposed Action. As with the Proposed Action, long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training operations, and the introduction of operations between 10 p.m. and 7 a.m. Long-term changes in operational noise would substantially increase areas of incompatible land use on and in the vicinity to JBSA-Randolph and Seguin AAF. Due to the limited number of operations, changes in noise at JBSA-Lackland would be negligible.

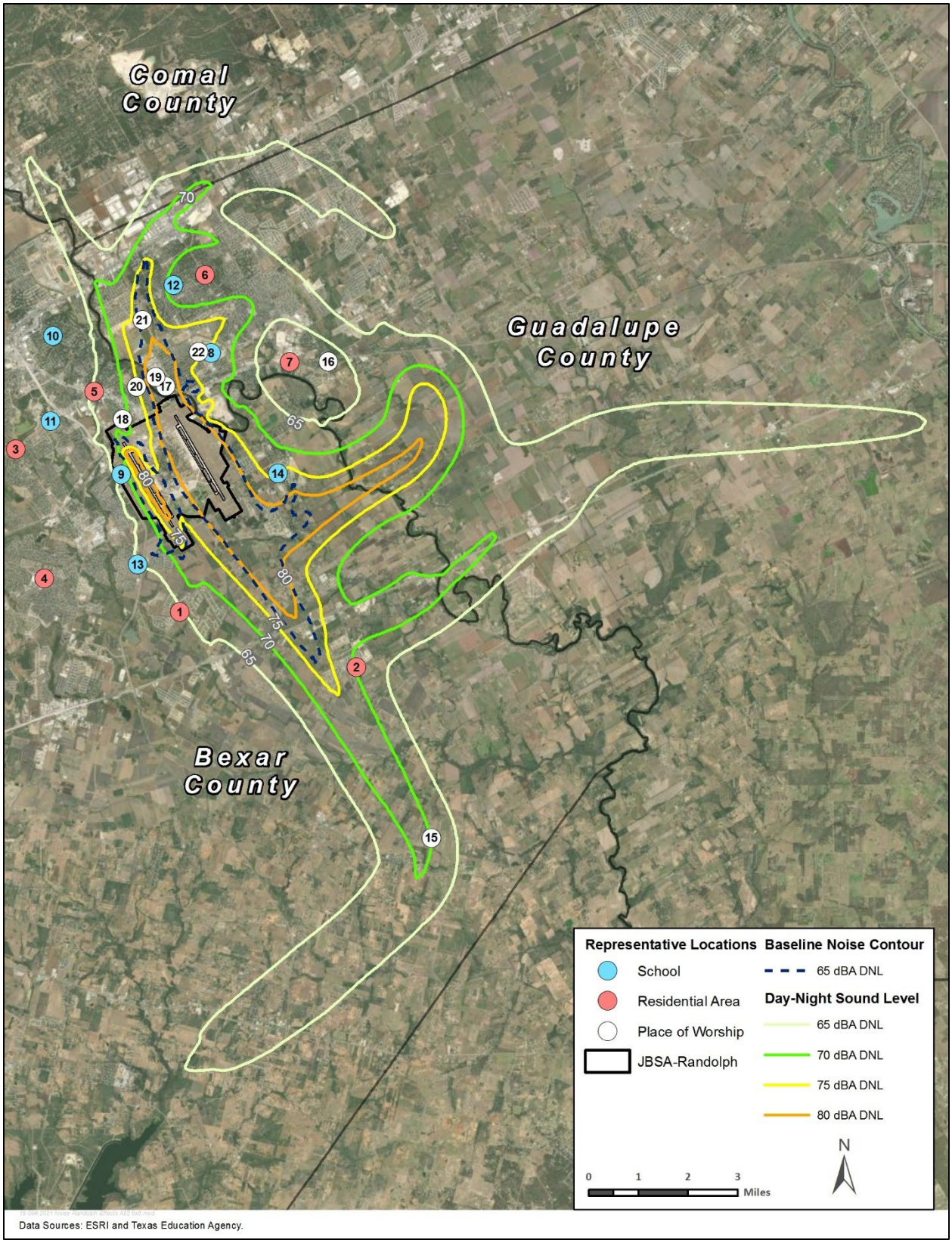
3.2.3.3.1 JBSA-Randolph, Seguin AAF, and JBSA-Lackland

3.2.3.3.1.1 Overall Aircraft Noise

Noise levels on and adjacent to JBSA-Randolph and Seguin AAF with the proposed T-7A aircraft were calculated with full implementation of Alternative 2. **Figure 3-14** and **Figure 3-15** show the installation-wide DNL noise contours with and without the T-7A conversion. **Table 3-40** presents the land acreage and estimated population exposed to noise levels 65 dBA DNL or greater at JBSA-Randolph and Seguin AAF with the full implementation of Alternative 2.

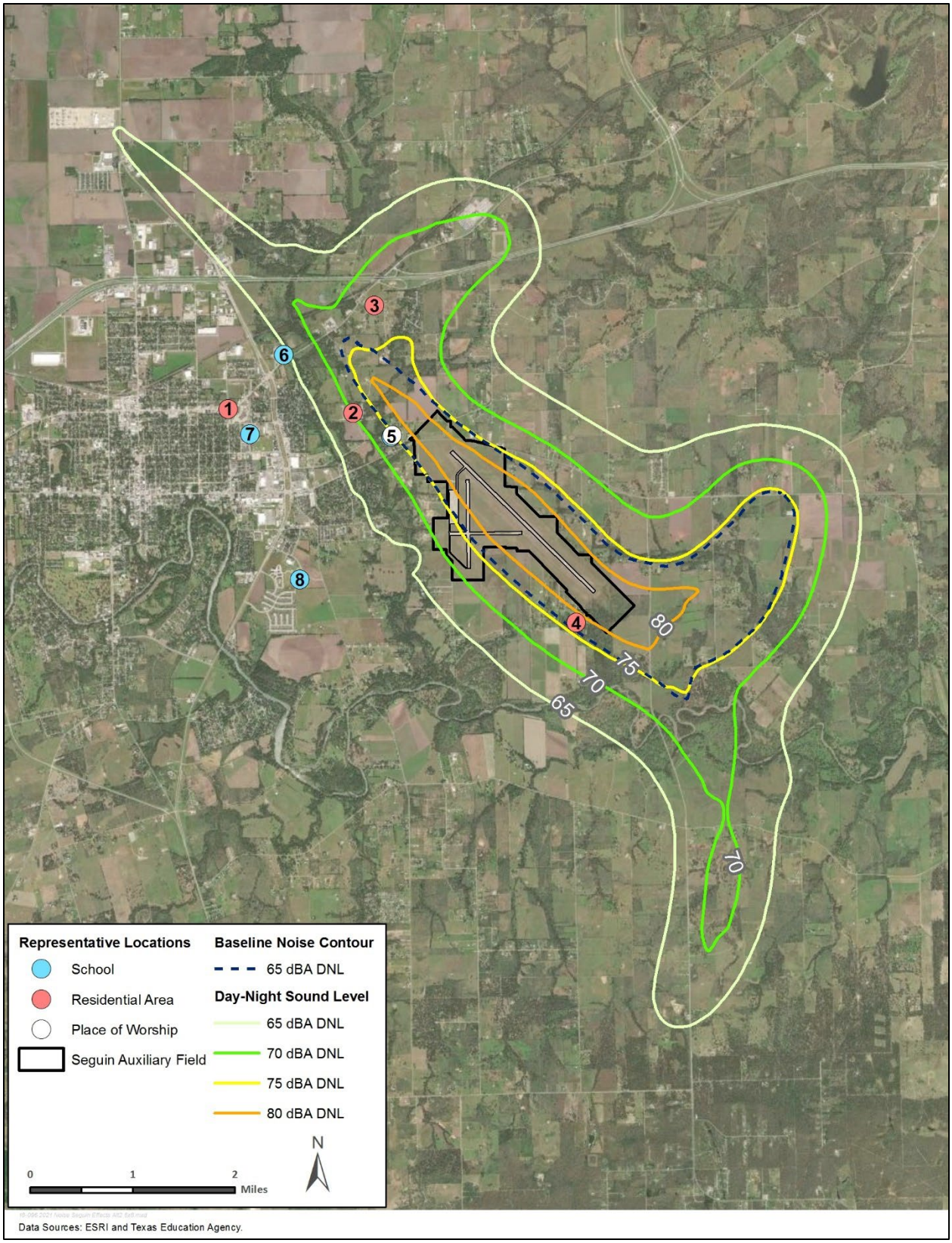
The 65, 70, 75, and 80 dBA DNL noise contours at JBSA-Randolph and Seguin AAF would expand appreciably in all directions when compared to the existing conditions. The off-installation areas surrounding JBSA-Randolph exposed to 65 dBA DNL or greater would increase from 3,065 acres to 48,860 acres and extend as far north as Northcliffe and as far south as Saint Hedwig. The estimated number of residents within the 65-dBA DNL contour would increase from 5,083 to 63,574. The off-installation areas surrounding Seguin AAF exposed to 65 dBA DNL or greater would increase from 2,002 acres to 11,972 acres. The estimated number of residents within the 65 dBA DNL contour would increase from 417 to 3,060.

The noise contours developed in this EIS are based on the best available information at this time. Once the T-7A aircraft would begin to arrive at JBSA-Randolph, DAF would (1) analyze T-7A flying patterns and operational settings, (2) update the installation's AICUZ plan, and (3) support the community in developing a Joint Land Use Study for the installation and surrounding community. These would allow for more accurately predicting noise surrounding the installations and develop noise-specific mitigation measures.



Source: DAF 2020b

Figure 3-14. Noise Contours for JBSA-Randolph – Alternative 2



Source: DAF 2020b

Figure 3-15. Noise Contours for Seguin AAF – Alternative 2

Table 3-40. Areas and Estimated Population within Noise Contours – Alternative 2

Noise Contour (dBA DNL)	Area Under Contours (Acres)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	687	2,092	2,778	122	1,451	1,573
70–75	499	731	1,229	180	508	688
75–80	444	192	637	272	43	314
>80	482	22	503	252	0	252
Total	**2,111**	**3,036**	**5,148**	**824**	**2,002**	**2,826**
Alternative 2						
65–70	230	29,756	29,986	8	6,104	6,113
70–75	472	10,880	11,352	115	3,620	3,734
75–80	732	5,250	5,983	174	1,827	2,000
>80	1,482	2,973	4,454	670	421	1,091
Total	**2,916**	**48,860**	**51,775**	**966**	**11,972**	**12,938**
Change from Existing Conditions						
65–70	-460	31,480	31,020	-113	4,653	4,540
70–75	-45	10,148	10,103	-65	3,112	3,047
75–80	318	5,043	5,361	-98	1,784	1,686
>80	992	2,961	3,953	418	421	840
Total	**806**	**49,632**	**50,437**	**142**	**9,970**	**10,112**

Noise Contour (dBA DNL)	Estimated Population (Individuals)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	278	3,359	3,637	25	302	327
70–75	192	1,563	1,755	37	106	143
75–80	187	149	336	56	9	65
>80	196	12	208	52	0	52
Total	**853**	**5,083**	**5,936**	**170**	**417**	**587**
Alternative 2						
65–70	123	37,126	37,249	2	1,908	1,910
70–75	190	14,978	15,168	24	684	708
75–80	295	8,115	8,410	37	380	417
>80	606	3,355	3,961	138	88	226
Total	**1,214**	**63,574**	**64,788**	**201**	**3,060**	**3,261**
Change from Existing Conditions						
65–70	-155	33,767	33,612	-23	1,606	1,583
70–75	-2	13,415	13,413	-13	578	565
75–80	108	7,966	8,074	-19	371	352
>80	410	3,343	3,753	86	88	174
Total	**361**	**58,491**	**58,852**	**31**	**2,643**	**2,674**

Note: Estimated population based on area within individual census blocks.
Sources: DAF 2020b and U.S. Census Bureau 2018

T-7A aircraft from JBSA-Randolph would account for approximately 1,398 operations per year or approximately operations per day at JBSA-Lackland (i.e., approximately 2.0 percent of the total operations) (DAF 2019). The nature and overall level of effects from these overflights would be similar to, but slightly more than those outlined under the Proposed Action. As the T-7A would account for only 2.0 percent of the total operations, they would not contribute appreciably to the overall noise environment surrounding the installation.

Representative Locations. **Table 3-41** lists the overall sound levels (i.e., DNL) for the representative locations around JBSA-Randolph and Seguin AAF with the implementation of Alternative 2. The number of representative locations exposed to overall sound levels greater than 65 dBA DNL near JBSA-Randolph and Seguin AAF would increase from four to twenty when compared to existing conditions. Fifteen out of the twenty-two representative locations near JBSA-Randolph would be exposed to overall sound levels greater than 65 dBA DNL, including three out of the seven residential areas, five out of the six schools, and seven of the eight places of worship. Five out of the nine representative locations near Seguin AAF would be exposed to overall sound levels greater than 65 dBA DNL, including three of the four residential areas, one out of the four schools, and the place of worship. All other representative residential areas, schools, and places of worship at both installations would be exposed to overall noise levels less than 65 dBA DNL.

3.2.3.3.1.2 Individual Overflight Noise

With the implementation of Alternative 2, the nature and overall levels of noise from individual T-7A overflights would be similar to those outlined under the Proposed Action; however, there would be approximately 15 percent more operations. An assessment of speech interference, sleep interference, and potential for hearing loss are provided below. As with the Proposed Action and for similar reasons, there would be no potential for damaging structures in areas surrounding the installation.

Speech Interference. With full implementation of Alternative 2, there would be an average of 360 aircraft operations at JBSA-Randolph and 130 aircraft operations at Seguin AAF each day, all of which would operate for some amount of time below altitudes that could interfere with speech inside buildings. Similar to the Proposed Action, a broader range of areas near the two installations would experience aircraft overflights that would range from loud to very loud exceeding 75 dBA L_{max} at any given point on the ground, interfering with communication for individuals beneath the aircrafts' flight paths.

Table 3-42 outlines the number of individual aircraft overflights above 50 dBA which are loud enough to interrupt communication within the representative residential areas and schools with the implementation of Alternative 2. The number of events loud enough to interfere with communication would increase in range to less than one to fifteen events per hour for representative locations around JBSA-Randolph, and from one to five events per hour for those near Seguin AAF. Other residential areas and schools in the immediate area of the installations would likely fall within this range. Figures depicting areas around the installations that would experience some amount of speech interference are in **Appendix C**.

Table 3-41. Overall Sound Levels at Representative Locations – Alternative 2

ID	Representative Location	Type	Overall Sound Level (dBA DNL)	
			Existing Conditions	Alternative 2
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	54	64
2	FM1518 and Abbott Road	Residential	55	**70**
3	Kitty Hawk Road and Toepperwein Road	Residential	45	51
4	Seguin Road and Crestway Drive	Residential	45	52
5	Kitty Hawk Road and Pat Booker Road	Residential	57	**66**
6	Roy Richard Drive and Green Valley Road	Residential	49	**66**
7	FM78 and FM1103	Residential	46	64
8	Samuel Clemens High School	School	59	**74**
9	Randolph High School	School	59	**67**
10	Olympia Elementary School	School	56	**70**
11	Kitty Hawk Middle School	School	52	59
12	Laura Ingalls Wilder Intermediate School	School	54	**69**
13	Copperfield Elementary School	School	61	65
14	Ray D Corbett Junior High School	School	58	**75**
15	Hebron Church	Worship	56	**70**
16	Saint Paul Church	Worship	47	63
17	Resurrection Baptist Church	Worship	**74**	**85**
18	The Hanmi Presbyterian Church	Worship	57	**69**
19	Greater Randolph Seventh Day Adventist Church	Worship	**73**	**85**
20	Universal City United Methodist Church	Worship	59	**75**
21	Faith Apostolic Church	Worship	**68**	**78**
22	Church of Christ Schertz	Worship	60	**76**
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	41	56
2	Windbrook Subdivision	Residential	58	**70**
3	Sunbelt Road	Residential	62	**72**
4	Aux Airport Road and Oak Hill Drive	Residential	**67**	**77**
5	Southwest Preparatory School	School	63	**74**
6	Seguin Christian Academy	School	52	64
7	Seguin High School	School	43	57
8	Jim Barnes Middle School	School	40	55
9	Grace Family Bible Church	Worship	64	**74**

Source: DAF 2020b

Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.

Bolded sound levels indicate incompatible land uses.

Table 3-42. Number of Events Loud Enough to Interfere with Speech – Alternative 2

ID	Representative Location	Type	Number of Events Loud Enough to Interfere with Speech (events/hour)	
			Existing Conditions	Alternative 2
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	<1	6
2	FM1518 and Abbott Road	Residential	2	6
3	Kitty Hawk Road and Toepperwein Road	Residential	<1	1
4	Seguin Road and Crestway Drive	Residential	<1	<1
5	Kitty Hawk Road and Pat Booker Road	Residential	5	8
6	Roy Richard Drive and Green Valley Road	Residential	<1	2
7	FM78 and FM1103	Residential	<1	4
8	Samuel Clemens High School	School	3	14
9	Randolph High School	School	<1	12
10	Olympia Elementary School	School	1	2
11	Kitty Hawk Middle School	School	<1	2
12	Laura Ingalls Wilder Intermediate School	School	<1	6
13	Copperfield Elementary School	School	5	15
14	Ray D Corbett Junior High School	School	5	12
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	<1	1
2	Windbrook Subdivision	Residential	1	5
3	Sunbelt Road	Residential	1	3
4	Aux Airport Road and Oak Hill Drive	Residential	3	4
5	Southwest Preparatory School	School	1	5
6	Seguin Christian Academy	School	<1	3
7	Seguin High School	School	<1	1
8	Jim Barnes Middle School	School	<1	4

Sources: DAF 2020b and DNWG 2009a
Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.
Residential areas assessed for a 15-hour day (7 a.m. to 10 p.m.) and schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Table 3-43 outlines the number of minutes on average that class time would be above 50 dBA and interrupted by aircraft intrusions at the representative schools with the implementation of Alternative 2. The amount of time when aircraft would be loud enough to interfere with classroom communication would increase in range to between 2 and 50 minutes for representative schools around JBSA-Randolph, and between 2 and 8 minutes for representative schools around Seguin AAF. Other schools in the immediate area of the installations would likely fall within this range. Figures depicting the amount of class time loud enough to interfere with speech for areas around the installations are in **Appendix C**.

Table 3-43. Class Time Loud Enough to Interfere with Speech – Alternative 2

ID	Representative School	Time Loud Enough to Interfere with Classroom Communication (minutes/school day)	
		Existing Condition	Alternative 2
JBSA-Randolph			
8	Samuel Clemens High School	2.8	14.5
9	Randolph High School	<1.0	35.2
10	Olympia Elementary School	1.5	6.2
11	Kitty Hawk Middle School	<1.0	2.1
12	Laura Ingalls Wilder Intermediate School	<1.0	3.5
13	Copperfield Elementary School	4.6	32.0
14	Ray D Corbett Junior High School	4.7	50.0
Seguin AAF			
5	Southwest Preparatory School	1.8	8.0
6	Seguin Christian Academy	<1.0	3.7
7	Seguin High School	<1.0	1.9
8	Jim Barnes Middle School	<1.0	2.8

Sources: DAF 2020b and DNWG 2009a
Note: Schools assessed for an 8-hour day (8:00 a.m. to 4:00 p.m.)

Sleep Interference. With full implementation of Alternative 2, there would be an average of 18 aircraft operations at JBSA-Randolph each night (10 p.m. to 7 a.m.), all of which would operate for some amount of time below altitudes that could interfere with sleep inside buildings. The specified average number of operations noted would not likely occur in evenly spaced increments throughout the night, nor would they likely occur every night. Nighttime flights would occur as the training syllabus directs and would likely occur in "grouped" sessions meaning that several overflights may occur during a short period of time on one particular night, and there may be nights where no nighttime flying occurs. Due to scheduling changes, aircraft maintenance, weather, and other unpredictable events, it is not possible to forecast when nighttime events would occur; therefore, this analysis portrays the impact with operations averaged throughout the night, for each night. JBSA-Randolph would operate night flights in a manner to minimize nighttime aircraft noise to the community to the maximum extent practicable.

Table 3-44 outlines the probability of individuals in nearby representative residential areas awakening at least once, both with their windows closed and their windows open. Depending on individual flight patterns and power settings, aircraft overflights would awaken approximately 1 to 5 percent of individuals residing near the end of the runways and under closed patterns to the east of JBSA-Randolph on any given night. There are currently no nighttime T-38C air operations at JBSA-Randolph. There would be no nighttime operations at Seguin AAF with the implementation of Alternative 2. Nighttime aircraft operations currently occur at JBSA-Lackland for C-5 and F-16 aircraft. The additional proposed nighttime T-7A aircraft operations at JBSA-Lackland would be minor to the existing number of operations and would not significantly affect

current sleep interference impacts. Figures depicting the probability for sleep awakening for areas around the installations are in **Appendix C**.

The specified average number of operations noted would not likely occur in evenly spaced increments throughout the night, nor would they likely occur every night. Nighttime flights would occur as the training syllabus directs and would likely occur in "grouped" sessions meaning that several overflights may occur during a short period of time on one particular night, and there may be nights where no nighttime flying occurs. Due to scheduling changes, aircraft maintenance, weather, and other unpredictable events, it is not possible to forecast when nighttime events would occur; therefore, this analysis portrays the impact with operations averaged throughout the night, for each night. JBSA-Randolph would operate night flights in a manner to minimize nighttime aircraft noise to the community to the maximum extent practicable.

Table 3-44. Probability of Awakening at Least Once – Alternative 2

ID	Representative Location	Type	Probability of Awakening at Least Once % Windows Closed (% Windows Open)
1	Boeing Drive and Graytown Road	Residential	1.3% (2.1%)
2	FM1518 and Abbott Road	Residential	3.4% (5.3%)
3	Kitty Hawk Road and Toepperwein Road	Residential	<0.1% (<0.1%)
4	Seguin Road and Crestway Drive	Residential	<0.1% (<0.1%)
5	Kitty Hawk Road and Pat Booker Road	Residential	2.3% (3.6%)
6	Roy Richard Drive and Green Valley Road	Residential	2.0% (3.1%)
7	FM78 and FM1103	Residential	3.4% (5.3%)

Sources: DAF 2020b, DNWG 2009a, DNWG 2009b, and ANSI 2008
Note: Representative locations 1 through 7 are centralized intersections in residential areas and have been assessed for a 9-hour night (10 p.m. to 7 a.m.)

Potential for Hearing Loss. **Table 3-45** outlines the estimated number of residents with the potential for hearing loss with the implementation of Alternative 2. Based on aerial counts, there would be an estimated 769 houses near JBSA-Randolph exposed to Leq(24) greater than 80 dBA, and 2,276 residents with the potential for long-term (40 years) hearing loss. These residents live primarily on-base or near the northern installation boundary and would have a potential for noise induced hearing loss that ranged from 3 to 15 dBA. There would be an estimated 27 houses near Seguin AAF exposed to Leq(24) greater than 80 dBA, and 73 residents with the potential for long-term hearing loss. These residents live primarily north of the airfield and would have a potential for noise induced hearing loss that ranged from 3 to 10 dBA. This identified "potential" for hearing loss is strictly based upon the location of residences in relation to the predicted 80 dBA aircraft noise contour and does not represent a determination that all or any individuals will experience hearing loss. Residents would not likely be exposed to this level of noise for periods long enough to cause hearing loss as individuals leave the property for extensive periods to attend work, school, or other off-property activities. When at home and within the residence, the structure would normally provide sufficient noise suppression to lower aircraft noise levels far below the level that would lead to hearing loss.

Individual aircraft overflights at JBSA-Randolph and Seguin AAF would continue to not be supersonic and not generate sonic booms above 140 dB; therefore, no individuals would be exposed to instantaneous sound levels loud enough to damage hearing.

Table 3-45. Number of Residents with the Potential for Hearing Loss– Alternative 2

Average Sound Level (dBA Leq(24)	Noise Induced Hearing Loss (dB)		Estimated Number of Residents with the Potential for Hearing Loss			
			JBSA-Randolph			Seguin AAF
Contour	Average	10th Percentile	On-Base	Off-Base	Total	Total[a]
80–81	3.0	7.0	68	808	876	30
81–82	3.5	8.0	74	403	477	3
82–83	4.0	9.0	65	240	305	22
83–84	4.5	10.0	30	216	246	16
84–85	5.5	11.0	41	222	263	3
85–86	6.0	12.0	41	24	65	0
86–87	7.0	13.5	0	21	21	0
87–88	7.5	15.0	18	6	24	0
		Total	337	1,939	2,276	73

Sources: DAF 2020b and DNWG 2013
[a] There are no on-installation residents at Seguin AAF.

3.2.3.3.2 Airspace

3.2.3.3.2.1 Overall Aircraft Noise

Table 3-46 and **Figure 3-16** show the overall sound levels (i.e., DNL) for areas beneath the MOAs, MTRs, and R-6312 both with and without Alternative 2. The overall noise under the airspace would increase 7 to 29 dBA DNL depending on the airspace component, which is an appreciable change in the overall noise environment. The overall sound levels for all areas, other than R-6312, VR-140, and VR-156, would be less than 65 dBA DNL, and would remain compatible with all land uses. The overall sound levels at the ranges within R-6312, and under some segments of VR-140 and VR-156, would be greater than 65 dBA DNL and normally incompatible with sensitive land uses. There are a limited number of residences within R-6312 near the ranges which are considered existing incompatible land uses, and numerous residences below both VR-140 and VR-156 that would become incompatible with the overall noise with the implementation of Alternative 2.

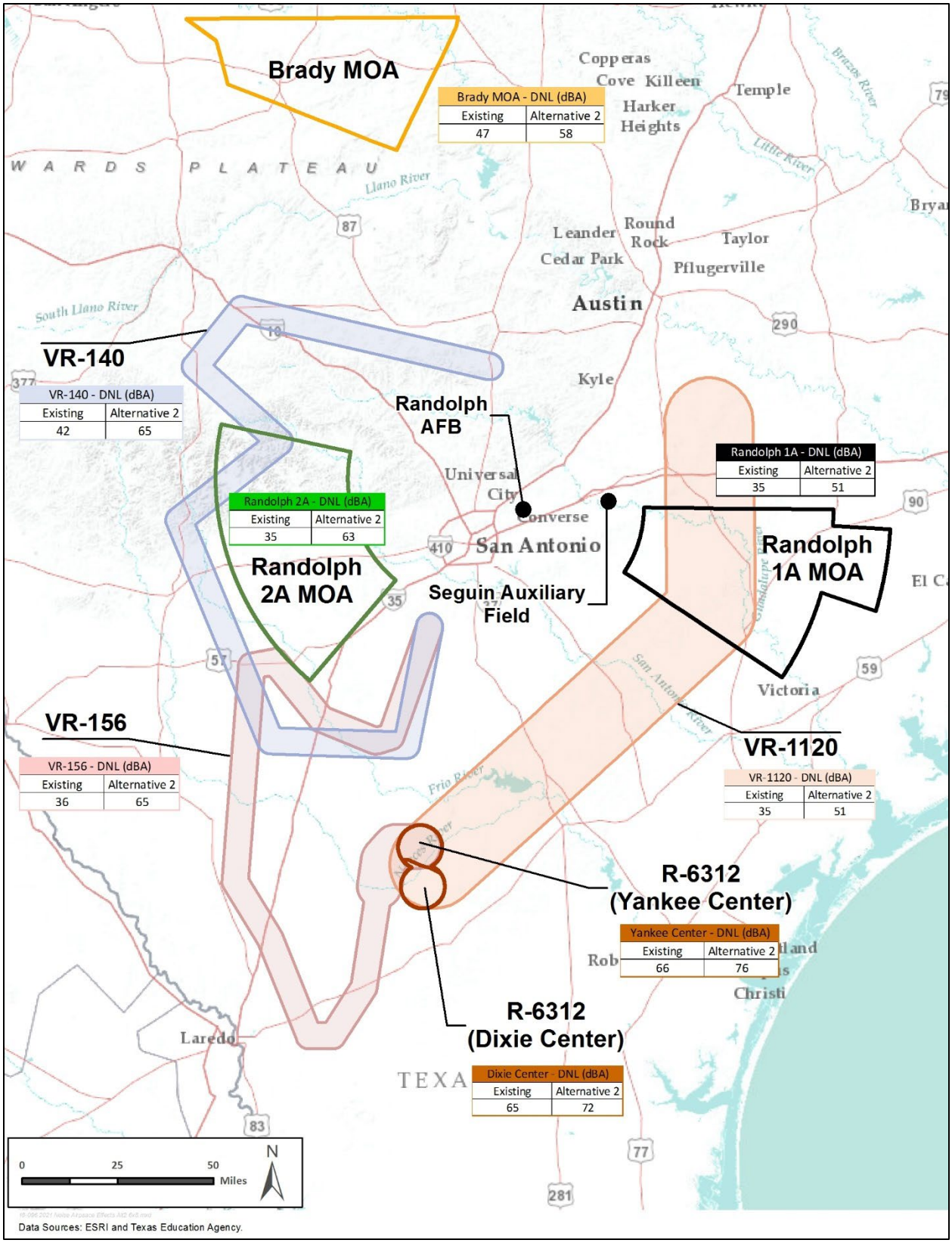
Table 3-46. Overall Sound Levels Beneath the Airspace – Alternative 2

Special Use Airspace	Altitudes	Overall Sound Level (dBA DNL)	
		Existing Conditions	Alternative 2
Randolph 1A MOA	8,000'–17,999' MSL	35	51
Randolph 2A MOA	9,000'–17,999' MSL	35	63
Brady MOA	500' AGL–17,999' MSL	47	58
R-6312 (Dixie Center)	Surface–23,000' MSL	65	72
R-6312 (Yankee Center)	Surface–23,000' MSL	66	76
VR-1120	100'–1,500' AGL	35	51
VR-140	500'–4,500' AGL	42	65
VR-156	Surface–3,000' AGL	36	65

Sources: DAF 2017a, DAF 2020b

3.2.3.3.2.2 Individual Aircraft Overflights.

Effects from individual overflights within the MOAs, MTRs, and R-6312 would be identical to those outlined under the Proposed Action, except there would be 6,792 annual operations (19 per day) within the airspace. The majority of operations would have flight components that would have some amount of speech interference for individuals below. These effects would continue to be distributed throughout areas beneath the airspace, and as outlined above, these events would be loud enough and frequent enough to create areas of incompatible land use under R-6312, and some segments of VR-140 and VR-156.



Source: DAF 2020b

Figure 3-16. Overall Aircraft Noise in Special Use Airspace – Alternative 2

3.2.3.4 Alternative 3

Alternative 3 would have short-term, minor and long-term, significant, adverse effects on the noise environment. Short-term effects would be due to noise generated by heavy equipment during construction and demolition, and the nature and overall level of these effects would be identical to those outlined under the Proposed Action. As with the Proposed Action, long-term effects would be due to the introduction of the louder T-7A aircraft, the increase in overall training operations, and the introduction of operations between 10 p.m. and 7 a.m. Long-term changes in operational noise would substantially increase areas of incompatible land use on and in the vicinity of JBSA-Randolph and Seguin AAF. Due to the limited number of operations, changes in noise at JBSA-Lackland would be negligible.

3.2.3.4.1 JBSA-Randolph, Seguin AAF, and JBSA-Lackland

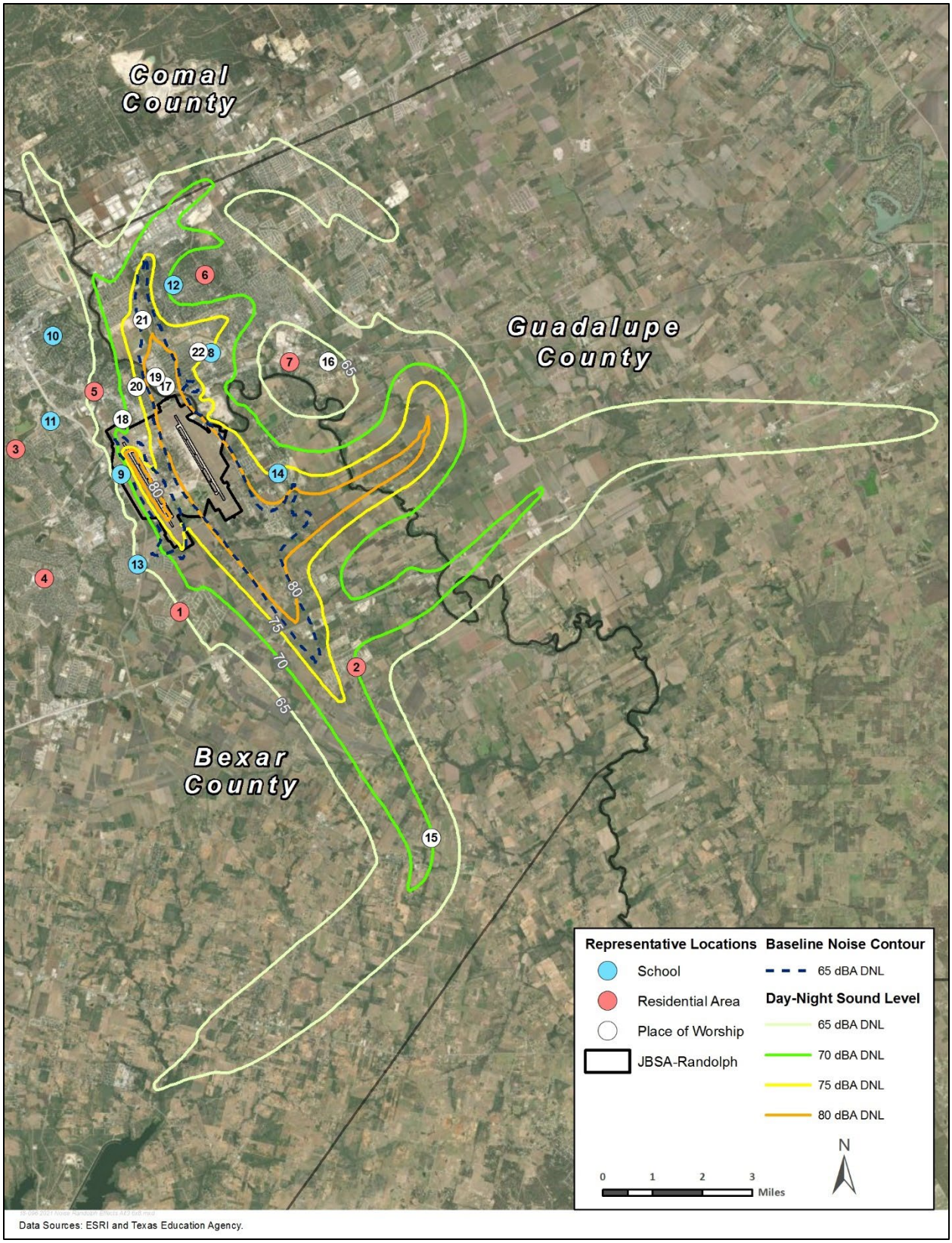
3.2.3.4.1.1 Overall Aircraft Noise

Noise levels on and in the vicinity to JBSA-Randolph and Seguin AAF were calculated with full implementation of Alternative 3. **Figure 3-17** and **Figure 3-18** show the base-wide DNL noise contours with and without the T-7A conversion. **Table 3-47** presents the land acreage and estimated population exposed to noise levels 65 dBA DNL or greater at JBSA-Randolph and Seguin AAF.

Similar to the Proposed Action, the 65, 70, 75, and 80 dBA DNL noise contours at JBSA-Randolph would expand appreciably in all directions when compared to the existing conditions. The off-installation areas surrounding JBSA-Randolph exposed to 65 dBA DNL or greater would increase from 3,065 acres to 55,140 acres and extend as far north as Northcliffe and as far south as Saint Hedwig. The estimated number of residents within the 65 dBA DNL contour would increase from 5,083 to 65,420. The off-installation areas surrounding Seguin AAF exposed to 65 dBA DNL or greater would increase from 2,002 acres to 12,515 acres and the estimated number of residents within them would increase from 417 to 3,184.

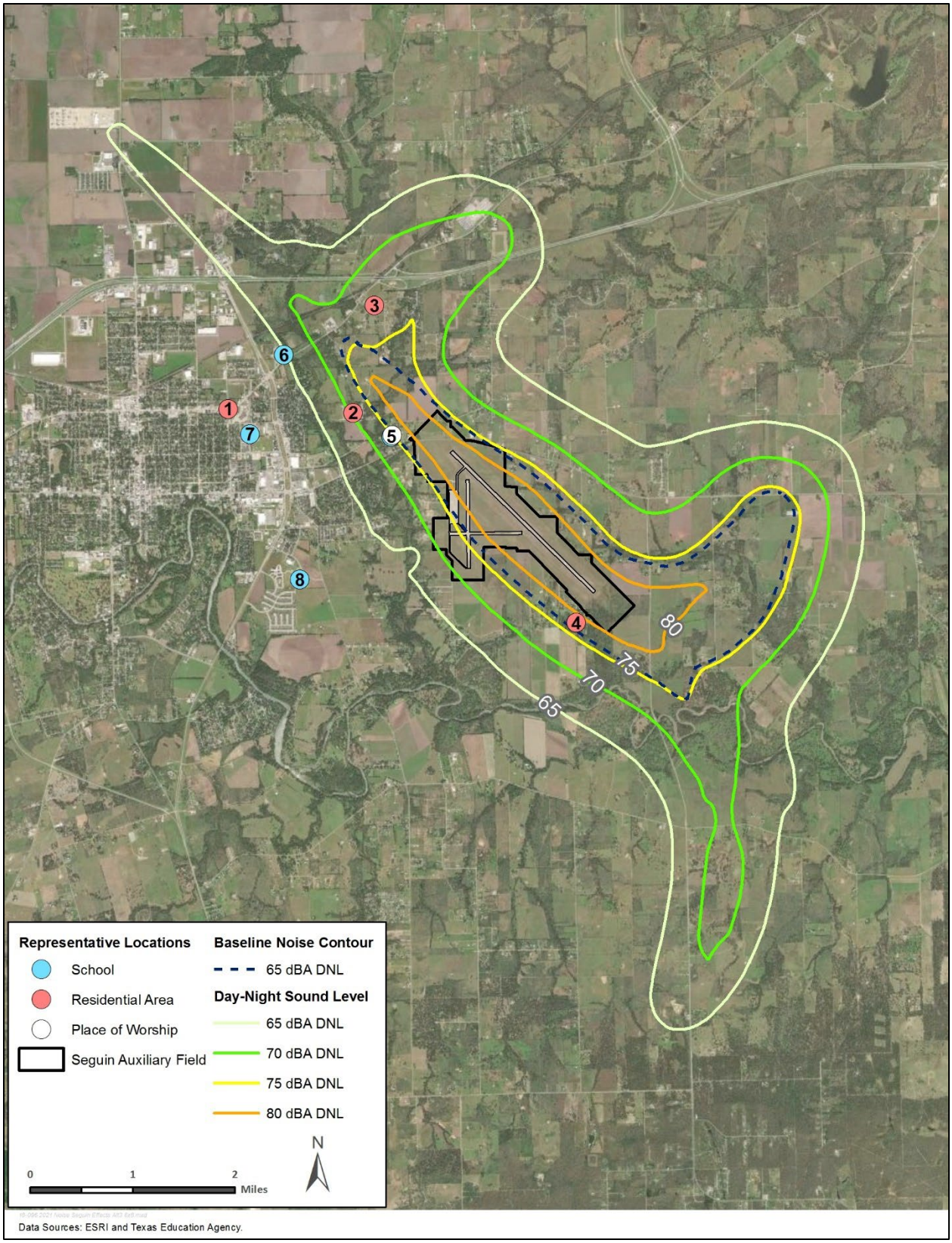
T-7A aircraft from JBSA-Randolph would account for approximately 1,398 operations per year or about 4 operations per day at JBSA-Lackland (i.e., approximately 2.0 percent of the total operations) (DAF 2019). The nature and overall level of effects from these overflights would be similar to, but slightly more than those outlined under the Proposed Action. As the T-7A would account for only 2.0 percent of the total operations, they would not contribute appreciably to the overall noise environment surrounding the base.

The noise contours developed in this EIS are based on the best available information at this time. Once the T-7A aircraft would begin to arrive at JBSA-Randolph, DAF would (1) analyze T-7A flying patterns and operational settings, (2) update the installation's AICUZ plan, and (3) support the community in developing a Joint Land Use Study for the installation and surrounding community. These actions would allow for more accurately predicting noise surrounding the installations and developing noise-specific mitigation measures.



Source: DAF 2020b

Figure 3-17. Noise Contours for JBSA-Randolph – Alternative 3



Source: DAF 2020b

Figure 3-18. Noise Contours for Seguin AAF – Alternative 3

Table 3-47. Areas and Estimated Population within Noise Contours – Alternative 3

Noise Contour (dBA DNL)	Area Under Contours (Acres)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	687	2,092	2,778	122	1,451	1,573
70–75	499	731	1,229	180	508	688
75–80	444	192	637	272	43	314
>80	482	22	503	252	0	252
Total	**2,111**	**3,036**	**5,148**	**824**	**2,002**	**2,826**
Alternative 3						
65–70	205	30,245	30,449	4	6,276	6,280
70–75	450	11,803	12,253	109	3,828	3,937
75–80	746	5,464	6,210	168	1,918	2,086
>80	1,511	3,255	4,766	684	494	1,178
Total	**2,917**	**55,140**	**58,056**	**966**	**12,515**	**13,481**
Change from Existing Conditions						
65–70	-485	32,509	32,024	-117	4,824	4,707
70–75	-69	11,080	11,012	-70	3,320	3,249
75–80	329	5,281	5,610	-103	1,875	1,772
>80	1,029	3,234	4,263	433	494	927
Total	**805**	**52,103**	**52,909**	**142**	**10,513**	**10,655**

Noise Contour (dBA DNL)	Estimated Population (Individuals)					
	JBSA-Randolph			Seguin AAF		
	On-Base	Off-Base	Total	On-Base	Off-Base	Total
Existing Conditions						
65–70	278	3,359	3,637	25	302	327
70–75	192	1,563	1,755	37	106	143
75–80	187	149	336	56	9	65
>80	196	12	208	52	0	52
Total	**853**	**5,083**	**5,936**	**170**	**417**	**587**
Alternative 3						
65–70	115	37,439	37,554	1	2,075	2,076
70–75	182	15,699	15,881	23	709	732
75–80	301	8,588	8,889	35	399	434
>80	619	3,694	4,313	86	1	87
Total	**1,217**	**65,420**	**66,637**	**145**	**3,184**	**3,329**
Change from Existing Conditions						
65-70	-163	34,080	33,917	-24	1,773	1,749
70-75	-10	14,136	14,126	-14	603	589
75-80	114	8,439	8,553	-21	390	369
>80	423	3,682	4,105	34	1	35
Total	**364**	**60,337**	**60,701**	**-25**	**2,767**	**2,742**

Note: Estimated population based on area within individual census blocks.
Sources: DAF 2020b and U.S. Census Bureau 2018

3.2.3.4.1.2 Individual Overflight Noise

The nature and overall levels of noise from individual T-7A overflights would be similar to those outlined under the Proposed Action; however, there would be 15 percent more operations. T-7A overflights would incrementally increase as T-38Cs were phased out, and individual acoustical events would increase in duration, level, and frequency when compared to existing conditions. As with existing conditions, and for similar reasons, aircraft overflights would not generate individual acoustic events loud enough to damage hearing or structures.

Representative Locations. **Table 3-48** lists the overall sound levels (i.e., DNL) for the representative locations around JBSA-Randolph and Seguin AAF with the implementation of Alternative 3. The number of representative locations exposed to overall sound levels greater than 65 dBA DNL near JBSA-Randolph and Seguin AAF would increase from four to twenty when compared to existing conditions. Fifteen out of the twenty-two representative locations near JBSA-Randolph would be exposed to overall sound levels greater than 65 dBA DNL, including three out of the seven residential areas, five out of the six schools, and seven of the eight places of worship. Five out of the nine representative locations near Seguin AAF would be exposed to overall sound levels greater than 65 dBA DNL, including three of the four residential areas, one out of the four schools, and the place of worship. All other representative residential areas, schools, and places of worship at both installations would be exposed to overall noise levels less than 65 dBA DNL.

3.2.3.4.1.3 Individual Overflight Noise

With the implementation of Alternative 3, the nature and overall levels of noise from individual T-7A overflights would be similar to those outlined under the Proposed Action; however, there would be approximately 25 percent more operations. An assessment of speech interference, sleep interference, and potential for hearing loss are provided below. As with the Proposed Action and for similar reasons, there would be no potential for damaging structures in areas surrounding the installation.

Speech Interference. With full implementation of Alternative 3, there would be an average of 391 aircraft operations at JBSA-Randolph and 141 aircraft operations at Seguin AAF each day, all of which would operate for some amount of time below altitudes that could interfere with speech inside buildings. Similar to the Proposed Action, a broader range of areas near the two installations would intermittently experience aircraft overflights that would range from loud to very loud exceeding 75 dBA L_{max} at any given point on the ground, interfering with communication for individuals beneath the aircrafts' flight paths.

Table 3-49 outlines the number of individual aircraft overflights above 50 dBA which are loud enough to interrupt communication within the representative residential areas and schools with the implementation of Alternative 3. The number of events loud enough to interfere with communication would increase in range to one to fifteen events per hour for representative locations around JBSA-Randolph, and from one to five events per hour for those near Seguin AAF. Other residential areas and schools in the immediate area of the installations would likely fall within this range. Figures depicting areas around the installations that would experience some amount of speech interference are in **Appendix C**.

Table 3-48. Overall Sound Levels at Representative Locations – Alternative 3

ID	Representative Location	Type	Overall Sound Level (dBA DNL)	
			Existing Conditions	Alternative 3
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	54	65
2	FM1518 and Abbott Road	Residential	55	**70**
3	Kitty Hawk Road and Toepperwein Road	Residential	45	52
4	Seguin Road and Crestway Drive	Residential	45	52
5	Kitty Hawk Road and Pat Booker Road	Residential	57	**66**
6	Roy Richard Drive and Green Valley Road	Residential	49	**66**
7	FM78 and FM1103	Residential	46	65
8	Samuel Clemens High School	School	59	**75**
9	Randolph High School	School	59	**68**
10	Olympia Elementary School	School	56	**70**
11	Kitty Hawk Middle School	School	52	60
12	Laura Ingalls Wilder Intermediate School	School	54	**69**
13	Copperfield Elementary School	School	61	65
14	Ray D Corbett Junior High School	School	58	**75**
15	Hebron Church	Worship	56	**70**
16	Saint Paul Church	Worship	47	64
17	Resurrection Baptist Church	Worship	**74**	**86**
18	The Hanmi Presbyterian Church	Worship	57	**69**
19	Greater Randolph Seventh Day Adventist Church	Worship	**73**	**85**
20	Universal City United Methodist Church	Worship	59	**75**
21	Faith Apostolic Church	Worship	**68**	**78**
22	Church of Christ Schertz	Worship	60	**76**
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	41	56
2	Windbrook Subdivision	Residential	58	**70**
3	Sunbelt Road	Residential	62	**73**
4	Aux Airport Road and Oak Hill Drive	Residential	**67**	**78**
5	Southwest Preparatory School	School	63	**74**
6	Seguin Christian Academy	School	52	65
7	Seguin High School	School	43	57
8	Jim Barnes Middle School	School	40	55
9	Grace Family Bible Church	Worship	64	**75**

Source: DAF 2020b

Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.

Bolded sound levels indicate incompatible land uses.

Table 3-49. Number of Events Loud Enough to Interfere with Speech – Alternative 3

ID	Representative Location	Type	Number of Events Loud Enough to Interfere with Speech (events/hour)	
			Existing Conditions	Alternative 3
JBSA-Randolph				
1	Boeing Drive and Graytown Road	Residential	<1	7
2	FM1518 and Abbott Road	Residential	2	6
3	Kitty Hawk Road and Toepperwein Road	Residential	<1	1
4	Seguin Road and Crestway Drive	Residential	<1	0
5	Kitty Hawk Road and Pat Booker Road	Residential	5	8
6	Roy Richard Drive and Green Valley Road	Residential	<1	2
7	FM78 and FM1103	Residential	<1	4
8	Samuel Clemens High School	School	3	15
9	Randolph High School	School	<1	13
10	Olympia Elementary School	School	1	3
11	Kitty Hawk Middle School	School	<1	2
12	Laura Ingalls Wilder Intermediate School	School	<1	6
13	Copperfield Elementary School	School	5	16
14	Ray D Corbett Junior High School	School	5	13
Seguin AAF				
1	E Kingsbury Street and N King Street	Residential	<1	1
2	Windbrook Subdivision	Residential	1	5
3	Sunbelt Road	Residential	1	3
4	Aux Airport Road and Oak Hill Drive	Residential	3	5
5	Southwest Preparatory School	School	1	5
6	Seguin Christian Academy	School	<1	3
7	Seguin High School	School	<1	1
8	Jim Barnes Middle School	School	<1	5

Sources: DAF 2020b and DNWG 2009a
Note: Representative locations 1 through 7 at JBSA-Randolph and 1 through 4 for Seguin AAF are centralized intersections in residential areas.
Residential areas assessed for a 15-hour day (7 a.m. to 10 p.m.) and schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Table 3-50 outlines the number of minutes on average that class time would be above 50 dBA and interrupted by aircraft intrusions at the representative schools with the implementation of Alternative 3. The amount of time when aircraft would be loud enough to interfere with classroom communication would increase in range to between 2 and 54 minutes for representative schools around JBSA-Randolph, and between 2 and 9 minutes for representative schools around Seguin AAF. Other schools in the immediate area of the installations would likely fall within this range. Figures depicting the amount of class time loud enough to interfere with speech for areas around the installations are in **Appendix C**.

Table 3-50. Class Time Loud Enough to Interfere with Speech – Alternative 3

ID	Representative School	Time Loud Enough to Interfere with Classroom Communication (minutes/school day)	
		Existing Conditions	Alternative 3
JBSA-Randolph			
8	Samuel Clemens High School	2.8	15.7
9	Randolph High School	<1.0	38.3
10	Olympia Elementary School	1.5	6.7
11	Kitty Hawk Middle School	<1.0	2.3
12	Laura Ingalls Wilder Intermediate School	<1.0	3.8
13	Copperfield Elementary School	4.6	34.4
14	Ray D Corbett Junior High School	4.7	54.3
Seguin AAF			
5	Southwest Preparatory School	1.8	8.7
6	Seguin Christian Academy	<1.0	4.0
7	Seguin High School	<1.0	2.0
8	Jim Barnes Middle School	<1.0	3.0

Sources: DAF 2020b and DNWG 2009a
Note: Schools assessed for an 8-hour day (8 a.m. to 4 p.m.)

Sleep Interference. With full implementation of Alternative 3, there would be an average of 19 aircraft operations at JBSA-Randolph each night (10 p.m. to 7 a.m.), all of which would operate for some amount of time below altitudes that could interfere with sleep inside buildings. **Table 3-51** outlines the probability of individuals in nearby representative residential areas awakening at least once, both with their windows closed and their windows open. Depending on individual flight patterns and power settings, aircraft overflights would awaken approximately 2 to 6 percent of individuals residing near the end of the runways and under closed patterns to the east of JBSA-Randolph on any given night. There are currently no nighttime T-38C air operations at JBSA-Randolph. There would be no nighttime operations at Seguin AAF. Nighttime aircraft operations currently occur at JBSA-Lackland for C-5 and F-16 aircraft. The additional proposed nighttime T-7A aircraft operations at JBSA-Lackland would be minor to the existing number of operations and would not significantly affect current sleep interference impacts. Figures depicting the probability for sleep awakening for areas around the installations are in **Appendix C**.

The specified average number of operations noted would not likely occur in evenly spaced increments throughout the night, nor would they likely occur every night. Nighttime flights would occur as the training syllabus directs and would likely occur in “grouped” sessions meaning that several overflights may occur during a short period of time on one particular night, and there may be nights where no nighttime flying occurs. Due to scheduling changes, aircraft maintenance, weather, and other unpredictable events, it is not possible to forecast when nighttime events would occur; therefore, this analysis portrays the impact with operations averaged throughout the night, for each night. JBSA-Randolph would operate night flights in a

manner to minimize nighttime aircraft noise to the community to the maximum extent practicable.

Potential for Hearing Loss. **Table 3-52** outlines the estimated number of residents with the potential for hearing loss with the implementation of Alternative 3. Based on aerial counts, there would be an estimated 907 houses near JBSA-Randolph exposed to Leq(24) greater than 80 dBA, and 2,685 residents with the potential for long-term (40 years) hearing loss. These residents live primarily on-installation or near the northern installation boundary and would have a potential for noise induced hearing loss that ranged from 3 to 17 dBA. There would be an estimated 28 houses near Seguin AAF exposed to Leq(24) greater than 80 dBA, and 75 residents with the potential for long-term hearing loss. These residents live primarily north of the airfield and would have a potential for noise induced hearing loss that ranged from 3 to 11 dBA. This identified "potential" for hearing loss is strictly based upon the location of residences in relation to the predicted 80 dBA aircraft noise contour and does not represent a determination that all or any individuals will experience hearing loss. Residents would not likely be exposed to this level of noise for periods long enough to cause hearing loss as individuals leave the property for extensive periods to attend work, school, or other off-property activities. When at home and within the residence, the structure would normally provide sufficient noise suppression to lower aircraft noise levels far below the level that would lead to hearing loss. Individual aircraft overflights at JBSA-Randolph and Seguin AAF would continue to not be supersonic and not generate sonic booms above 140 dB; therefore, no individuals would be exposed to instantaneous sound levels loud enough to damage hearing.

Table 3-51. Probability of Awakening at Least Once – Alternative 3

ID	Representative Location	Type	Probability of Awakening at Least Once % Windows Closed (% Windows Open)
1	Boeing Drive and Graytown Road	Residential	1.5% (2.3%)
2	FM1518 and Abbott Road	Residential	3.7% (5.8%)
3	Kitty Hawk Road and Toepperwein Road	Residential	<0.1% (<0.1%)
4	Seguin Road and Crestway Drive	Residential	<0.1% (<0.1%)
5	Kitty Hawk Road and Pat Booker Road	Residential	2.5% (3.9%)
6	Roy Richard Drive and Green Valley Road	Residential	2.2% (3.4%)
7	FM78 and FM1103	Residential	3.7% (5.7%)

Sources: DAF 2020b, DNWG 2009a, DNWG 2009b, and ANSI 2008.
Note: Representative locations 1 through 7 are centralized intersections in residential areas and have been assessed for a 9-hour night (10 p.m. to 7 a.m.)

Table 3-52. Number of Residents with the Potential for Hearing Loss– Alternative 3

Average Sound Level (dBA Leq(24)	Noise Induced Hearing Loss (dB)		Estimated Number of Residents with the Potential for Hearing Loss			
			JBSA-Randolph			Seguin AAF
Contour	Average	10th Percentile	On-Base	Off-Base	Total	Total[a]
80–81	3.0	7.0	74	918	992	27
81–82	3.5	8.0	68	583	651	5
82–83	4.0	9.0	74	234	308	16
83–84	4.5	10.0	30	243	272	16
84–85	5.5	11.0	50	255	305	11
85–86	6.0	12.0	47	59	107	0
86–87	7.0	13.5	0	21	21	0
87–88	7.5	15.0	9	9	18	0
88–89	8.5	16.5	9	3	12	0
		Total	361	2,324	2,685	75

Sources: DAF 2020b and DNWG 2013
[a] There are no on-installation residents at Seguin AAF.

3.2.3.4.2 Airspace

3.2.3.4.2.1 Overall Aircraft Noise.

Table 3-53 and **Figure 3-19** show the overall sound levels (i.e., DNL) for areas beneath the MOAs, MTRs, and R-6312 both with and without Alternative 3. The overall noise under the airspace would increase 7 to 30 dBA DNL depending on the airspace component, which is an appreciable change in the overall noise environment. The overall sound levels for all areas, other than R-6312, and segments of VR-140, and VR-156, would be less than 65 dBA DNL, and would remain compatible with all land uses. The overall sound levels at the ranges within R-6312, and under some segments of VR-140 and VR-156 would be greater than 65 dBA DNL, and normally incompatible with sensitive land uses. There are a limited number of residences within R-6312 near the ranges which are considered existing incompatible land uses, and numerous residences below both VR-140 and VR-156 that would become incompatible with the overall noise with the implementation of Alternative 3.

3.2.3.4.2.2 Individual Aircraft Overflights.

Effects from individual overflights within the MOAs, MTRs, and R-6312 would be identical to those outlined under the Proposed Action, except there would be 7,382 annual operations (20 per day) within the airspace. The majority of the operations would have flight components that would have some amount of speech interference for individuals below. These effects would continue to be distributed throughout areas beneath the airspace, and as outlined above, these events would be loud enough and frequent enough to create areas of incompatible land use under R-6312, and some segments of VR-140 and VR-156.

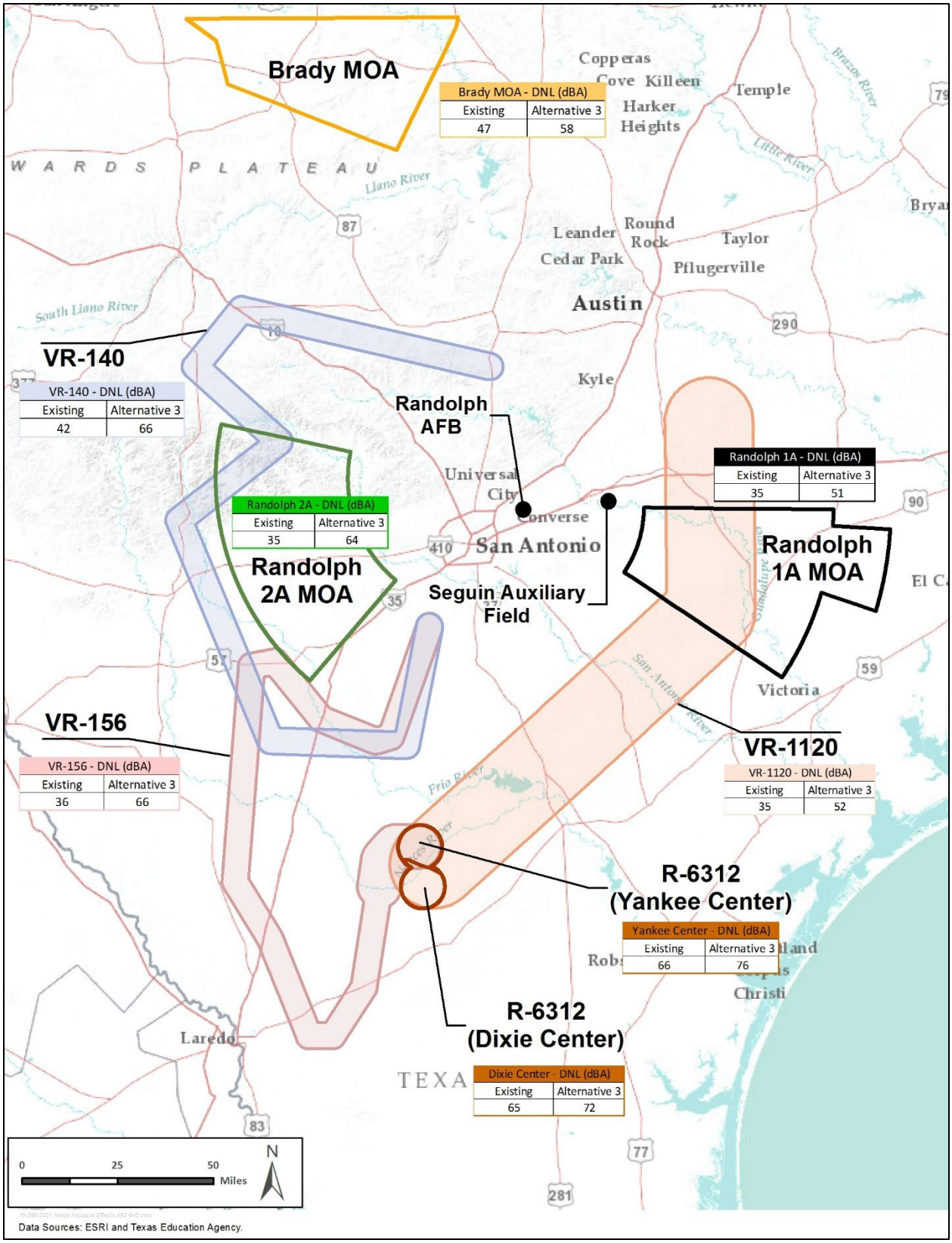
Table 3-53. Overall Sound Levels Beneath the Airspace – Alternative 3

Special Use Airspace	Altitudes	Overall Sound Level (dBA DNL)	
		Existing Conditions	Alternative 3
Randolph 1A MOA	8,000'–17,999' MSL	35	51
Randolph 2A MOA	9,000'–17,999' MSL	35	64
Brady MOA	500' AGL–17,999' MSL	47	58
R-6312 (Dixie Center)	Surface–23,000' MSL	65	72
R-6312 (Yankee Center)	Surface–23,000' MSL	66	76
VR-1120	100'–1,500' AGL	35	52
VR-140	500'–4,500' AGL	42	66
VR-156	Surface–3,000' AGL	36	66

Sources: DAF 2017a, DAF 2020b

3.2.3.5 No Action Alternative

The No Action Alternative would not result in impacts on the noise environment. No facility construction would occur, and there would be no changes in aircraft operations. Noise conditions would remain unchanged when compared to the existing conditions described in **Section 3.2.2**.



Source: DAF 2020b

Figure 3-19. Overall Aircraft Noise in Special Use Airspace – Alternative 3

3.2.4 Mitigation, Offsets, and Adaptive Management

3.2.4.1 Mitigation

The Proposed Action and the three other action alternatives would all result in larger DNL noise contours and noise exposure, encompassing a larger land area around both JBSA-Randolph and Seguin AAF. These changes to the DNL contours may result in changes to land use recommendations. Therefore, DAF will continue to work with Bexar and Guadalupe Counties, the City of Schertz, Universal City, Seguin, and other communities as needed to plan for compatible development, land use zoning, and building construction standards. Following a signed ROD for the Proposed Action, DAF commits to pursue the following measures:

- Prepare an AICUZ Update to address any increases of land area within the greater than 65 dBA DNL noise contours for both JBSA-Randolph and Seguin AAF.
- Fully implement the noise abatement strategies outlined in the 2015 JLUS.
- Coordinate with state and local agencies on compatible land use and potential encroachment concerns inside and outside of the DNL footprint (i.e., large-scale developments, transportation projects that could encourage development, or tall structures such as cell towers that could penetrate airfield imaginary surfaces.
- Encourage municipalities to promote the highest and best use of land by updating local zoning ordinances and building construction standards, especially for high-noise areas.
- Encourage municipalities to adopt legislative initiatives to acquire interest in developed properties in order to curb and mitigate encroachment near military installations and to protect the public from noise exposure and accident potential.
- DAF would consider avoidance of low-level flight over Sunday morning religious services (Saturday morning for churches that primarily have services on those days) over several church POIs as part of mitigation.

3.2.4.2 Offsets

As discussed in **Section 3.1.4.2**, there is a potential for the application of 27 tons of Early ERCs that would result in an increase in the number of aircraft operations in Alternative 1 (the *de minimis* alternative). If the 27 tons of Early ERCs were approved and applied, the number of allowable aircraft operations in year 2027 through 2032 would increase and remain constant after 2032. The initial years of T-38C and T-7A aircraft operations (2022 through 2026) would remain the same as the Proposed Action, as is currently shown in **Table 2-5**. **Figure 3-6** and **Figure 3-11** show noise contours surrounding JBSA-Randolph for the Proposed Action and Alternative 1, respectively. Noise contours for a modified number of operations associated with Alternative 1 would fall between the two aforementioned sets of contours: a little louder than Alternative 1 and slightly less than the Proposed Action. Based on the noise levels at representative locations shown in **Table 3-34**, noise levels are roughly 1 to 2 dB greater for the Proposed Action than for Alternative 1. For example, at Boeing Drive and Graytown Avenue, the Proposed Action is 64 dBA DNL and Alternative 1 is 62 dBA DNL. The noise levels would be within this range should the 27-ton Early ERCs be approved and applied to Alternative 1.

3.2.4.3 Adaptive Management

As previously discussed, DAF is applying an Adaptive Management strategy to further analyze, monitor, and update potential impacts for air quality and noise resources. Once DAF begins to receive T-7A aircraft into its inventory and initiate training with this aircraft at JBSA-Randolph, better defined training operation parameters will be established for this particular aircraft and DAF will be able to better define the impacts with greater accuracy. Further supporting this approach for adopting an Adaptive Management approach are the conclusions from a recent Department of the Navy Report to Congress noted in **Section 3.2.2.1.1**. This report compared the resulting measured sound levels of jet aircraft at Naval Air Station Whidbey Island and Naval Air Station Lemoore over a year's period to the DOD-approved noise models used for impact analysis (DON 2021). The report concluded that:

- Overall, the Navy determined that the DoD-approved noise models (NOISEMAP) operate as intended and provide an accurate prediction of noise exposure levels from aircraft operations for use in impact assessments and long-term land use planning, and
- There are two main variables that contribute to accurate noise modeling: a functioning model and accurate input data. These data include runway and flight track utilization, altitudes at various points in the flight track, and engine power settings among other parameters.

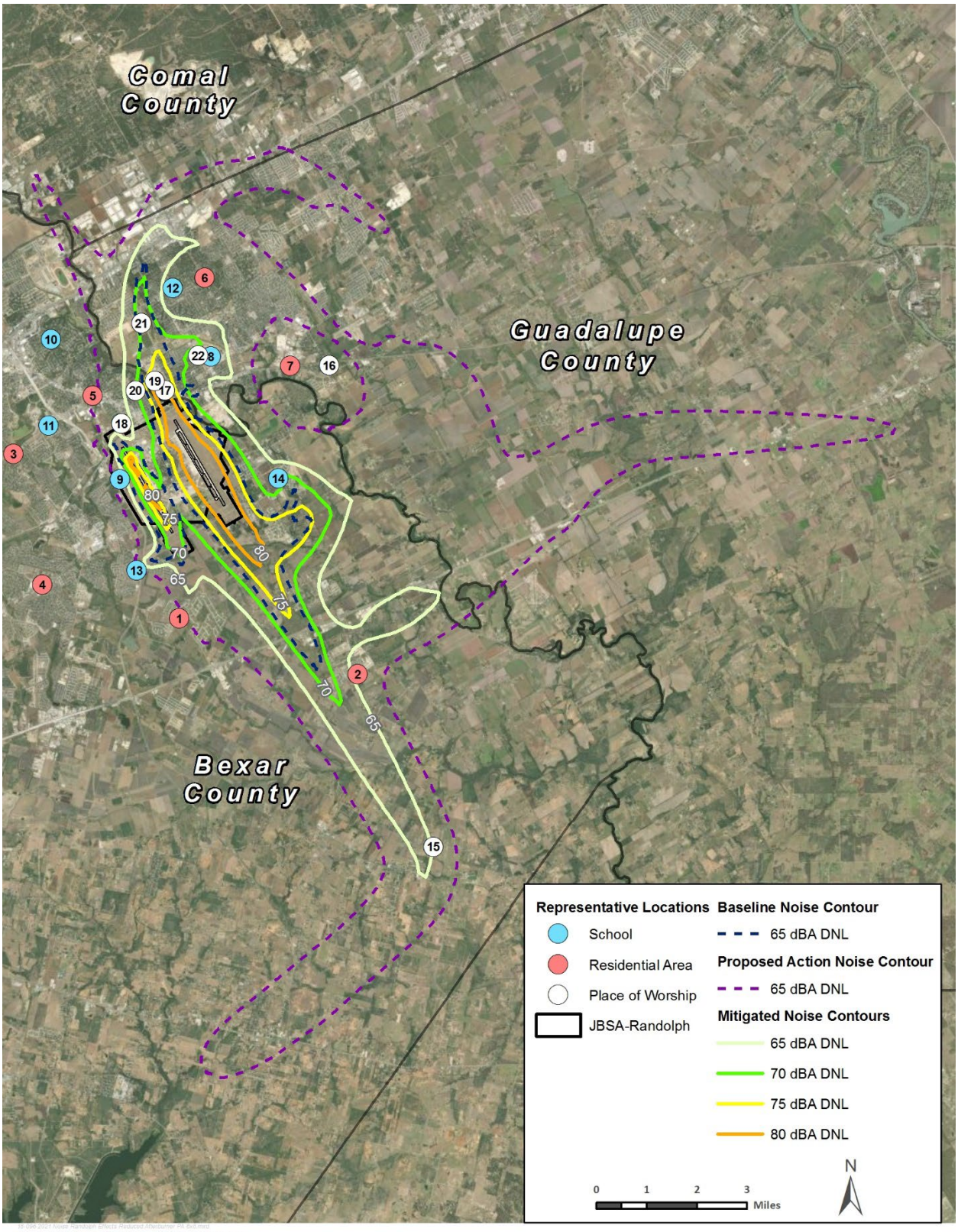
As DAF becomes familiar with the new T-7A aircraft and better defines the data variables noted above, inputs to the NOISEMAP model may be refined and more accurately defined impacts will become available.

More specific information regarding Adaptive Management and the proposed strategy is provided in **Appendix D**. Below is an analysis of the adjusted impacts applying the reduced power settings and afterburner use for the Proposed Action, Alternative 1, and Alternative 3. Alternative 2 was not carried forward for further analysis under adaptive management methods because the Proposed Action represents the DAF Preferred Alternative, Alternative 1 presents the minimum number of operations to meet training requirements, and Alternative 3 represents the maximum potential number of operations that would create the largest impacts.

3.2.4.3.1 Mitigated Proposed Action

As explained in **Section 3.2.3**, the noise analyses presented in **Section 3.2.3** utilized assumptions that the T-7A flight tracks, altitudes, and power settings to be the same as the T-38C operations. The T-7A aircraft has distinctly different operating characteristics than the T-38C that would be better understood once the T-7A aircraft arrive and begin operating at JBSA-Randolph. DAF has received preliminary T-7A operational data based on test flights indicating lower T-7A power settings than the T-38C's power settings would be likely. The preliminary T-7A operational data also indicates that the T-7A would likely require afterburner use for up to 5 percent of all takeoffs, substantially lower than the T-38C's requirement to use afterburner on 100 percent of takeoffs. To initiate analysis of an adaptive strategy to reduce the power settings accordingly, these preliminary T-7A operational settings were applied to the noise modelling for the Proposed Action's T-7A operations. **Figure 3-20** shows the DNL noise contours for the Proposed Action of T-7A operations incorporating these lower, T-7A power settings and 5 percent afterburner usage. As shown in the figure, the DNL contours are

substantially smaller than those shown in **Figure 3-6**, which assumed the T-7A would operate with the same settings as the T-38C.



Data Sources: ESRI and Texas Education Agency.

Figure 3-20. Noise Contours for Mitigated Proposed Action at JBSA-Randolph

Table 3-54 presents the land acreage exposed to noise levels 65-dBA DNL or greater at JBSA-Randolph with the implementation of the Proposed Action of T-7A operations incorporating the lower, preliminary T-7A power settings and 5 percent afterburner usage, as compared to the Proposed Action. With the lower, preliminary T-7A power settings, a total of 15,103 acres would be exposed to overall sound levels greater than 65 dBA DNL, an overall increase of 9,956 acres compared to the existing conditions, but a reduction of 33,757 acres when compared to the Proposed Action presented in **Section 3.2.3.1.1.2.**

Table 3-54. Area within Noise Contours at JBSA-Randolph for the Mitigated Proposed Action

Noise Contour (dBA DNL)	JBSA-Randolph		
	Proposed Action with Lower T-7A Power Settings (acres)	Change from Existing Conditions (acres)	Change from Proposed Action (acres)
65–70	8,004	+5,226	-21,175
70–75	3,940	+2,711	-6,234
75–80	1,918	+1,281	-3,606
>80	1,241	+738	-2,742
Total	**15,103**	**+9,956**	**-33,757**

Source: DAF 2020b

Table 3-55 lists the overall sound levels (i.e., DNL) for the representative locations around JBSA-Randolph with the implementation of the Proposed Action of T-7A operations incorporating the lower, preliminary T-7A power settings and 5 percent afterburner usage. **Table 3-55** also lists the corresponding change in DNL at the representative locations, as compared to the existing conditions and the Proposed Action of T-7A operations assuming the same T-38C power settings. With the lower, preliminary T-7A power settings, a total of nine representative locations would be exposed to overall sound levels greater than 65 dBA DNL, a reduction of five representative locations when compared to the Proposed Action presented in **Section 3.2.3.1.1.2.**

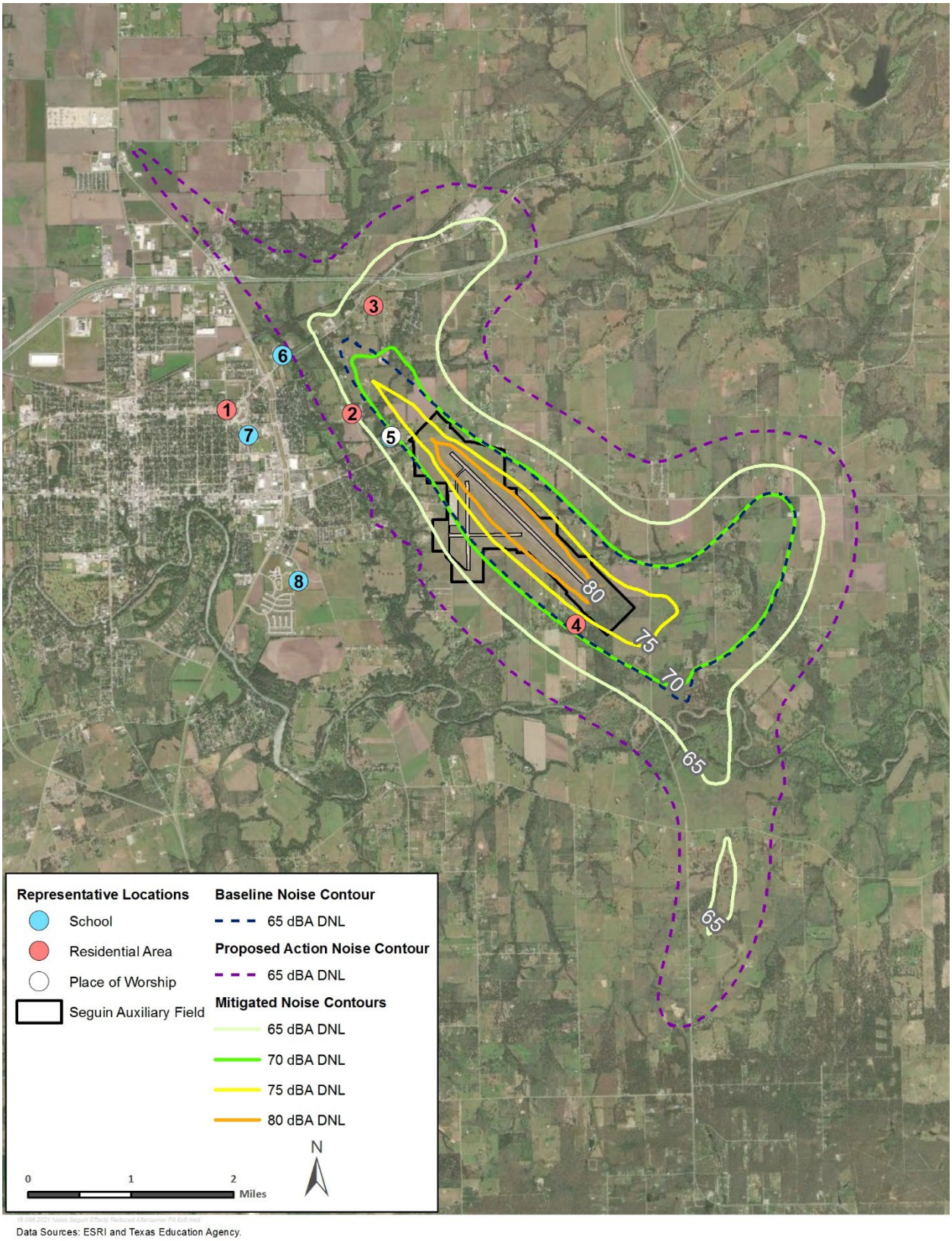
The DNL contours and sound levels would similarly be reduced around Seguin AAF with the Proposed Action of T-7A operations incorporating the lower, preliminary T-7A power settings and 5 percent afterburner usage. The resultant noise contour footprint for Seguin AAF with reduced power settings for the Proposed Action is shown in **Figure 3-21**. DAF would continue to determine the safest, most efficient, and least intrusive flight operations for T-7A training. Selection of specific mitigation measures, which could include a commitment to implement operational parameters that minimize noise impacts to the maximum extent practicable such as limiting afterburner takeoffs to 5 percent of all takeoffs, will be provided in the ROD. If the ROD commits to limiting afterburner takeoffs, specific local T-7A Squadron Operating Procedures would be written to ensure sufficient tracking and recording of afterburner use.

Table 3-55. Overall Sound Levels at Representative Locations – Mitigated Proposed Action

JBSA-Randolph					
ID	**Representative Location**	**Type**	**Proposed Action with Lower T-7A Power Settings (dBA DNL)**	**Change from Existing Conditions (dBA DNL)**	**Change from Proposed Action (dBA DNL)**
1	Boeing Drive and Graytown Road	Residential	59	+5	-5
2	FM1518 and Abbott Road	Residential	64	+9	-5
3	Kitty Hawk Road and Toepperwein Road	Residential	47	+2	-4
4	Seguin Road and Crestway Drive	Residential	47	+2	-4
5	Kitty Hawk Road and Pat Booker Road	Residential	60	+3	-5
6	Roy Richard Drive and Green Valley Road	Residential	59	+10	-6
7	FM78 and FM1103	Residential	56	+10	-8
8	Samuel Clemens High School	School	**68**	+9	-6
9	Randolph High School	School	63	+4	-4
10	Olympia Elementary School	School	**65**	+9	-4
11	Kitty Hawk Middle School	School	55	+3	-4
12	Laura Ingalls Wilder Intermediate School	School	62	+8	-6
13	Copperfield Elementary School	School	63	+2	-1
14	Ray D Corbett Junior High School	School	**68**	+10	-6
15	Hebron Church	Worship	**65**	+9	-4
16	Saint Paul Church	Worship	56	+9	-7
17	Resurrection Baptist Church	Worship	**80**	+6	-5
18	The Hanmi Presbyterian Church	Worship	63	+6	-5
19	Greater Randolph Seventh Day Adventist Church	Worship	**81**	+8	-3
20	Universal City United Methodist Church	Worship	**69**	+10	-5
21	Faith Apostolic Church	Worship	**72**	+4	-5
22	Church of Christ Schertz	Worship	**69**	+9	-6

Source: DAF 2020b

Note: Representative locations 1 through 7 at JBSA-Randolph are centralized intersections in residential areas.
Bolded sound levels indicate incompatible land uses.



Data Sources: ESRI and Texas Education Agency.

Figure 3-21. Noise Contours for Mitigated Proposed Action at Seguin AAF

Table 3-56 presents the land acreage exposed to noise levels 65-dBA DNL or greater at Seguin AAF with the implementation of the Proposed Action of T-7A operations incorporating the lower, preliminary T-7A power settings, as compared to the Proposed Action. With the lower, preliminary T-7A power settings, a total of 6,169 acres would be exposed to overall sound levels greater than 65 dBA DNL, an overall increase of 3,341 acres compared to the existing conditions, but a reduction of 5,792 acres when compared to the Proposed Action presented in **Section 3.2.3.1.1.2.**

Table 3-56. Area within Noise Contours at Seguin AAF for the Mitigated Proposed Action

Noise Contour (dBA DNL)	Seguin AAF		
	Mitigated Proposed Action (acres)	Change from Existing Conditions (acres)	Change from Proposed Action (acres)
65-70	3,343	+1,770	-2,486
70-75	1,849	+1,161	-1,463
75-80	620	+305	-1,243
>80	357	+105	-600
Total	**6,169**	**+3,341**	**-5,792**

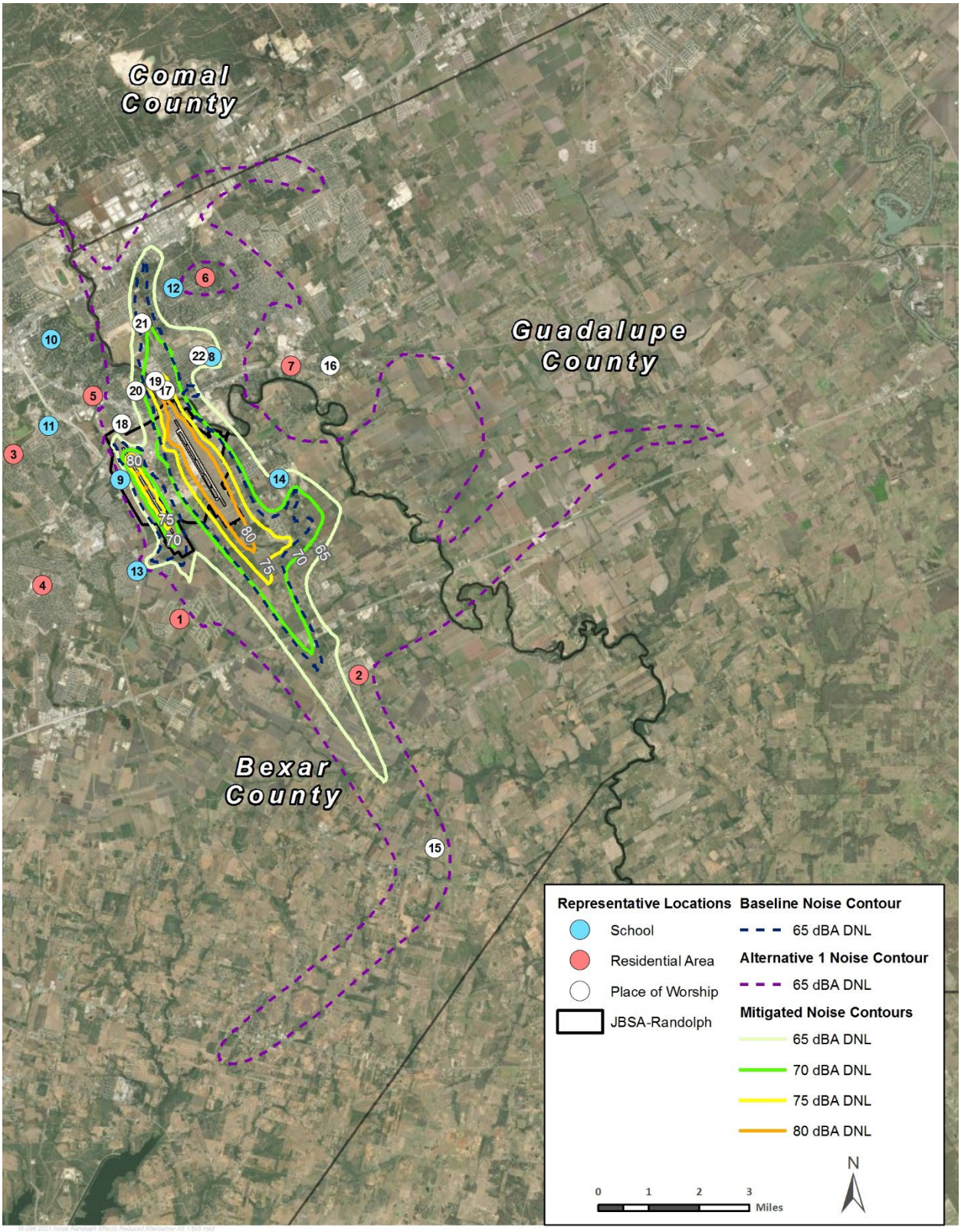
Source: DAF 2020b

3.2.4.3.2 Mitigated Alternative 1

As explained in **Section 3.1.4.3.2**, a Mitigated Alternative 1 has been developed with further scaled back operations than shown in **Table 2-5**, while incorporating the noise mitigation measure of reducing T-7A power settings and limiting afterburner use to 5 percent, in order to keep the annual net change in emissions below the 100 tpy GCR *de minimis* values for NO_X and VOCs. This section discusses the potential noise effects for this Mitigated Alternative 1. **Figure 3-22** shows the DNL noise contours for this Mitigated Alternative 1 at JBSA-Randolph.

Table 3-57 presents the land acreage exposed to noise levels 65-dBA DNL or greater at JBSA-Randolph for the Mitigated Alternative 1. For the Mitigated Alternative 1, a total of 10,428 acres would be exposed to overall sound levels greater than 65 dBA DNL, an overall increase of 5,281 acres compared to the existing conditions, but a reduction of 27,068 acres when compared to the original Alternative 1 presented in **Section 3.2.3.2.1.1.**

Table 3-58 lists the overall sound levels (i.e., DNL) for the representative locations around JBSA-Randolph for the Mitigated Alternative 1. **Table 3-58** also lists the corresponding change in DNL at the representative locations, as compared to the existing conditions and the original Alternative 1 that assumed the same T-38C power settings. For the Mitigated Alternative 1, a total of seven representative locations would be exposed to overall sound levels greater than 65 dBA DNL, a reduction of six representative locations when compared to the Alternative 1 presented in **Section 3.2.3.2.1.1.**



Data Sources: ESRI and Texas Education Agency.

Figure 3-22. Noise Contours for JBSA-Randolph – Mitigated Alternative 1

Table 3-57. Area within Noise Contours at JBSA-Randolph – Mitigated Alternative 1

Noise Contour (dBA DNL)	JBSA-Randolph		
	Mitigated Alternative 1 (acres)	Change from Existing Conditions (acres)	Change from Alternative 1 (acres)
65-70	5,629	+2,851	-16,560
70-75	2,767	+1,538	-5,201
75-80	1,224	+587	-3,192
>80	808	+305	-2,115
Total	**10,428**	**+5,281**	**-27,068**

Source: DAF 2020b

Table 3-58. Overall Sound Levels at Representative Locations at JBSA-Randolph – Mitigated Alternative 1

		JBSA-Randolph			
ID	Representative Location	Type	Mitigated Alternative 1 (dBA DNL)	Change from Existing Conditions (dBA DNL)	Change from Alternative 1 (dBA DNL)
1	Boeing Drive and Graytown Road	Residential	57	+3	-5
2	FM1518 and Abbott Road	Residential	61	+6	-6
3	Kitty Hawk Road and Toepperwein Road	Residential	46	+1	-4
4	Seguin Road and Crestway Drive	Residential	47	+2	-4
5	Kitty Hawk Road and Pat Booker Road	Residential	59	+2	-5
6	Roy Richard Drive and Green Valley Road	Residential	56	+7	-7
7	FM78 and FM1103	Residential	54	+8	-8
8	Samuel Clemens High School	School	**66**	+7	-6
9	Randolph High School	School	62	+3	-4
10	Olympia Elementary School	School	62	+6	-6
11	Kitty Hawk Middle School	School	54	+2	-4
12	Laura Ingalls Wilder Intermediate School	School	59	+5	-7
13	Copperfield Elementary School	School	63	+2	-1
14	Ray D Corbett Junior High School	School	**66**	+8	-7
15	Hebron Church	Worship	62	+6	-6
16	Saint Paul Church	Worship	54	+7	-7
17	Resurrection Baptist Church	Worship	**78**	+4	-5
18	The Hanmi Presbyterian Church	Worship	61	+4	-6
19	Greater Randolph Seventh Day Adventist Church	Worship	**79**	+6	-3
20	Universal City United Methodist Church	Worship	**67**	+8	-5
21	Faith Apostolic Church	Worship	**69**	+1	-7
22	Church of Christ Schertz	Worship	**66**	+6	-7

Source: DAF 2020c

Note: Representative locations 1 through 7 at JBSA-Randolph are centralized intersections in residential areas.
Bolded sound levels indicate incompatible land uses.

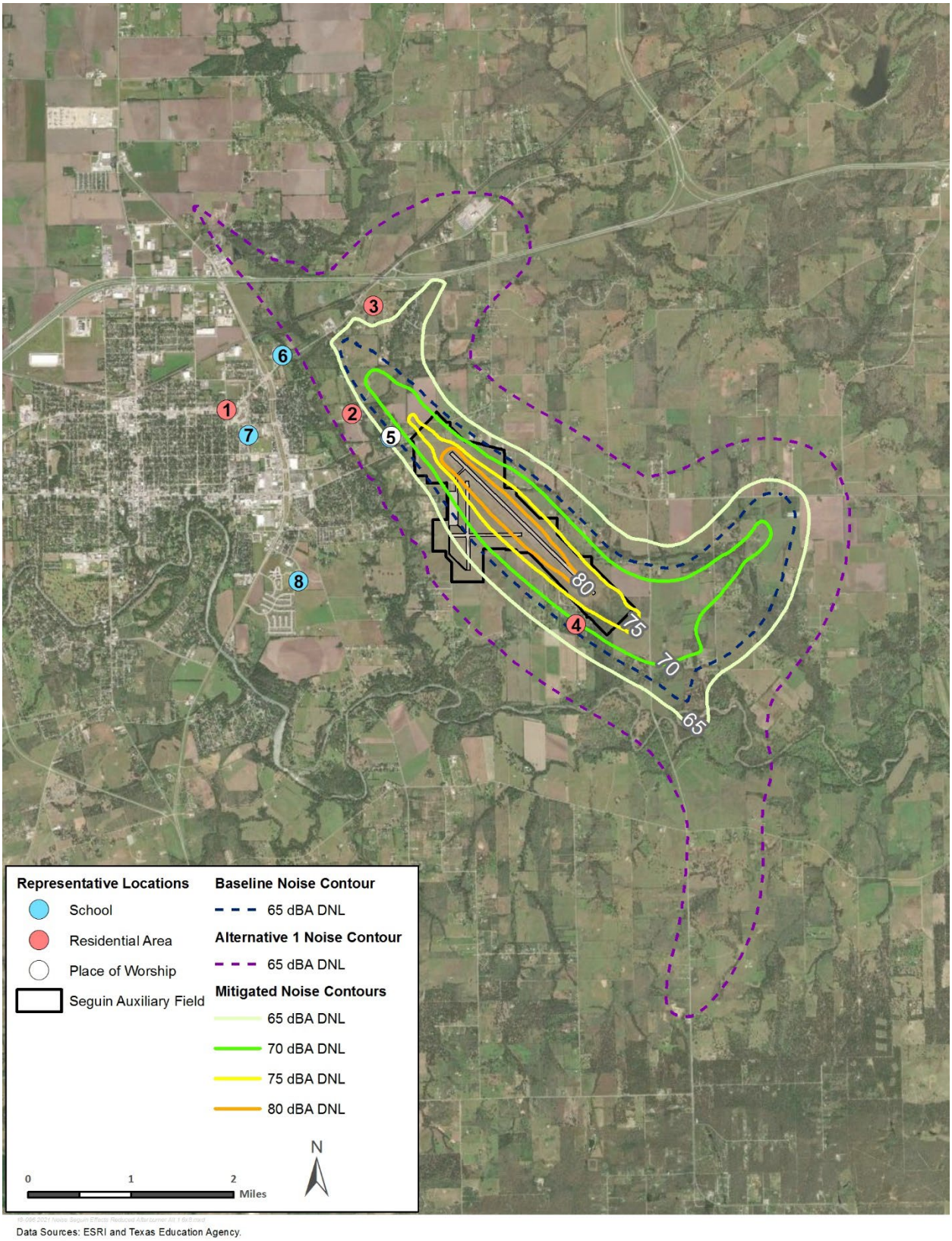
The DNL contours and sound levels would similarly be reduced around Seguin AAF with Alternative 1 of T-7A operations incorporating the lower, T-7A power settings and adjusted number of operations. The resultant noise contour footprint for Seguin AAF with reduced power settings for the Alternative 1 is shown in **Figure 3-23**.

Table 3-59 presents the Mitigated Alternative 1 land acreage exposed to noise levels 65-dBA DNL or greater at Seguin AAF with the implementation of Alternative 1 of T-7A operations incorporating the lower, T-7A power settings and number of operations, as compared to Alternative 1. With the lower, preliminary T-7A power settings, a total of 4,132 acres would be exposed to overall sound levels greater than 65 dBA DNL, an overall increase of 1,307 acres compared to the existing conditions, but a reduction of 6,494 acres when compared to the Proposed Action presented in **Section 3.2.3.1.1.2.**

Table 3-59. Area within Noise Contours at Seguin AAF – Mitigated Alternative 1

Noise Contour (dBA DNL)	Sequin AAF		
	Mitigated Alternative 1 (acres)	Change from Existing Conditions (acres)	Change from Alternative 1 (acres)
65-70	2,422	+849	-2,970
70-75	1,107	+420	-1,773
75-80	374	+60	-1,200
>80	229	-22	-551
Total	**4,132**	**+1,307**	**-6,494**

Source: DAF 2020b



Data Sources: ESRI and Texas Education Agency.

Figure 3-23. Noise Contours for Mitigated Alternative 1 at Seguin AAF

3.2.4.3.3 Mitigated Alternative 3

This section discusses the potential noise effects for a Mitigated Alternative 3, which includes the same number of T-7A operations presented as Alternative 3 in **Table 2-7**, but incorporates the noise mitigation measure of reducing T-7A power settings and limiting afterburner use to 5 percent. **Figure 3-24** shows the DNL noise contours for this Mitigated Alternative 3.

Table 3-60 presents the land acreage exposed to noise levels 65-dBA DNL or greater at JBSA-Randolph for the Mitigated Alternative 3. For the Mitigated Alternative 3, a total of 18,068 acres would be exposed to overall sound levels greater than 65 dBA DNL, an overall increase of 12,921 acres compared to the existing conditions, but a reduction of 35,610 acres when compared to the original Alternative 3 presented in **Section 3.2.3.4.1.1.**

Table 3-60. Area within Noise Contours at JBSA-Randolph – Mitigated Alternative 3

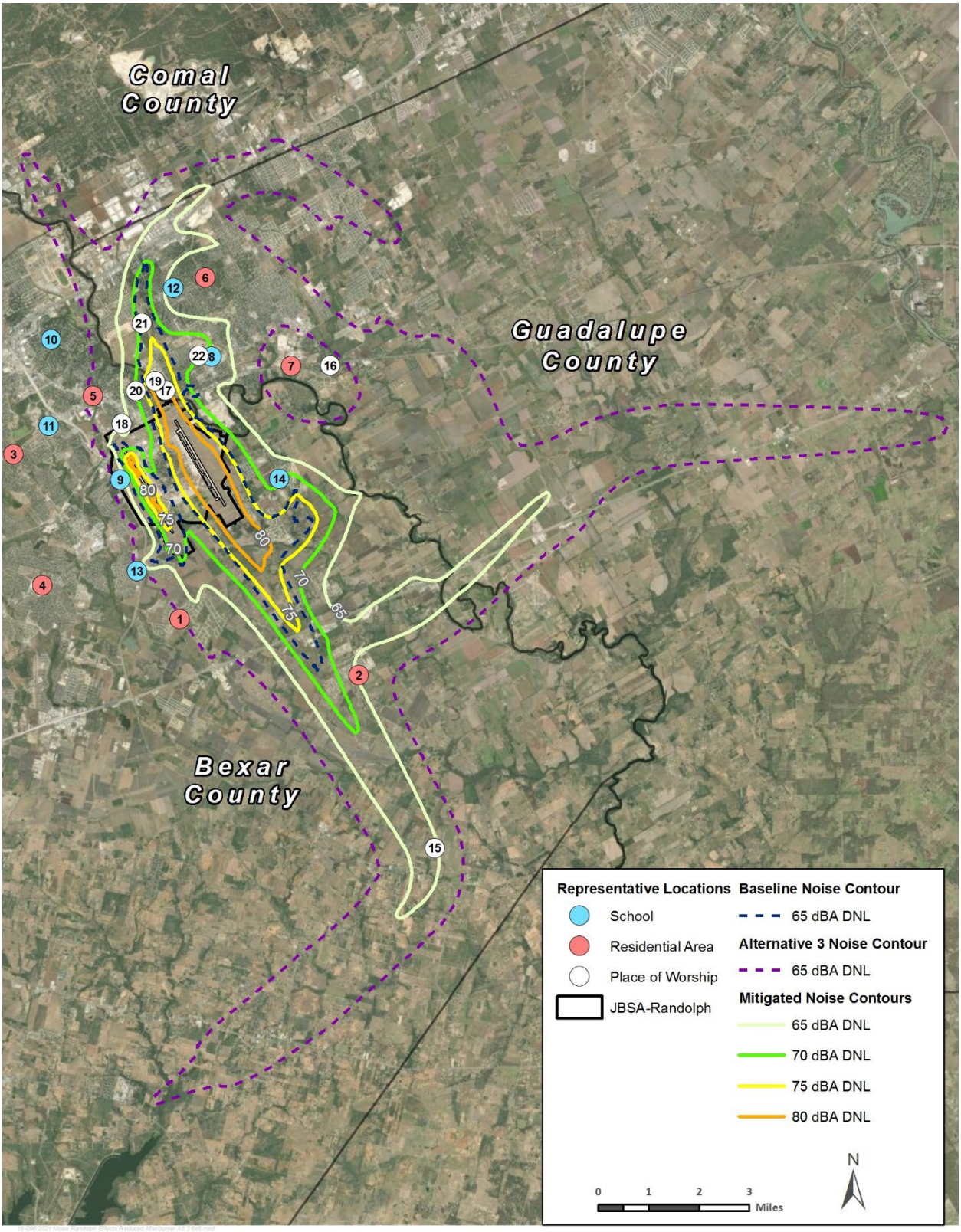
Noise Contour (dBA DNL)	JBSA-Randolph		
	Mitigated Alternative 3 (acres)	Change from Existing Conditions (acres)	Change from Alternative 3 (acres)
65-70	9,899	+7,121	-20,550
70-75	4,496	+3,267	-7,757
75-80	2,223	+1,586	-3,987
>80	1,450	+947	-3,316
Total	**18,068**	**+12,921**	**-35,610**

Source: DAF 2020b

Table 3-61 lists the overall sound levels (i.e., DNL) for the representative locations around JBSA-Randolph for the Mitigated Alternative 3. **Table 3-61** also lists the corresponding change in DNL at the representative locations, as compared to the existing conditions and the Alternative 3 that assumed the same T-38C power settings. For the Mitigated Alternative 3, a total of ten representative locations would be exposed to overall sound levels greater than 65 dBA DNL, a reduction of eight representative locations when compared to the Alternative 3 presented in **Section 3.2.3.4.1.1.**

The DNL contours and sound levels would similarly be reduced around Seguin AAF with Mitigated Alternative 3 of T-7A operations incorporating the lower, T-7A power settings. The resultant noise contour footprint for Seguin AAF with reduced power settings for the Mitigated Alternative 3 is shown in **Figure 3-25**.

Table 3-62 presents the Mitigated Alternative 3 land acreage exposed to noise levels 65-dBA DNL or greater at Seguin AAF with the implementation of Mitigated Alternative 3 of T-7A operations incorporating the lower, T-7A power settings and number of operations, as compared to Alternative 3. With the lower, preliminary T-7A power settings, a total of 7,108 acres would be exposed to overall sound levels greater than 65 dBA DNL, an overall increase of 4,282 acres compared to the existing conditions, but a reduction of 6,373 acres when compared to the Alternative 3 presented in **Section 3.2.3.4.1.1.**



Data Sources: ESRI and Texas Education Agency.

Figure 3-24. Noise Contours for JBSA-Randolph – Mitigated Alternative 3

Table 3-61. Overall Sound Levels at Representative Locations Around JBSA-Randolph – Mitigated Alternative 3

JBSA-Randolph					
ID	**Representative Location**	**Type**	**Mitigated Alternative 3 (dBA DNL)**	**Change from Existing Conditions (dBA DNL)**	**Change from Alternative 3 (dBA DNL)**
1	Boeing Drive and Graytown Road	Residential	59	+5	-6
2	FM1518 and Abbott Road	Residential	**65**	+10	-5
3	Kitty Hawk Road and Toepperwein Road	Residential	47	+2	-5
4	Seguin Road and Crestway Drive	Residential	47	+2	-5
5	Kitty Hawk Road and Pat Booker Road	Residential	60	+3	-6
6	Roy Richard Drive and Green Valley Road	Residential	60	+11	-6
7	FM78 and FM1103	Residential	57	+11	-8
8	Samuel Clemens High School	School	**69**	+10	-6
9	Randolph High School	School	63	+4	-5
10	Olympia Elementary School	School	**66**	+10	-4
11	Kitty Hawk Middle School	School	55	+3	-5
12	Laura Ingalls Wilder Intermediate School	School	63	+9	-6
13	Copperfield Elementary School	School	63	+2	-2
14	Ray D Corbett Junior High School	School	**69**	+11	-6
15	Hebron Church	Worship	**66**	+10	-4
16	Saint Paul Church	Worship	57	+10	-7
17	Resurrection Baptist Church	Worship	**81**	+7	-5
18	The Hanmi Presbyterian Church	Worship	64	+7	-5
19	Greater Randolph Seventh Day Adventist Church	Worship	**82**	+9	-3
20	Universal City United Methodist Church	Worship	**70**	+11	-5
21	Faith Apostolic Church	Worship	**73**	+5	-5
22	Church of Christ Schertz	Worship	**70**	+10	-6

Source: DAF 2020c
Note: Representative locations 1 through 7 at JBSA-Randolph are centralized intersections in residential areas.
Bolded sound levels indicate incompatible land uses.

Table 3-62. Area within Noise Contours at Seguin AAF – Mitigated Alternative 3

Noise Contour (dBA DNL)	**Seguin AAF**		
	Mitigated Alternative 3 (acres)	**Change from Existing Conditions (acres)**	**Change from Alternative 3 (acres)**
65-70	3,850	+2,277	-2,430
70-75	2,063	+1,375	-1,874
75-80	758	+444	-1,328
>80	437	+186	-741
Total	**7,108**	**+4,282**	**-6,373**

Source: DAF 2020b

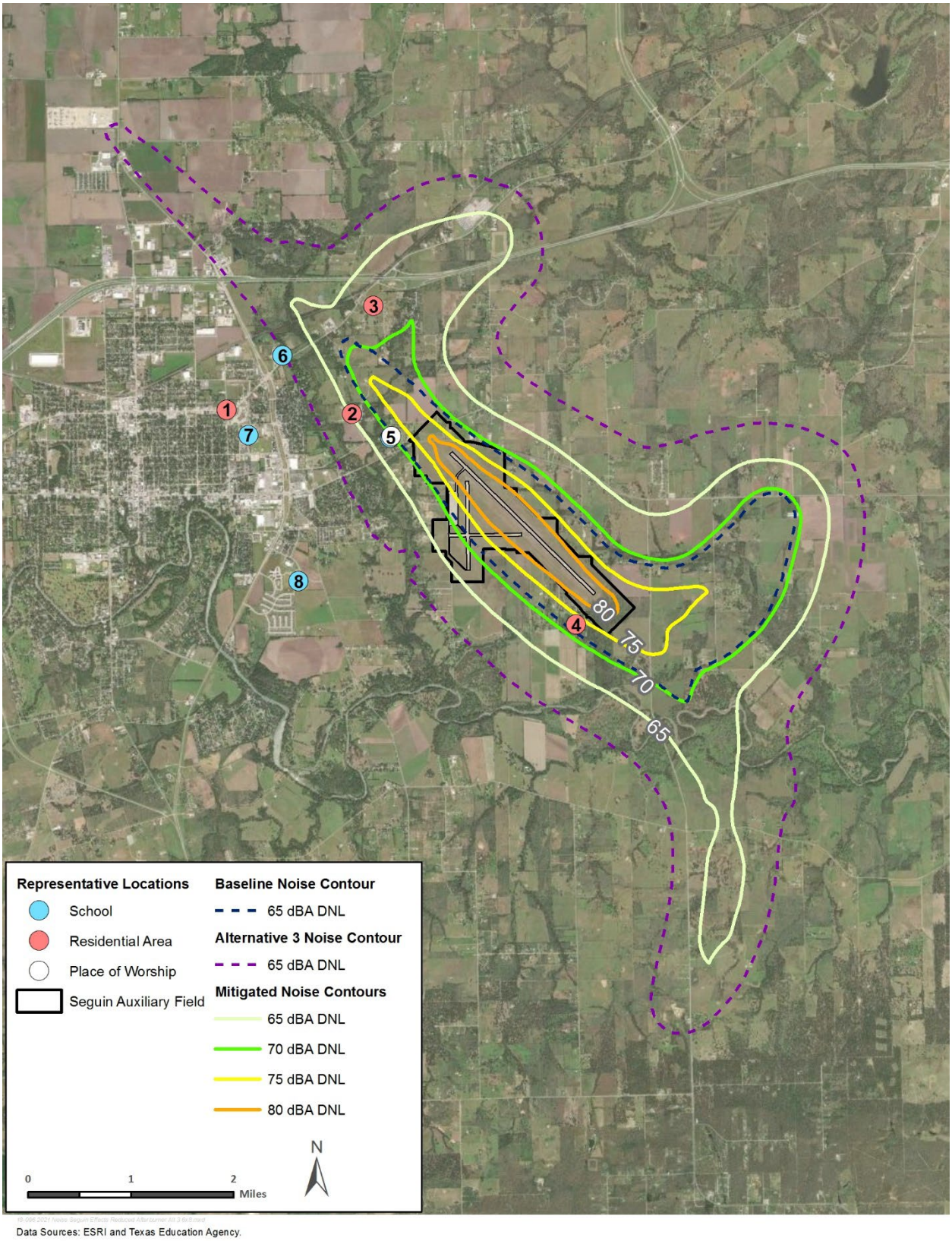


Figure 3-25. Noise Contours for Mitigated Alternative 3 at Seguin AAF

3.3 Biological Resources

3.3.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (e.g., grasslands, forests, wetlands) in which they exist. Protected and sensitive biological resources include Endangered Species Act (ESA) listed species (threatened or endangered) and those proposed for ESA-listing as designated by the U.S. Fish and Wildlife Service (USFWS) (terrestrial and freshwater organisms) and migratory birds. Migratory birds are protected species under the Migratory Bird Treaty Act (MBTA). Sensitive habitats include those areas designated or proposed by USFWS as critical habitat protected by the ESA and as sensitive ecological areas designated by state or other federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or limited in distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, and crucial summer and winter habitats).

Endangered Species Act. The ESA (16 USC § 1531 et seq.) established a federal program to protect and recover imperiled species and the ecosystems upon which they depend. The ESA requires federal agencies, in consultation with USFWS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Under the ESA, "jeopardy" occurs when an action is reasonably expected, directly or indirectly, to diminish numbers, reproduction, or distribution of a species so that the likelihood of survival and recovery in the wild is appreciably reduced. An "endangered species" is defined by the ESA as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined by the ESA as any species likely to become an endangered species in the foreseeable future. The ESA also prohibits any action that causes a "take" of any listed animal. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Listed plants are not protected from take, although it is illegal to collect or maliciously harm them on federal land.

Critical habitat is designated if USFWS determines that the habitat is essential to the conservation of a threatened or endangered species. Federal agencies must ensure that their activities do not adversely modify designated critical habitat to the point that it will no longer aid in the species' recovery.

Migratory Bird Treaty Act. The MBTA of 1918 (16 USC §§ 703–712), as amended, and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, require federal agencies to minimize or avoid impacts on migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to (or attempt to) pursue, hunt, take, capture, or kill any migratory bird, nest, or egg. Federal agencies with activities that could have measurable negative impacts on migratory birds are directed by EO 13186 to develop and implement an MOU with USFWS to promote the conservation of migratory bird populations.

Bald and Golden Eagle Protection Act. Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 USC §§ 668–668c), which prohibits the "take" of bald or golden eagles in the United States without a 50 CFR § 22.26 permit. The BGEPA

defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." For purposes of these guidelines, "disturb" means "to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause: (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

3.3.2 Affected Environment

The affected environment for biological resources consists of the land within JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas (i.e., McMullen Range, Brady MOAs, Randolph MOAs, VR140, VR143, VF156, VR1120, IR123, IR148, and IR149) (see **Table 3-1** and **Figure 1-5**) where T-7A would perform aircraft operations. For JBSA-Randolph, JBSA-Lackland, and Seguin AAF, avian/bat, terrestrial, and aquatic species within or near these installations have potential to be impacted from construction, aircraft takeoffs and landings, or aircraft operations and therefore are considered in this EIS. For the airspace areas, only avian/bat species have potential to be impacted during flight operations and, therefore, are considered in this EIS.

Vegetation. JBSA-Randolph is located in the Great Plains, South Central Semi-arid Prairies, Texas Blackland Prairies, and Northern Blackland Prairie. The historical vegetative cover in this area is tallgrass prairie. Most of JBSA-Randolph has been developed with buildings, streets, and runways to support the missions of the installation; very little native vegetation remains at JBSA-Randolph and little of the installation is undeveloped. Most vegetative cover consists of nonnative grass species including St. Augustine grass (*Stenotaphrum secundatum*), bermudagrass (*Cynodon dactylon*), and crabgrass (*Digitaria* spp.) (JBSA 2020).

JBSA-Lackland is located in the Great Plains, South Central Semi-arid Prairies, Texas Blackland Prairies, and Northern Blackland Prairie. Most of JBSA-Lackland is either developed space or improved turf. The remaining areas of natural vegetation include deciduous shrublands, riparian woodlands, and grasslands. Deciduous shrublands are dominated by native species including honey mesquite (*Prosopis glandulosa*), hackberry (*Celtis occidentalis*), granejo (*C. pallida*), and Eve's necklace (*Sophora affinis*). Riparian woodland areas are dominated by invasive species including chinaberry (*Melia azedarach*), Chinese tallow (*Triadica sebifera*), and privets (*Lingustrum* sp.). Native species include cedar elm (*Ulmus crassifolia*), black willow (*Salix nigra*), and netleaf hackberry (*Celtis laevigata*). Herbaceous cover is present in openings, but many of the grass species are nonnative (JBSA 2020).

Seguin AAF is located in the Great Plains, South Central Semi-arid Prairies, Texas Blackland Prairies, and Northern Blackland Prairie. There is very little native vegetation remaining on Seguin AAF. Undeveloped areas are dominated by mid- to tall-grass grassland composed primarily of nonnative pasture grasses such as Johnson grass (*Sorghum halepense*), King Ranch bluestem (*Bothriochloa ishchaemum*), and silky bluestem (*Dichanthium sericeum*) in the

summer and Texas wintergrass (*Stipa leucotricha*) in the winter. Most of the grassland areas experience routine maintenance and are mowed regularly. Woody species are limited to small sprouts of honey mesquite scattered throughout the area (JBSA 2020).

Wetlands do not occur within or near the areas affected by the Proposed Action and alternatives at any of these three JBSA installations. **Section 3.9** contains further details on wetlands.

Wildlife. The highly developed nature of JBSA-Randolph and JBSA-Lackland results in limited habitat to support wildlife species. Within the housing area of JBSA-Randolph, there are large trees that provide habitat for various birds and small mammal species. Riparian obligate species, including wading birds and waterfowl, frequent Woman Hollering Creek and the artificial ponds at the Randolph Oaks Golf Course located on the southern portion of the installation. Leon Creek flows through JBSA-Lackland, west of the airfield, which provides suitable habitat for various wildlife species as well as a riparian corridor for movement (JBSA 2020). Seguin AAF has a limited potential for biological diversity, as most of the area is maintained in accordance with airfield standards.

Urban-adapted species commonly observed throughout the three JBSA installations include the fox squirrel (*Sciurius niger*), cottontail rabbit (*Sylvilagus floridanus*), black-tailed jackrabbit (*Lepus californicus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), common gray fox (*Urocyon cinereoargenteus*), common grackle (*Quiscalus quicula*), great-tailed grackle (*Quiscalus mexicanus*), white-winged dove (*Zenaida asiatica*), northern mockingbird (*Mimus polyglottos*), and blue jay (*Cyanocitaa cristata*). Coyotes (*Canis latrans*) and white-tailed deer (*Odocoileus virginanus*) are also known to visit urban areas but are not considered to be primary species due to the absence of preferred habitat (JBSA 2020).

Bat species found throughout JBSA include the cave myotis (*Myotis velifer*), tri-colored bat (*Perimyotis subflavus*), and Mexican free-tail bat (*Tadarida brasiliensis*). Mexican free-tail bats have been observed foraging throughout JBSA; however, this species typically roosts in large colonies, up to the millions, and no caves large enough to support a colony have been found on JBSA (JBSA 2020). There are two known bat roosting locations in the San Antonio area—the Bracken Cave Preserve and Camden Street Bridge—as well as additional unknown roosting sites. These two locations contain some of the largest Mexican free-tailed bat roosting colonies in the state. Bats occur at these locations during the summer months (i.e., April to early October) (TPWD 2019). The Bracken Cave Preserve, with over 20 million bats roosting, is located approximately 10 miles north-northwest of the JBSA-Randolph airfield. Mexican free-tailed bats fly at altitudes around 2.0 miles (3,300 meters), which is the highest of all bats, and are known to travel up to 31 miles away from the roosting site and fly more than 100 miles per night. Mexican free-tailed bats spend around 60 percent of their active time foraging at heights of 20 to 49 feet (6 to 15 meters).

Non-native mammals that have been identified on JBSA include roof rat (*Rattus, rattus*) and house mouse (*Mus musculus*). These species were unintentionally introduced to JBSA from surrounding areas or escaped from private ranches and are now proliferating in the wild. In addition, feral dogs and cats are present throughout JBSA (JBSA 2020).

JBSA falls within the Central Flyway migratory route. The Central Flyway extends from northern Alaska, south through Canada, through the central United States, and through Texas into northern Mexico. Bird species present on JBSA can vary greatly depending on the time of year and which species are migrating through the vicinity. The Texas Parks and Wildlife Department (TPWD) lists 431 species of birds that are known to occur in the Edwards Plateau, including Bexar County (JBSA 2020).

Common avian species, many that are protected by the MBTA, found throughout the JBSA region include the loggerhead shrike (*Lanius ludovicianus*), western kingbird (*Tyrannus verticalis*), scissor-tailed flycatcher (*Tyrannus forficatus*), greater roadrunner (*Geococcyx californianus*), common ground dove (*Columbina passerine*), white-winged dove (*Zenaida asiatica*), mourning dove (*Z. macroura*), cattle egret (*Bubulcus ibis*), painted bunting (*Passerina ciris*), Woodhouse's scrub-jay (*Aphelocoma woodhouseii)*, and Bewick's wren (*Thryomanes bewickii*) (JBSA 2020). Common birds of prey species include the red-tailed hawk (*Buteo jamaicensis*), eastern screech owl (*Megascops asio*), great horned owl (*Bubo virginianus*), red-shouldered hawk (*Buteo lineatus*), Swainson's hawk (*Buteo swainsoni*), Cooper's hawk (*Accipiter cooperii*), barred owl (*Strix varia*), barn owl (*Tyto alba*), harris hawk (*Parabuteo unicinctus*), turkey vulture (*Cathartes aura*), and black vulture (*Coragyps atratus*) (JBSA 2020).

Special Status Species. The JBSA Integrated Natural Resources Monitoring Plan (JBSA 2020) and USFWS Information for Planning and Consultation (IPaC) System reports for JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas (i.e., McMullen Range, Brady MOAs, Randolph MOAs, VR140, VR143, VF156, VR1120, IR123, IR148, and IR149) (USFWS 2021a, USFWS 2021b, USFWS 2021c, USFWS 2021d, and USFWS 2021e) were reviewed to determine if any federally listed, proposed, or candidate species or their habitats could potentially occur in the vicinity of the three JBSA installations and airspace areas. There are 40 federally listed species and 4 candidate species that could be listed within the timeframe of the Proposed Action that have the potential to occur on JBSA-Randolph, JBSA-Lackland, Seguin AAF, or the airspace areas. The potential for occurrence within the JBSA installations and airspace areas is based on the USFWS IPaC reports, Integrated Natural Resources Monitoring Plan, and other available resources as cited within the text following text. None of the 44 identified species have been reported or observed on JBSA-Randolph, JBSA-Lackland, or Seguin AAF (JBSA 2020). These species have not been recorded during formalized surveys conducted by TPWD, and there is a U.S. Department of Agriculture biologist currently on-site conducting airfield surveys.

Although many of the species listed in the IPaC reports (USFWS 2021a, USFWS 2021b, USFWS 2021c, USFWS 2021d, and USFWS 2021e) have designated critical habitat, none of the designations occur within or near JBSA-Randolph, JBSA-Lackland, Seguin AAF, or the airspace areas; therefore, critical habitat is not analyzed further in this EIS.

TPWD manages state-listed threatened and endangered and sensitive species in Texas. There are 128 state sensitive species in Bexar County and 75 species in Guadalupe County (TPWD 2021). Of these species, five state sensitive or state-listed species have the potential to occur on or near JBSA-Lackland: the BGEPA-protected bald eagle (*Haliaeetus leucocephalus*), zone-tailed hawk (*Buteo albonotatus*), Texas tortoise (*Gopherus berlandieri*), Texas indigo snake

(*Drymarchon melanurus erebennus*), and timber (canebrake) rattlesnake (*Crotalus horridus*). Additionally, one state sensitive species, the Texas horned lizard (*Phrynosoma cornutum*), was documented on JBSA-Lackland in 1992 (JBSA 2020). No state sensitive species have been documented on JBSA-Randolph or Seguin AAF (JBSA 2020).

3.3.3 Environmental Consequences

The biological resources analysis discusses impacts from construction and aircraft operations on vegetation, wildlife, and protected and sensitive species from the Proposed Action and alternatives. The evaluation of impacts on biological resources considers whether the action would result in a direct injury or mortality of an individual, particularly a protected or sensitive species. Each species has unique, fundamental needs for food, shelter, water, and space and can be sustained only where their specific combination of habitat requirements is available. Removal of sustaining elements of a species' habitat impacts its ability to exist. Therefore, evaluation of impacts on biological resources also is based on whether the action would cause habitat displacement resulting in reduced feeding or reproduction, removal of critical habitat for sensitive species, and/or behavioral avoidance of available habitat as a result of noise or human disturbance. The level of impacts is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources would be considered significant if species or special habitats would be adversely affected over large areas, or disturbances would cause reductions in population size or distribution of a species of special concern.

3.3.3.1 Proposed Action

Vegetation. Some of the MILCON and FSRM projects would require the temporary or permanent removal of vegetation, which would result in short- and long-term, negligible, adverse impacts on vegetation at JBSA-Randolph. Most of the MILCON and FSRM projects would be situated within highly urban areas or on already impervious surfaces, so the amount of vegetation lost would be minimal and the overall impact on vegetation would be negligible. Furthermore, JBSA-Randolph proposes, under a different action, to remove up to 40 percent of trees in the Randolph Field National Historic Landmark District (NHLD) before the MILCON and FSRM projects are ready for implementation. Some of the MILCON and FSRM projects are in or near the area of proposed tree removal; therefore, minimal vegetation removal would be necessary when the MILCON and FSRM projects are ready for implementation. Vegetation within the footprint of new construction would be permanently lost. Vegetation surrounding new construction might be restored, as practicable, following construction as part of landscaping efforts. Very little native vegetation would be permanently lost. The proposed ball field would be sited on managed grasslands and would require the permanent removal and modification of the existing nonnative grassland. Because this area already contains nonnative species, no impacts on native vegetation would occur.

No impacts on vegetation would occur at JBSA-Lackland and Seguin AAF because no ground disturbance would occur at these JBSA installations. Likewise, no impacts on vegetation beneath the airspace areas would occur. The phased delivery of T-7A aircraft and removal of

T-38C aircraft, operations from these aircraft, and the personnel changes associated with the Proposed Action would have no impacts on vegetation.

Wildlife. Short- and long-term, negligible, adverse impacts on wildlife at JBSA-Randolph would occur from construction of the MILCON and FSRM projects. Wildlife that could occur near the project sites would temporarily avoid the sites during construction due to intermittent increases in noise from heavy equipment. As a result, direct injury to individuals would be unlikely. Many of the wildlife species on JBSA-Randolph are urban-adapted and would likely return to normal behavior once construction is finished and the proposed facilities and infrastructure are operational. The proposed ball field would be sited on managed grasslands and would require the permanent removal and modification of the existing nonnative grassland. Wildlife species such as small mammals and grassland birds may use this area for foraging and possibly nesting. Because this area would be permanently altered and experience more frequent maintenance year-round, individual wildlife may avoid the area and move to adjacent available habitat. Because the proposed ball field would not affect large populations of wildlife and many of the species are urban-adapted and would return to normal behavior shortly after construction is finished, the impacts would be negligible.

In accordance with the JBSA BASH program, protection of wildlife during construction, including clearing of vegetation, including trees, would be conducted with a focus on habitat reduction, deterrent measures, and depredation avoidance. If activities occur during the MBTA-nesting season (March 15 through September 15), a qualified biologist should conduct nest surveys to determine if there are any active nests present. Nest surveys would be conducted no more than five days prior to the scheduled clearing. If active nests are observed, a 150-foot buffer of vegetation would be left intact until the young have fledged or the nest is abandoned. Such nest surveys would be included as a mitigation and included in the required Mitigation Plan. Additionally, once construction is complete, reclamation or landscaping designs would be accomplished as a BMP in accordance with the BASH program and installation Vegetation Management Plan. Erosion control measures would be implemented post-construction to prevent degradation to remaining any wildlife nesting or foraging habitat.

Long-term, minor, adverse impacts on wildlife may occur from increased aircraft operations during the T-38C to T-7A transition period and at full T-7A implementation and with the introduction of nighttime T-7A operations at JBSA-Randolph and JBSA-Lackland. Increased aircraft operations would increase the risk of bird strikes. To minimize the potential for bird strikes, DAF would update their BASH Plan to include the higher intensity of aircraft operations at all three JBSA installations.

Long-term, direct, adverse impacts on bat species would occur from increased aircraft operations during the T-38C to T-7A transition period and at full T-7A implementation and with the introduction of nighttime T-7A operations at JBSA-Randolph. DAF data collected regarding bat strikes at JBSA-Randolph on T-38s in 1967 found that 11 percent of flights between dusk and dawn had a wildlife strike during August 1967. Based on historical data, the number of proposed nighttime aircraft operations, and the location and range of bats in the vicinity, there would likely be an increase in bat strikes from the proposed increase in nighttime operations.

Mexican free-tailed bats fly at altitudes of approximately 2.0 miles, which is the highest of all bats, and can travel up to 31 miles away from the roosting site. Mexican free-tailed bats spend approximately 60 percent of their active time foraging at heights of 20 to 49 feet. Flights taking off and landing at dusk could strike bats that are leaving the roost. Currently, under 12th Flying Training Wing Instruction 13-204, bat procedures are implemented one hour prior to sunset and 30 minutes after sunrise from April 1 to October 31 (Salinas 2013). Instruction 13-204 (12th Flying Training Wing 2019) states:

> "When Bat Procedures are in effect, Wing T-38 sorties will be flown to an overhead (if open) full stop. Wing T-1 sorties will normally recover via one instrument approach or straight-in to a full stop. Wing T-38 and T-1 takeoffs during bat procedures require 12 command approval. If the Supervisor of Flying determines that special entry procedures are required to avoid high threat areas, Air Traffic Control will advise the aircraft immediately. Air Traffic Control will advise transient T-38 and T-1 aircraft when bat procedures are in effect. Transient T-38 and T-1 aircraft arrivals will terminate to full stop landings. In addition, the following restrictions apply to all 12 Flying Training Wing aircraft from 1 June to 15 July: All aircraft will be limited to one approach to a full stop during the period starting one hour prior to one hour after official sunset. During this period, no takeoffs are allowed without command approval."

JBSA-Randolph is currently closed at night, but if nighttime operations were to begin, to minimize impacts on bats leaving and entering roosting sites at dusk and dawn, DAF would follow their BASH Plan and Instruction 13-204, as well as monitor bat activity in the area, and if possible, use alternate runways during peak bat activity hours and months (dusk times in April to early October).

The Bash Plan notes in Appendix C that the greatest bird threat while flying at low altitude comes from vultures and soaring raptors indigenous to this area. A year-round threat, these raptors presence may intensify during hunting season and migration season. Increased activity has also been observed ahead of cold fronts moving through the area. Vultures are probably the greatest concern, as they tend to soar at altitudes from the surface to 2,000 feet and loiter for long periods. Early morning and evening roosts are on transmission and communication towers. They take flight early to mid-morning from their roost in search of food (carrion, i.e., dead animals). During their "social soaring" behavior that normally occurs in the mid-afternoon, a large number (kettle) of vultures will congregate at altitudes coinciding with normal operating altitudes for aircraft. Clearing vigilance is the best recourse for threat avoidance. Pilot Reports for dense vulture activity should be investigated and carrion removed (JBSA 2018d). A local resident in the Seguin area has confirmed the presence of large birds in the vicinity of Seguin AAF through personal observations of vultures flying in the same airspace as T-38C aircraft. Appendix B of the JBSA BASH Plan delineates tasks and responsibilities for tasked organization to execute the JBSA BASH Plan. Implementation of these tasks and responsibilities continues to reduce the potential for strikes to occur around the JBSA airfields and vicinity.

The phased delivery of T-7A aircraft and removal of T-38C aircraft and the personnel changes associated with the Proposed Action would have no impacts on wildlife. No construction

impacts on wildlife would occur at JBSA-Lackland and Seguin AAF because no ground disturbance would occur at these JBSA installations.

Special Status Species. The Proposed Action would have no effect on all 44 of the federally listed species on JBSA-Randolph, JBSA-Lackland, Seguin AAF, and the airspace areas. These species occur in unique habitats that are not present at JBSA-Randolph, JBSA-Lackland, or Seguin AAF or their range does not include these installations. Additionally, aircraft operations in the airspace areas would have no effect on the terrestrial and aquatic species that occur within and near these areas because airspace operations would occur at an altitude where these species do not occur.

Groundwater withdrawal from the Edwards Aquifer would increase from the addition of 879 new persons (303 households) to the region; therefore, the Proposed Action could affect water levels within the aquifer or associated springs. The Texas Water Development Board determined that 246 gallons per day (gpd) per household was the domestic water consumption rate in 2015 in the state. With 303 new households, this equates to 74,538 additional gallons withdrawn each day, 27,206,370 additional gallons withdrawn each year, or 83.5 additional acre-feet per year. Most of this groundwater withdrawal would be consumed at residences off of JBSA and would not count toward the installation's pumping allotment. **Section 3.7.3** provides further detail regarding impacts to water supply infrastructure, and **Section 3.9.3** provides further detail regarding impacts to the groundwater aquifer.

DAF currently has a Biological Opinion that addresses groundwater withdrawal from the Edwards Aquifer to protect seven species and gives JBSA a pumping allotment of 12,012 acre-feet per year. JBSA has historically withdrawn less than half of its allotment each year. The seven protected species are the endangered Comal Springs dryopid beetle (*Stygoparmus comalensis*), Comal Springs riffle beetle (*Heterelmis comalensis*), Peck's cave amphipod (*Stygobromus pecki*), Texas blind salamander (*Typhlomolge rathbuni*), fountain darter (*Etheostoma fonticola*), and Texas wild-rice (*Zizania texana*) and the threatened San Marcos salamander (*Eurycea nana*). These species have not been documented at any of the three installations because of lack of suitable habitat and occur in areas associated with the Edwards Aquifer or near the City of San Marcos. Furthermore, the additional groundwater withdrawal associated with the Proposed Action would have *no effect* on these seven species based on the previous Section 7 Consultation 02ETAU00-2013-F-0060.

DAF has determined that the Proposed Action would have no effect on 44 federally listed species; therefore, neither formal nor informal consultation with USFWS is necessary (50 CFR § 402.14[b]). DAF has submitted a letter to the USFWS Austin Field Office regarding the no effect determination, but written concurrence is not necessary. A copy of the letter submitted to USFWS is included in **Appendix F**.

No appreciable effects on state sensitive species would result from the Proposed Action. Of the six state sensitive species, the Texas horned lizard is the only species known to occur on JBSA-Lackland. A single individual was documented on the installation in 1992 (JBSA 2020). The Texas horned lizard inhabits open, arid, and semi-arid regions with sparse vegetation including grass, cactus, scattered brush, or scrubby trees (TPWD 2020). The Proposed Action only would entail aircraft operations at JBSA-Lackland, and no construction or ground disturbance

would occur at this JBSA installation. The Texas horned lizard has not been documented since 1992; therefore, the population viability would not be affected by T-7A operations on JBSA-Lackland.

The bald eagle and zone-tailed hawk are possible transients on JBSA-Lackland. Bald eagles are found primarily near rivers and large lakes. The zone-tailed hawk inhabits arid open country, open deciduous or pine-oak woodland, mesa or mountain country, often near watercourses, and wooded canyons and tree-lined rivers (TPWD 2020). Increased aircraft operations would increase the risk of bird strikes. To minimize the potential for bird strikes, DAF would update their BASH Plan to include the higher intensity of aircraft operations at all three JBSA installations.

The Texas tortoise, Texas indigo snake, and timber (canebrake) rattlesnake are possible residents but have not been observed on JBSA-Lackland (JBSA 2020). The Texas tortoise is found in open scrub woods, arid brush, lomas, grass-cactus association and is often in areas with sandy, well-drained soils. The Texas indigo snake is found in thornbush-chaparral woodland, especially dense riparian corridors. The timber rattlesnake is found in swamps, floodplains, upland pine and deciduous woodland, riparian zones, and abandoned farmland (TPWD 2020). Suitable habitat for the Texas indigo snake and timber rattlesnake occurs on JBSA-Lackland along Leon Creek. These species would be restricted to the riparian corridor of Leon Creek and other undeveloped areas. If they did occur on JBSA-Lackland, they are unlikely to be found along the airfield or where aircraft operations would occur. Therefore, no effects on these species would occur from the increase in aircraft operations.

3.3.3.1.1 Alternative 1

Impacts on biological resources from fewer T-7A aircraft and T-7A operations that are at a lower intensity than the Proposed Action (beginning in 2027) would be slightly less than those described for the Proposed Action. Compared to the Proposed Action, aircraft operations at a lower intensity would slightly decrease the potential for BASH incidents at all three JBSA installations. Similar methods as described for the Proposed Action would be implemented to minimize the potential for bird and bat strikes. Although installation of only 52 T-7A shelters under Alternative 1 (rather than 65 shelters under the Proposed Action) would disturb less area, construction impacts on biological resources would be identical to those described for the Proposed Action because of the lack of vegetation and wildlife habitat on the JBSA-Randolph airfield. The different interior design for the GBTS facility under Alternative 1 would have identical impacts on biological resources as the interior design under the Proposed Action. The slightly smaller addition to Building 38 under Alternative 1 would have a negligible difference in impacts due to the already disturbed area immediately adjacent to the building.

3.3.3.1.2 Alternative 2

Impacts on biological resources from T-7A operations that are 15 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action. The increase in operations would slightly increase the potential for BASH incidents at all three JBSA installations as compared to the Proposed Action. Similar methods as described for Proposed Action would be implemented to minimize the potential for bird and bat strikes.

3.3.3.1.3 Alternative 3

Impacts on biological resources from T-7A operations that are 25 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action and Alternative 2. The increase in operations would slightly increase the potential for BASH incidents at all three JBSA installations as compared to the Proposed Action and Alternative 2. Similar methods as described for the Proposed Action would be implemented to minimize the potential for bird and bat strikes.

3.3.3.2 No Action Alternative

The No Action Alternative would not contribute to new or additional impacts on biological resources. No facility construction would occur, and there would be no changes in aircraft operations. No vegetation removal would occur, and no impacts on wildlife, including protected and sensitive species, would occur. Biological resources conditions at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged when compared to the existing conditions identified in **Section 3.3.2**.

3.3.4 Mitigation and Adaptive Management

As flight profiles and syllabus for the T-7A aircraft are further developed under the adaptive management strategy proposed for the air quality and noise resources, the proposed operational changes will be reviewed and analyzed to determine the potential impacts between flights and occurrences or encounters with bats flying in the same airspace or altitudes. If necessary, mitigation will be developed to reduce the potential for impacts to occur.

If activities occur during the MBTA-nesting season (March 15 through September 15), a qualified biologist should conduct nest surveys to determine if there are any active nests present. Nest surveys would be conducted no more than five days prior to the scheduled clearing. If active nests are observed, a 150-foot buffer of vegetation would be left intact until the young have fledged or the nest is abandoned.

3.4 Cultural Resources

3.4.1 Definition of the Resource

Cultural resources are historic districts, sites, buildings, structures, or objects considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Depending on the condition and historic use, such resources might provide insight into the cultural practices of previous civilizations, or they might retain cultural and religious significance to modern groups. Typically, cultural resources are subdivided into archaeological resources, architectural resources, or resources of traditional or religious significance. Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., projectile points and bottles) but standing structures do not remain. Architectural resources include standing buildings, bridges, dams, other structures, and designed landscapes of historic or aesthetic significance. Resources of traditional, religious, or cultural significance can include archaeological resources, sacred sites, structures, districts, prominent topographic features, habitat, plants, animals, or minerals considered essential for the preservation of traditional culture.

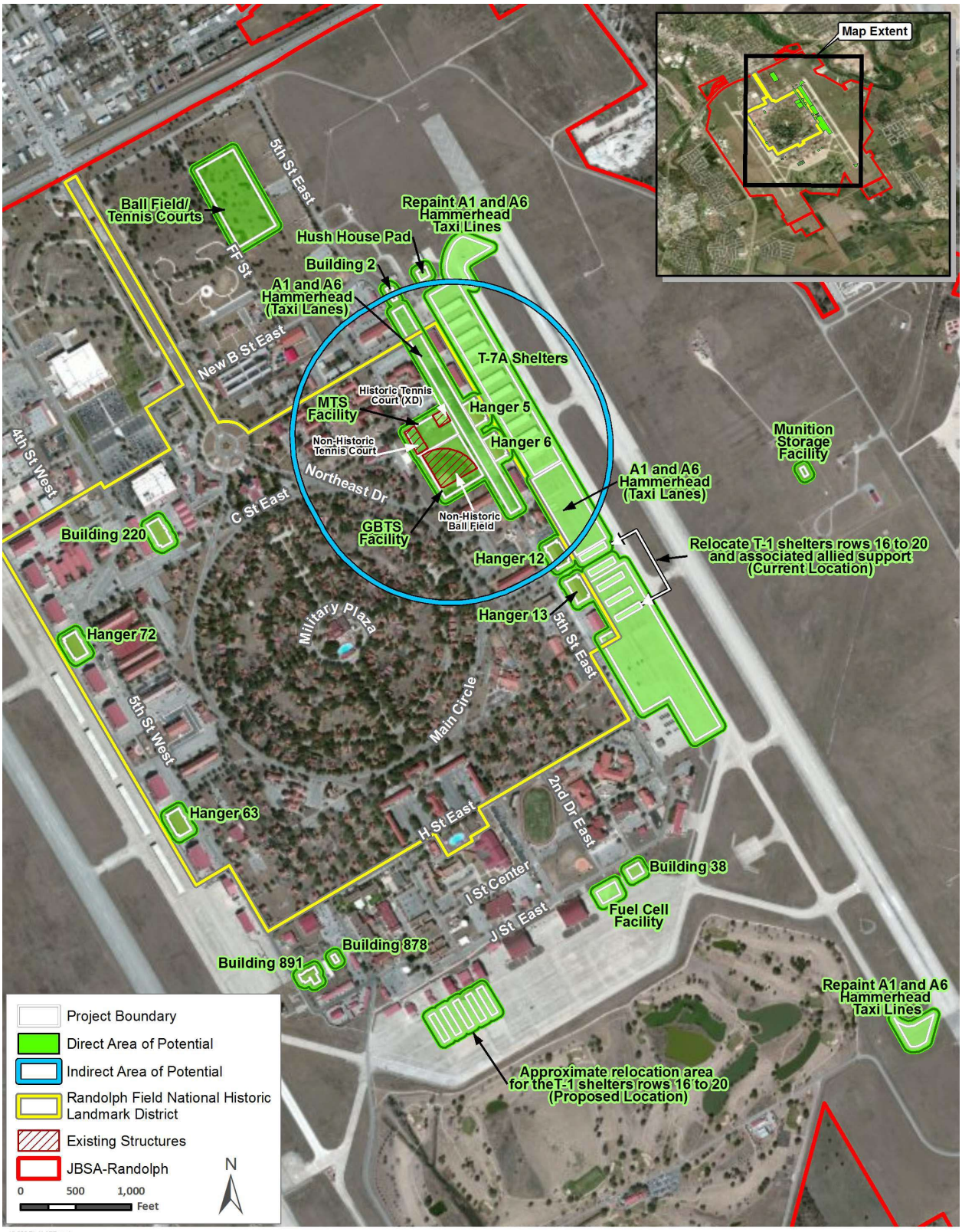
Several federal laws and regulations govern protection of cultural resources including the National Historic Preservation Act (NHPA) (1966), the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). JBSA is required to comply with DAF regulations and instructions regarding cultural resources, including Air Force Manual 32-7003, *Environmental Conservation,* and the JBSA Integrated Cultural Resources Management Plan (JBSA 2014). DAF consults with federally recognized tribes in accordance with the laws listed previously and EO 13175, *Consultation and Coordination with Indian Tribal Governments*; DoD Instruction 4710.02, *Interactions with Federally Recognized Tribes*; and Air Force Instruction (AFI) 90-2002, *Air Force Interactions with Federally Recognized Tribes*.

The NHPA authorized the Secretary of the Interior to expand and maintain the criteria for assessing the significance of cultural resources. Resources that are listed or eligible for listing in the National Register of Historic Places (NRHP) are termed "historic properties." Generally, cultural resources must be more than 50 years old to warrant consideration for the NRHP. More recent resources might warrant listing if they are of exceptional importance or if they have the potential to gain significance in the future. The NHPA also directs federal agencies to seek ways to avoid, minimize, or mitigate impacts to historic properties through Section 106 consultation. Federal agencies assess the potential impact of their undertakings on historic properties in the area of potential effect (APE). Agencies then consult under Section 106 of the NHPA with the appropriate SHPO and federally recognized tribes.

As part of the Section 106 process, DAF has defined this undertaking as the Proposed Action and alternatives and has defined the APE as the potential impact area from all activities. The APE includes areas of potential direct and indirect effects. Direct effects include those from ground disturbance, vibration, building modification, and staging and equipment storage. Indirect effects include those from noise and aesthetic interference. For this undertaking, the direct APE is defined as all buildings proposed for interior and exterior alteration, including a 50-foot buffer around those buildings to account for construction staging; all areas of new construction; all landscape features such as the existing ball field, tennis court, and taxi lanes proposed for alteration; and the location of the proposed ball field. The indirect APE is an area 0.25 miles in radius centered around the GBTS facility where four 15-foot-tall antennae would be located on top of the building. The indirect APE includes the full distance (0.25 miles) that the 15-foot-tall antennae are anticipated to be present within the setting of adjacent facilities, though actual viewing distance is anticipated to be much shorter in some locations depending on the presence of adjacent buildings, structures, utility components, and foliage. The direct and indirect APE total approximately 56 acres and are shown on **Figure 3-26**.

No changes to personnel numbers, buildings, structures, objects, or sites would occur at JBSA-Lackland and Seguin AAF. The only aspects of the Proposed Action and alternatives that would occur at these two JBSA installations would be a change in the type of aircraft flown and the timing (e.g., daytime or nighttime) and frequency of flight operations. These aspects have no potential to impact historic properties. As such, the APE for this undertaking does not include any portions of JBSA-Lackland and Seguin AAF. The APE for this undertaking also does not include areas within the airspace where the T-7A would perform operations because

T-7A flight training would occur at a relatively high altitude in previously defined military airspace and would have no potential to impact historic properties.



Data Source: Imagery (ESRI 2015).

Figure 3-26. Cultural Resources Area of Potential Effect

3.4.2 Affected Environment

Regional History. The prehistory of Central Texas, which includes the JBSA area, can be subdivided into three broad temporal periods: the Paleo-Indian, Archaic, and Late Prehistoric. JBSA is located within the Central Texas archaeological region. Cultural periods associated with this area include Paleo-Indian, Archaic, Late Prehistoric, Protohistoric, and Historic.

The Paleo-Indian period is the earliest substantiated cultural period in Texas. The evidence of Paleo-Indian activity across Central Texas through sites and isolated artifacts is fairly common. The period is often characterized by small but highly mobile bands of foragers that were specialized hunters of Pleistocene megafauna. The Early Paleo-Indian period consists of two projectile point styles: Clovis and Folsom. Toward the end of the Late Paleo-Indian period a great variety of projectile point styles began to appear. The subsequent Archaic period (8,800-1,200 before present) is broadly characterized by stemmed and side-notched dart points and by the appearance of ground and pecked stone tools. Following the Archaic, the Late Prehistoric period is characterized first by the introduction of the bow-and-arrow and later by ceramics, probably from the north by persons or mechanisms unknown. Although the subsistence economy was still heavily dependent on gathering a variety of plant foods, hunting seems to have increased in importance, as indicated by an increased ratio of projectile points to other tools and by an increased frequency of deer bones in midden deposits (JBSA 2014).

Spanish exploration and missionization of Texas began in 1519 with the arrival of Alonso Alvarez de Piñeda, but it was 200 years before the Spanish established a permanent settlement (located along the San Antonio River). Between 1718 and 1731, a town (Villa de Bexar) and five missions were established on the river within a 12-mile radius of the present-day city of San Antonio. By the early 1800s, Spanish control over its provinces in North America had deteriorated culminating in Mexico's independence in 1821. Initially, American colonists were encouraged to settle in the Texas region, but the Mexican government soon became alarmed at the overwhelming numbers of Anglo-American settlers. In 1830, Mexico prohibited further colonization while the settlers advocated for independence. San Antonio settlers played an important role in the Texas Revolution, considered as an uprising, which centered on independence. On December 29, 1845, however, the United States Congress voted to annex the Republic of Texas. In 1861, Texas voted overwhelmingly to join the South in seceding from the Union and the war for Texas was won in 1865. One of the most important events to impact the region's economy and demography was the arrival of the railroad in 1877. As the crossroads for five railroads, San Antonio sat poised for further economic growth at the turn of the twentieth century. The San Antonio area was a source of building materials with deposits of stone, clay, sand, and gravel. Other important industries included agriculture and stock-raising (JBSA 2014).

The twentieth century was also the start of a strong relationship between San Antonio and the U.S. military. San Antonio's association with U.S. military installations had begun in earnest in the 1870s when a permanent Quartermaster Depot was established on a site north of the city, but the impetus behind twentieth century military growth in San Antonio was due to advances in aviation and the military's interest in air power. With its flat terrain and temperate climate, San Antonio was an ideal location for aviation training. Thus, in 1909, Fort Sam Houston was selected for the Army's permanent flight training center. The two world wars prompted the

growth and development of San Antonio's extensive military history with the establishment of Camp Travis, Randolph Field, Kelly Fields 1 and 2, Brooks Field, Camp Stanley, Camp Bullis, and the San Antonio Aviation Cadet Center (the predecessor to JBSA-Lackland). Throughout the remainder of the twentieth century, San Antonio continued to grow and diversify as Fort Sam Houston, Randolph AFB, Lackland AFB, and Camp Bullis contributed to the nation's Cold War efforts, primarily through training missions in flying and in combat medicine. Lackland AFB was the starting point for nearly all DAF personnel as they received their basic training there (JBSA 2014). Additional background and history on JBSA, JBSA-Randolph, JBSA-Lackland, and Seguin AAF is provided in **Section 1.4.1**.

Cultural Resources of the APE. DAF has conducted several cultural resources investigations within the APE. In 1991, the National Park Service Interagency Archeological Services, Denver, Colorado, surveyed areas of JBSA-Randolph considered to have a high potential for intact sites. No archaeological resources were identified by the study, and no further work was recommended. No archaeological sites have been identified at JBSA-Randolph (JBSA 2014).

Architectural surveys have resulted in the identification of several historic properties, including the Randolph Field NHLD, which was listed in the NRHP in 1996 and designated a National Historic Landmark in 2001. Randolph Field was constructed as an air facility and planned with the concept as an "Air City." Its innovative design included two flight lines with aircraft hangars, central housing, administrative buildings, and a service area. The buildings and structures are classified as Spanish Colonial Revival in style and the hangars are Art Deco in style. Randolph Field played a pivotal role in the development of flight training in the mid-1920s and 1930s and became the headquarters for multiple military organizations in the 1930s. Flight training schools were eventually established in Alabama and California, but Randolph Field is recognized as a model airfield for flight training (NPS 2001).

The district is composed of 350 contributing resources and 47 non-contributing resources (NPS 2001). Other historic properties at JBSA-Randolph include two individually eligible properties dating to the Cold War era (Buildings 40 and 41), which were determined eligible for the NRHP in 2002 during a Cold War-Era buildings and structures inventory and assessment (JBSA 2014). Of the historic properties at JBSA-Randolph, 10 are located within the APE including Randolph Field NHLD and nine contributing resources located within the district. The Randolph Field NHLD is shown on **Figure 3-26**.

Twelve federally recognized tribes have an expressed or potential interest in cultural resources at JBSA and the airspace areas. These tribes are the Absentee-Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Apache Tribe of Oklahoma, Caddo Nation of Oklahoma, Comanche Nation, Coushatta Tribe of Louisiana, Delaware Nation, the Mescalero Apache Tribe of the Mescalero Reservation, Osage Nation, the Tonkawa Tribe of Indians of Oklahoma, and the Wichita and Affiliated Tribes. DAF consults with these tribes on issues related to cultural resource management, the unanticipated discovery of human remains and cultural items under the Native American Graves Protection and Repatriation Act, and on project-specific effects under Section 106 of the NHPA. To date, these tribes have not identified any sacred sites or traditional cultural properties relevant to DAF. DAF has invited these tribes to consult on the Proposed Action and alternatives.

3.4.3 Environmental Consequences

Impacts on cultural resources result from actions that change culturally valued elements of a resource or restrict access to cultural resources. Impacts on cultural resources may be short- or long-term and direct or indirect. Direct impacts can result from physically altering, damaging, or destroying all or part of a resource. Indirect impacts can occur from alterations to characteristics of the surrounding environment that contribute to the importance of the resource; introducing visual, atmospheric, or audible elements that are out of character with the property or that alter its setting or feeling. Under Section 106 of the NHPA, DAF must determine if the Proposed Action and alternatives would result in an "adverse effect" on historic properties and must avoid, minimize, or mitigate such effects if they would occur. For the purposes of Section 106, an adverse effect is one that changes elements or characteristics of a historic property that make the property eligible for listing in the NRHP. This analysis focuses on cultural resources that are listed in or eligible for listing in the NRHP and incorporates DAF findings of effect under Section 106 of the NHPA.

Interior modifications to non-public portions of historic buildings and work outside the Randolph Field NHLD that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity and does not require SHPO review.

3.4.3.1 Proposed Action

As noted in **Section 3.4.1**, a change in the type of aircraft flown or the timing (e.g., daytime or nighttime) and frequency of flight operations would have no potential to impact historic properties. T-7A flight training would occur at a relatively high altitude in previously defined military airspace. Therefore, flight training would have no potential to impact historic properties. A change to personnel numbers at JBSA-Randolph also would have no potential to impact historic properties. The only aspects of the Proposed Action with potential to impact historic properties are the 19 MILCON and FSRM projects proposed for JBSA-Randolph. **Table 3-63** lists the MILCON and FSRM projects and summarizes their impact on historic properties.

Nine of the 19 MILCON and FSRM projects would have no potential to impact cultural resources as they occur outside of the Randolph Field NHLD and include buildings, structures, or sites that have been previously determined not eligible for NRHP listing or were constructed after 1990 and have not reached the threshold for NRHP evaluation. Further, some of these projects would not involve any ground disturbance, building modifications or construction, or other activities with potential to affect cultural resources and were not included in the APE.

The remaining 10 MILCON and FSRM projects have the potential to impact cultural resources because they are located within the Randolph Field NHLD and the district is a historic property. Of those ten projects, six would occur within the interior of buildings located in the Randolph Field NHLD (with no impact to character-defining interior features) and would have no effect on contributing resources within the district or the NHLD itself. The remaining four projects would include exterior alteration to one NHLD-contributing hangar, repainting of the non-contributing taxi lanes, and the construction of the GBTS and MTS facilities within recreation areas that do not contribute to the NHLD.

Table 3-63. Cultural Resources Components of the Proposed Action and Impact on Historic Properties

Building Name/ Number	Project Component	NRHP Status	Date constructed	Assessment of Effect
MILCON Projects				
Facility 388 (Non-Historic Tennis Court); Facility 389 (Non-Historic outbuilding); 390 (Historic Tennis Court, Demolished)	Construct a 30,000 ft^2 high-bay aircraft MTS facility at the current location of Facilities 388, 389, 390, and 397. New construction would occur within the Randolph Field NHLD and on existing ball field and tennis court properties. All existing facilities are non-historic and ineligible, except for Facility 390, which was replaced with a skate park ca. 2004 and is no longer extant. All new construction would occur within an existing recreation area. A new ball field and tennis courts would be constructed on vacant land as a replacement and would not be located within the Randolph Field NHLD.	Facility 388 – Not historic (non-contributing to the Randolph Field NHLD) Facility 389 – Not historic (non-contributing to the Randolph Field NHLD) Facility 390 – Listed, contributing to Randolph Field NHLD; however, demolished ca. 2004 and now a skateboarding park.[9]	ca. 1980 ca. 1980 ca. 1950 (demolished ca. 2004)	No adverse effect
Facility 397 (Non-Historic Ball Field)	Construct a 33,000 ft^2 facility to hold a GBTS facility. Construct a 10,125 ft^2 parking lot to support the MTS and GBTS facilities. Four antennae would be located on top of the GBTS facility and would extend up to a maximum height of 15 feet above the building. New construction on existing ball field and tennis court property within the Randolph Field NHLD. Existing facility is non-historic and ineligible. All new construction would occur within existing recreation area. The antennae may be visible for up to approximately 0.25 miles; however, trees and buildings in the immediate vicinity would obscure that view, especially towards the center of the installation to the southwest.	Facility 397 – Not eligible (non-contributing to the Randolph Field NHLD)	ca. 1970	No adverse effect

[9] Historic aerial photographs show this facility was demolished ca. 2004 (NETR 2019).

Building Name/ Number	Project Component	NRHP Status	Date constructed	Assessment of Effect
Hush House Pad (Non-Historic)	The proposed hush house pad would be constructed on the site of the existing hush house pad and would be a 24,611 ft^2 concrete pad. The hush house pad is not located within the Randolph Field NHLD. The existing hush house pad has not been previously recorded and is a concrete pad constructed ca. 1990. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	Not historic (not located within the Randolph Field NHLD)	ca. 1990	No effect
Fuel Cell Facility	Construct 35,138 ft^2 fuel cell facility and parking area west of Building 38 on currently vacant land not located within the Randolph Field NHLD. As the facility has not yet been constructed, and would be located on currently vacant land, it does not have a facility number. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	N/A (not yet constructed)	N/A – Vacant	No effect
T-7A Shelters	Construct 65 shelters for T-7A aircraft to replace existing, non-historic shelters. Structures are not located within the Randolph Field NHLD. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	Not historic (not located within the Randolph Field NHLD)	ca. 2004	No effect
Building 38	Building 38 would be modified by adding two more rooms (5,000 ft^2) to the southwest side. Building 38 is not located within the Randolph Field NHLD. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	Not historic (not located within the Randolph Field NHLD)	ca. 1990	No effect

Building Name/ Number	Project Component	NRHP Status	Date constructed	Assessment of Effect
FSRM Projects				
Hangar 63	Interior of first floor to be modified. No alteration to exterior of building and no character-defining features impacted. Building is located within the Randolph Field NHLD. Interior modifications to non-public portions of historic buildings are covered by the JBSA Programmatic Agreement as an exempt activity.	Listed, contributing to the NHLD	1931	No effect
T-1 shelters rows 16 to 20	Relocate five existing rows of T-1 shelters (rows 16 to 20) from the East Ramp to South Ramp. The T-1 shelters are currently not within the Randolph Field NHLD and would remain out of the district upon being moved. No character-defining features of the NHLD have the potential to be impacted. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	Not historic (existing shelters) (not located within the Randolph Field NHLD)	ca. 2004	No effect
Hangar 13	Interior of hangar to be modified for training and communication equipment. No character-defining features impacted. Building is located within the Randolph Field NHLD. Interior modifications to non-public portions of historic buildings are covered by the JBSA Programmatic Agreement as an exempt activity.	Listed, contributing to the NHLD	1931	No effect
Building 220	Public Affairs would move from Hangar 6 to Building 220. Interior modifications to use as office space; installation of utilities including electrical service and computer and phone lines. No character-defining features impacted. Building is located within the Randolph Field NHLD. Interior modifications to non-public portions of historic buildings are covered by the JBSA Programmatic Agreement as an exempt activity.	Listed, contributing to the NHLD	1930	No effect

Building Name/ Number	Project Component	NRHP Status	Date constructed	Assessment of Effect
Hangar 72	Exterior modifications include the removal of a blocked door and install two lockable full-length glass doors. Security Forces fencing and concertina razor wire would be removed. Interior modification includes the demolition of the Flight Service Center office complex and gun vault. Building is located within the Randolph Field NHLD.	Listed, contributing to the NHLD	1931	No adverse effect
Hangar 6	Interior modifications would occur to modernize equipment and reconfigure interior office and training spaces. The project would also include adding telecommunications lines that would not impact the building exterior. No alteration to exterior of building would occur. No character-defining features would be impacted. Building located within NHLD boundary.	Listed, contributing to the NHLD	1931	No adverse effect
A1 and A6 Hammerhead Taxi Lanes	Repaint A1 and A6 hammerhead taxi-lane markings and restripe for T-7A aircraft. Taxi lanes are not significant setting features and have been modernized and re-striped on many occasions over time. A portion of the existing taxi lanes proposed for marking and restriping are located within the Randolph Field NHLD; however, no character-defining features of the NHLD have the potential to be impacted.	Not eligible (non-contributing to the Randolph Field NHLD)	ca. 1930	No adverse effect
Building 2, Buildings 878, and Building 891	Move CE Plumbers and HVAC personnel and equipment from Building 2 to Buildings 878 and 891. Buildings 2, 878, and 891 are not located within the Randolph Field NHLD. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	Building 2 – Not historic (not located within the Randolph Field NHLD) Building 878 – Not historic (not located within the Randolph Field NHLD) Building 891 – Not eligible (not located within the Randolph Field NHLD)	ca. 1990 ca. 1975 ca. 1960	No effect

Building Name/ Number	Project Component	NRHP Status	Date constructed	Assessment of Effect
Hangar 12	Interior alteration to hangar for 560 FTS expansion to install new operational equipment. No character-defining features impacted. No exterior alteration. Building is located within the Randolph Field NHLD. Interior modifications to non-public portions of historic buildings are covered by the JBSA Programmatic Agreement as an exempt activity.	Listed, contributing to the NHLD	1931	No effect
Building 2	Alteration to relocate J85 engine shop. Building 2 is not located within the Randolph Field NHLD. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	Not historic (not located within the Randolph Field NHLD)	ca. 1990	No effect
Hangar 5	Reconfigure interior of hangar for use as a repair facility. Remove interior engine shop mechanical equipment. No character-defining features impacted. No exterior alteration. Building is located within the Randolph Field NHLD. Interior modifications to non-public portions of historic buildings are covered by the JBSA Programmatic Agreement as an exempt activity.	Listed, contributing to the NHLD	1931	No effect
Ammunition Storage Area	A new 1,855 ft^2 munitions storage building would be added to the JBSA-Randolph ammunition storage area. The proposed facility would not be located within the Randolph Field NHLD. New building on vacant land. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	N/A; JBSA-Randolph ammunition storage area is not historic	ca. 2004	No effect

Building Name/ Number	Project Component	NRHP Status	Date constructed	Assessment of Effect
Trim Pad/Compass Rose	Utilize the existing Trim Pad to install an anchor and relocate the Compass Rose. Located on the airfield and not within the Randolph Field NHLD. Work outside the district that is not adjacent to historic properties is covered by the JBSA Programmatic Agreement as an exempt activity.	N/A; trim pad is part of the parking ramp and compass rose is aeronautical equipment	Unknown	No effect

Key: ca. = circa (approximately).

An adverse effect is one that changes elements or characteristics of a historic property that make the property eligible for listing in the NRHP. Exterior alterations to Hangars 72 would occur on secondary elevations and are anticipated to not adversely impact any character-defining features. Hangar 72 modifications would include the alteration of two exterior doors; however, alteration would occur within existing door frames. Exterior fencing would also be removed; however, it is not a character defining feature of the hangar. The renovation plans for Hangar 72 are being developed and have not been fully designed. Work occurring to Hangar 72 is expected to be covered under the *Programmatic Agreement (PA) Among the U.S. Air Force and the Texas State Historic Preservation Officer for the Operation, Maintenance and Development of Joint Base San Antonio, Texas* (signed January 2021).

The taxi lanes, although partially located within the APE, do not contribute to the Randolph Field NHLD, and their repainting would have no adverse effect on the NHLD.

The last two components include the MTS and GBTS facilities. Both facilities would require the removal of non-contributing and non-historic recreational facilities within the NHLD. Thus, neither component would directly impact any contributing resources within the NHLD. Although there would be no physical impact to any contributing buildings, structures, or contributing open areas, the MTS and GBTS facilities would be present within the setting of the NHLD and would be visible from NHLD-contributing facilities. Features located within the setting of the NHLD have been identified as contributing resources, specifically the airfield plan, which includes the (overall) original plan for the flying field, the road layout of almost 32 miles, the park-like areas and boulevards, and the placement of pivotal buildings. Although the MTS and GBTS facilities would be visible within the setting of the NHLD, neither facility would require alteration to the overall facility plan; the non-historic recreation features to be removed were not part of original plan; the roadway layout would not change; the tree-lined boulevards or historic landscaped open spaces would not change; and the placement of pivotal buildings would remain. Thus, although the MTS and GBTS facilities would be visible within the setting of the NHLD, the overall effect to the setting is recommended as non-adverse, as there would be no change to elements or characteristics of the historic property (i.e., the Randolph Field NHLD) that make it eligible for listing in the NRHP (i.e., contributing buildings or structures, the roadway network, contributing open spaces, or the tree-line streets).

Lastly, the proposed GBTS facility would include four 15-foot-tall antennae located on top of the building. The GBTS facility would be located within the Randolph Field NHLD, and the antennae would be potentially visible from up to 0.25 miles (i.e., throughout the indirect APE). There are currently lamp posts and other antennae and vertical incursions within the immediate landscape of the proposed antennae location. The antennae would be placed on top of the newly constructed GBTS facility, arranged along the ridge, and would be uniform in height and evenly spaced (see **Figure 2-4**). The antennae would be minimally visible within a small portion of the Randolph Field NHLD and would not diminish the District's integrity of setting.

The MILCON and FSRM projects would be mostly located on previously disturbed land and unidentified archaeological or traditional resources are not expected. Should unidentified historic properties or human remains be encountered during construction, DAF would follow the

procedures for inadvertent discoveries provided in the installation's Integrated Cultural Resources Management Plan.

DAF has applied the Criteria of Adverse Effect and has determined the Proposed Action would have no adverse effect on historic properties. DAF consulted with the Texas SHPO and has received their concurrence with this determination. On December 17, 2021, the Texas SHPO concurred with DAF's determination that the Proposed Action would have no adverse effect on historic properties. DAF submitted a letter to the National Park Service with the same determination and has received no response.

DAF has consulted with the 12 Native American tribes with interest in JBSA and the airspace areas. These tribes are the Absentee-Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Apache Tribe of Oklahoma, Caddo Nation of Oklahoma, Comanche Nation, Coushatta Tribe of Louisiana, Delaware Nation, the Mescalero Apache Tribe of the Mescalero Reservation, Osage Nation, the Tonkawa Tribe of Indians of Oklahoma, and the Wichita and Affiliated Tribes. Government-to-government consultation was initiated by JBSA-Randolph on June 22, 2021 with letters to the 12 tribes requesting assistance in identifying any historic properties of religious and cultural significance to Tribal Nations within the APE. Notification letters announcing the release of the Draft EIS were also provided to Tribes at the onset of the public comment period in October 2021. DAF has received a response from the Absentee-Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Comanche Nation, Coushatta Tribe of Louisiana, Delaware Nation, and Osage Nation. No Traditional Cultural Properties within the APE were identified by any federally recognized Tribes invited to consult on this project. No comments on the Draft EIS were received from Tribes. The remaining five Tribes did not respond to the consultation requests and additional phone call and e-mail communication efforts. Section 106 consultation is considered complete for all Tribes. All tribal consultation correspondence is included in **Appendix F**.

3.4.3.1.1 Alternative 1

Impacts on cultural resources from fewer T-7A aircraft and T-7A operations that are at a lower intensity than the Proposed Action (beginning in 2027) would be identical to those described for the Proposed Action. Like the Proposed Action, a change in the number of aircraft and flight operations at any JBSA site or established airspace areas would have no potential to impact historic properties. Identical impacts on historic properties would occur from installation of only 52 T-7A shelters (rather than 65 shelters under the Proposed Action) and a different interior design for the GBTS facility. Thus, like the Proposed Action, no adverse effect would occur as a result of Alternative 1.

3.4.3.1.2 Alternative 2

Impacts on cultural resources from T-7A operations that are 15 percent greater than the Proposed Action would be identical to those described for the Proposed Action. A 15 percent increase in flight operations at any JBSA site would have no potential to impact historic properties. Thus, like the Proposed Action, no adverse effect would occur from Alternative 2.

3.4.3.1.3 Alternative 3

Impacts on cultural resources from T-7A operations that are 25 percent greater than the Proposed Action would be identical to those described for the Proposed Action. A 25 percent increase in flight operations at any JBSA site would have no potential to impact historic properties. Thus, like the Proposed Action, no adverse effect would occur from Alternative 3.

3.4.3.2 No Action Alternative

The No Action Alternative would not impact historic properties. No facility construction would occur, and there would be no changes in aircraft operations. Cultural resources at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged when compared to the existing conditions described in **Section 3.4.2**.

3.5 Land Use

3.5.1 Definition of the Resource

Land use refers to the human use or modification of lands for various purposes and the management of those uses. Land use classifications refer to real property descriptions that indicate either natural conditions or the types of human activity occurring on a land parcel.

Primary objectives of land use management and planning are to ensure orderly and appropriate growth and compatibility between uses among adjacent property parcels or areas. Various administrative tools (i.e., policy plans, zoning ordinances, easements, subdivision regulations, deed restrictions, and covenants) are typically used to manage the development of land and facilitate desired use patterns, including protection of specially designated or environmentally sensitive uses.

Land use classifications denote predominant uses and/or characteristics of real property to provide a basis for spatial analysis and comparisons. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. Descriptive classifications for human development and activity include residential, commercial, industrial, military, agricultural, institutional, transportation, communications and utilities, and recreational.

The regulatory setting for land use includes federal, state, and local statutes, regulations, plans, policies, and programs applicable to land use management on installations and adjacent areas. Primary Air Force directives and guidance applicable to the Proposed Action include the following:

Federal Interagency Committee on Urban Noise. In June 1980, an ad hoc Federal Interagency Committee on Urban Noise published guidelines (FICUN 1980) relating DNL to compatible land uses. This committee was composed of representatives from DoD, Transportation, and Housing and Urban Development; USEPA; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, DoD and FAA adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). Although these guidelines are

not mandatory, they provide the best means for determining noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor DNL values above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dBA and higher provides the best means for assessing the noise impacts of alternative aircraft actions. In some cases, a change in noise level, rather than an absolute threshold, may be a more appropriate measure of impact.

AFI 32-1015, Integrated Installation Planning and AFH 32-7084 AICUZ Program Manager's Guide. AFI 32-1015 establishes the AICUZ discretionary program to promote compatible land use surrounding military airfields. The goal of these studies is to protect the health, safety, and welfare of people living near an airfield, while preserving the operational integrity of the defense flying mission. Components of the AICUZ program, as defined in AFH 32-7084, include CZs, APZs, hazards to air navigation (building height and obstruction criteria), and noise zones. Installations use the AICUZ program to provide land use compatibility guidelines to areas exposed to increased safety risks and noise near airfields. Aircraft noise zones, APZs, and height restrictions for nearby structures are usually identified in installation specific AICUZ studies. These studies provide information on off-installation land uses and identify uses that are compatible, incompatible, or conditionally compatible (may require noise attenuation measures) with installation noise and accident zones. In accordance with AFI 32-1015, land use can be deemed incompatible with an installation if it adversely affects the utility of training and readiness missions of a military installation, thereby affecting the ability of an installation to fulfill its mission.

AFI 32-1015 also establishes the Comprehensive Planning Program, designed to establish a framework for land use decision making in regard to development of DAF installations. The program incorporates operational, environmental, urban planning, and related considerations to identify and assess development alternatives and ensure compliance with applicable laws, regulations, and policies. Under AFI 32-1015, all major installations are required to develop an Installation Development Plan (IDP) to guide land use management and decisions.

3.5.2 Affected Environment

Installation Land Use. JBSA completed a comprehensive IDP in 2018 aligning the planning vision of JBSA with the priorities of higher-level command elements to achieve both short- and long-term sustainability of the installation (JBSA 2018a).

The proposed action directly involves the following planning districts of the IDP:

- JBSA-Randolph Support Services Planning District – encompasses the mission and community support area in the center of JBSA-Randolph.
- JBSA-Randolph Flight Operations Planning District – includes the airfield pavements and buffer zones, as well as airfield operations functions near the flightline and the golf course at the southeastern end of the installation.
- JBSA-Lackland Airfield Operations Planning District – encompasses the Kelly Field Annex airfield and related infrastructure at JBSA-Lackland.

Note: Seguin AAF is not considered a major component of JBSA and, therefore, is not designated or included directly within a planning district. As a small support airfield comprising a single runway with limited support infrastructure, Seguin AAF is not identified or anticipated to experience substantive development or changes in existing land use or military operations.

***JBSA-Randolph*.** The JBSA-Randolph Support Services Planning District generally includes lands located between the runways, comprising primarily administrative, aircraft operations and maintenance, community commercial, housing accompanied, open space/buffer zones, and outdoor recreation land uses. Land use within the JBSA-Randolph Flight Operations Planning District is devoted strictly to active aircraft operations encompassing the runways, airfield pavements, and airfield clearance zones.

Future land use objectives for the Support Services Planning District and Flight Operations Planning District primarily involve relocation of sixteen incompatible properties within the CZ. Implementation of those land use changes will require redevelopment of parcels and vacant areas and redistribution of compatible land uses within the Support Services Planning District.

JBSA-Lackland. JBSA-Lackland Airfield Operations Planning District land use is predominately devoted to airfield pavements and surrounding open space/buffer zones, with supporting aircraft operations and maintenance facilities to the west of the airfield pavements.

Minimal changes to existing land use are planned for the Airfield Operations Planning District due to current space restrictions and natural (floodplain) constraints. Substantive land use changes for this district would be dependent upon acquisition of additional lands to the north of the Air National Guard Campus located west of the airfield.

Land Use and Airspace:

Regional Compatible Use Plan. A JBSA Regional Compatible Use Plan (RCUP) was completed in March 2021 involving all JBSA installations, county governments, and a diverse group of community stakeholder organizations (AARCOG 2021). The RCUP resulted from a community-driven cooperative and strategic planning process designed to increase public awareness of military missions in the greater San Antonio area and promote compatible land use management and regional economic opportunity, while preserving military readiness and defense capabilities (AARCOG 2021). The plan advanced results of separate Joint Land Use Studies for JBSA-Lackland and JBSA-Randolph (among others) to integrate recommendations across a common and more efficient comprehensive regional framework. A key tool developed through the plan is a regional military compatibility assessment mapping tool to assist in quickly evaluating a proposed development in terms of over 25 key criteria.

Key issues and recommended strategies identified through the RCUP include the following:

- Need for greater coordination among organizations and standardized development review process
- Complete detailed economic impact assessment to provide data on direct and induced regional benefits derived from military installations

- Increased emphasis on participation in Sentinel Landscapes Partnership program to address wildlife habitat concerns
- Focus on installation housing needs with local governments and school districts.
- Address use of unmanned aircraft systems (i.e., drones) in military airspace through education and push for protective legislation
- Create retrofit lighting incentive program and local lighting ordinances to light pollution and glare concerns for aircraft operations
- Strengthen land use controls and coordination with FAA concerning vertical obstructions
- Promote infill development and use of green infrastructure to reduce greenfield development and expansion of impervious surfaces.

JBSA-Randolph JLUS. The counties of Bexar and Guadalupe and regional cities, in cooperation with DAF, completed a JBSA-Randolph JLUS in 2015 ensure future compatibility between increasing development proximate to the installation and the continuation of the military mission (County of Bexar 2015). Results of the JLUS identified the following recommendations related to land use encroachment and airspace noise to be addressed by the study partners:

- Amend unified development codes and zoning ordinances to establish heigh limits and siting criteria for alternative energy development
- Educate utilities and encourage adoption of non-reflective solar panel criteria
- Amend municipal codes and update comprehensive plans to establish a Military Influence Area Overlay District which would include Noise Military Influence Area Subzones around both JBSA-Randolph and Seguin AAF. This subzone would include all land located off installation within the 65 dBA DNL noise contours for the installations, and residential development and other noise sensitive land uses within the zone may be subject to sound attenuation measures to reduce noise impacts.
- Develop an MOU with school districts surrounding JBSA-Randolph and Seguin AAF to coordinate on all future school master plans to prevent schools from being planned in noise sensitive and safety areas of the Noise and Safety Subzones.
- Adopt Statewide Building Code Requirements Incorporating Sound Attenuation Measures Jurisdictions should adopt building code requirements for new construction within the Noise Military Influence Area Subzone that requires attenuation measures to meet the guidelines.
- Prepare educational materials on sound attenuation methods using modified DoD or FAA sound attenuation educational materials as a supplemental educational document that describes building techniques which can be used to achieve 45 dBA DNL indoors.
- Amend municipal codes, building codes, and zoning ordinances to incorporate land use guidelines and sound attenuation measures to achieve 45 dBA DNL for interior noise for all new construction and for renovations where more than 50 percent of the structure is renovated within the 65 dBA DNL noise contour.

- The cities should design, develop, and place signage in community-wide rights-of-way to notify citizens that the community is shared with JBSA-Randolph and subject to potential impacts of overflight noise.
- Develop a sound attenuation program for willing property/homeowners supporting the Statewide Energy Code.
- Assess the viability of the dedication of avigation/noise easements for new development projects requiring discretionary development approvals. Avigation easements confer the right to aircraft overflight and to generate impacts associated with normal aircraft operation such as noise, vibration, odor, air currents, illumination, and fuel consumption.
- Require avigation / noise easements and a note on the plat of the avigation easement for new development projects requiring discretionary development approvals.

JBSA-Lackland JLUS. In 2011 DAF, Bexar County, Port San Antonio, and the City of San Antonio, along with other regional entities, completed the JBSA-Lackland JLUS (County of Bexar 2011). Growth in and around JBSA-Lackland associated with mission and organizational decisions and the continued urban growth in San Antonio was recognized as potentially affecting sustainable economic activity and military missions. Compatibility recommendations of the JBSA-Lackland JLUS included the following:

- Continue strategic transfer of ownership of land that is not subject to training impacts in exchange for land of comparable market value that is sensitive to operational impacts.
- Establish a Military Sound Attenuation Overlay Zoning District near the Lackland Training Annex.
- Reduce the light pollution interference with aviation-related training activities by requiring the installation of fully shielded, cut-off outdoor lighting applications in proximity to the airfield. Prepare rationale requesting establishment of a Military Lighting Overlay District near the Kelly Field Annex and Lackland Training Annex.
- Develop future land use scenarios that minimize growth in military impact sensitive areas.
- Incorporate avigation easements into regular subdivision and plan approval processes. In exchange, homeowners may receive structural treatment to reduce indoor noise.
- Establish construction standards to reduce indoor noise exposure and rezone land in AICUZ noise contours to apply Military Sound Attenuation Overlay Zoning District.
- DAF should pursue conservation partnering opportunities through the Readiness and Environmental Protection Integration (REPI).

JBSA-Randolph AICUZ. The 2017 AICUZ study for JBSA-Randolph and Segun AAF (DAF 2015) identified off-installation land use within CZs, APZs, and various noise level contours (**Table 3-64** and **Table 3-65**).

Table 3-64. JBSA-Randolph – Existing Off-Base Encroachment within the AICUZ Footprint

	Noise Zones (acres)				APZ (acres)		
Land Use	**65–70 dBA**	**70–75 dBA**	**75–80 dBA**	**80–85 dBA**	**CZ**	**APZ I**	**APZ II**
Residential	335.4	70.3	1.2	1.5	40.2	158.5	560.6
Commercial	133.9	75.3	28.1	2.3	32.0	230.9	40.5
Industrial	0.0	2.2	0.0	0.0	0.2	0.0	1.0
Farm and Ranch	159.3	23.3.	6.5	0.0	3.2	9.3	69.5
Rural/Undeveloped	1,158.7	393.6	108.3	9.6	80.3	795.1	1,043.6
Other	153.7	79.4	0.0	0.0	11.1	183.2	212.7

Source: DAF 2017a

Table 3-65. Seguin AAF – Existing Off-Base Encroachment within the AICUZ Footprint

Land Use	Noise Zones (acres)				APZ (acres)		
	65–70 dBA	70–75 dBA	75–80 dBA	80–85 dBA	CZ	APZ I	APZ II
Residential	71.8	19.8	0.0	0.0	15.6	38.4	17.5
Commercial	5.9	7.7	3.1	0.0	8.2	3.1	13.7
Industrial	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Farm and Ranch	401.6	155.1	0.0	0.0	17.6	175.2	304.9
Rural/Undeveloped	746.9	188.4	0.0	0.0	54.4	388.5	451.3
Other	37.1	38.4	0.0	0.0	19.2	83.7	176.6

Source: DAF 2017a

Noted compatibility concerns at JBSA-Randolph include potential future residential development in the southern APZs, existing urban development within the northern APZs, and the effects on existing and planned residential development within the 70 to 74 dBA noise contour to the south of Runway 33R. Additionally incompatible land use was identified in the CZ both within the boundary of the installation and off-installation. CZ compatibility is a major focus of the IDP at JBSA-Randolph.

At Seguin AAF, off-installation land use compatibility concerns include existing residential development within the CZ and the 70 to 74 dBA noise contour. Residential areas are also located within the northern APZ I and the 65 to 69 and 70 to 74 dBA noise contours.

Foreseeable actions in the Seguin, Texas area include the construction of over 12,000 new residential units in various locations in Seguin. The City of Seguin Economic Development Corporation has published a map with a list of proposed new subdivisions that are currently under construction or planned for construction. **Figure 3-27** was downloaded from their website (https://www.seguinedc.com/media/userfiles/subsite_89/files/Housing%20Maps/Housing_Oct2021map.pdf) and shows the relative locations of these subdivisions as of October 2021.

JBSA-Lackland AICUZ. The 2019 AICUZ study for JBSA-Lackland (DAF 2019) focused on the effects of the Kelly Field Annex runways (**Table 3-66**) and identified off-installation land use within CZs, APZs, and various noise level contours.

Compatibility concerns at JBSA-Lackland include residential development within 65 to 74 dBA noise contours to the southwest and within the 75 to 79 dBA contour to the northwest. Incompatible residential development is also located within the southern APZ 1. Future development concerns within APZs and noise zones are not anticipated due to existing land use controls, development review procedures, and zoning overlays.

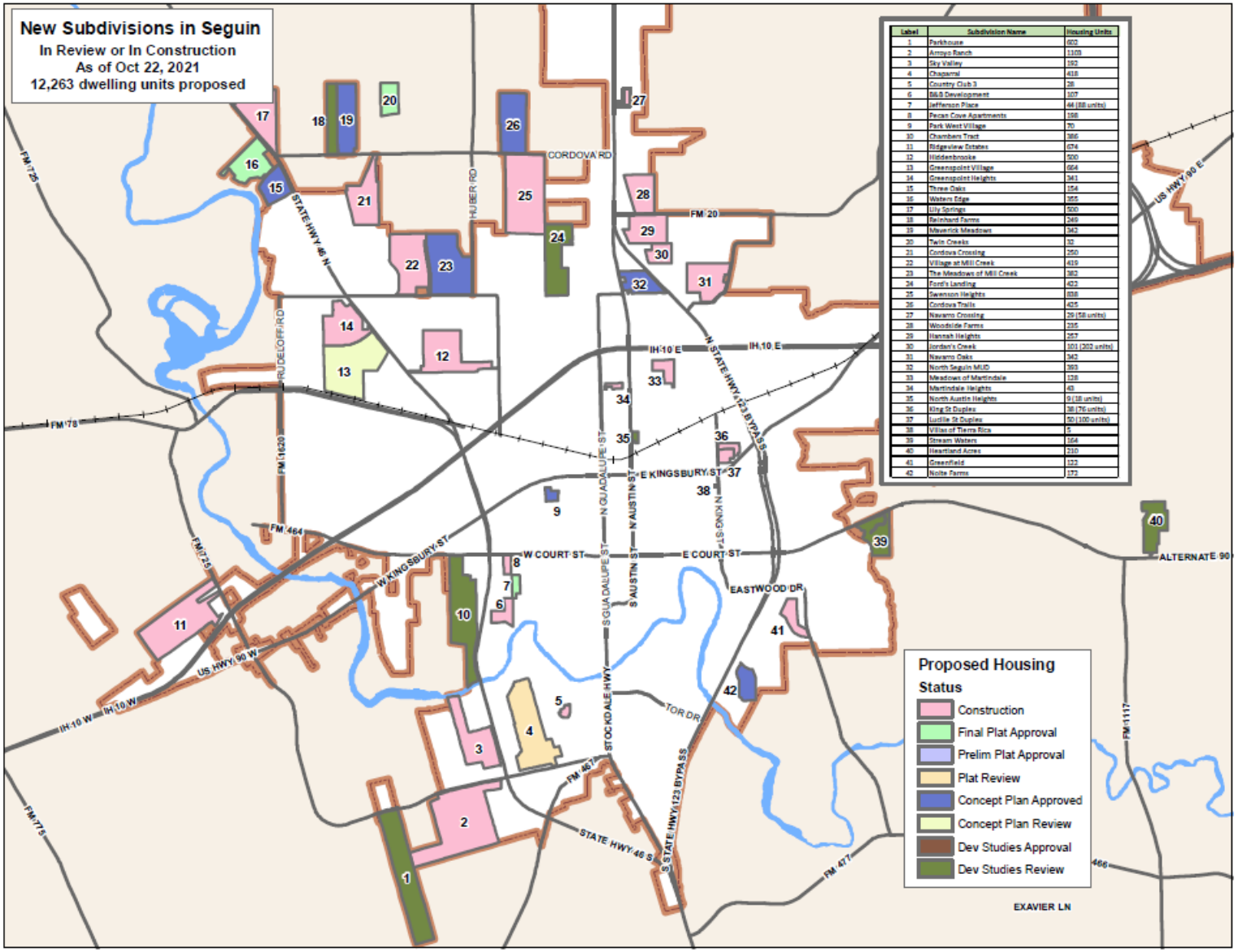


Figure 3-27. New Subdivisions in Seguin, Texas

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Table 3-66. JBSA-Lackland – Existing Encroachment within the AICUZ Footprint

Land Use	Noise Zones (acres)				APZ (acres)		
	65–69 dBA	70–74 dBA	75–79 dBA	80–85 dBA	CZ	APZ I	APZ II
Residential	480.0	116.8	37.4	12.8	1.4	96.0	330.5
Commercial	160.4	62.8	6.5	0.7	0.3	117.1	163.2
Office and Business Park	12.8	0.1	0.6	0.0	0.3	1.9	3.3
Industrial	67.0	48.8	0.8	0.0	0.0	78.2	1.0
Institutional	26.4	0.1	0.0	0.0	0.0	1.8	46.6
Agricultural	459.5	91.6	0.4	0.0	0.1	103.5	237.7
Transportation	7.06	2.0	4.7	0.7	1.0	0.3	12.7
Vacant	259.1	152.1	33.0	0.3	17.6	108.9	65.0
Other	4.3	0.3	1.1	0.0	0.1	1.6	1.1

Source: DAF 2019

REPI Program. The DoD REPI program strives to protect the military's ability to accomplish its training, testing, and operational mission by helping to avoid or remove land-use conflicts near installations and addressing regulatory restrictions that may inhibit military activities (DoD 2021b). The program funds projects across three primary integrated components: encroachment management, landscape partnerships, and stakeholder engagement. Encroachment management projects encourage compatible land use and preservation of natural lands through cost-sharing land acquisition or easement strategies with state and local governments and private conservation organizations. Landscape partnerships seek to address broader, large-scale landscape conservation initiatives with federal and state partners. The development of policy, regulatory, and planning solutions to incompatible development and sustainability issues are pursued collaboratively with stakeholder governments (federal, state, and local), often in concert with associated encroachment and landscape initiatives.

REPI programs are currently in place at both JBSA-Randolph and JBSA-Lackland. At JBSA-Randolph, DAF is developing Installation Encroachment Management Teams to work directly with local municipalities in reviewing development project and land use management proposals (DoD 2021c). Additionally, activities of these teams will focus on increased community engagement and improved relations and to highlight the value of military installations to the communities. Purchase of development rights to ensure compatible land use is the focus of the REPI program at JBSA-Lackland (DoD 2021d). Landscape conservation initiatives are also being pursued at JBSA-Lackland in partnership with organization such as Green Spaces Alliance and the San Antonio River Authority to protect buffer areas and minimize the expansion of wildlife on to the installation due to the loss of habitat on adjacent off-installation lands.

3.5.3 Environmental Consequences

Land use impacts would be considered significant if the effect was inconsistent or noncompliant with land use management plans or policies, precluded the viability of existing land use, precluded continued use or occupation of an area, was incompatible with adjacent land use to the extent public health or safety is threatened, or conflicted with planning criteria established to ensure the safety and protection of human life.

3.5.3.1 Proposed Action

Installation Land Use. The Proposed Action would involve physical on-installation construction and land use changes at JBSA-Randolph for construction and operation of identified MILCON and FSRM. No land use effects would occur at either JBSA-Lackland or Seguin AAF.

The MILCON and FSRM projects at JBSA-Randolph would be largely compatible and consistent with applicable land use plans and regulations and would have no significant impacts on this resource. Nine existing and 11 future land use categories guide compatible and orderly development on JBSA-Randolph. Most of the MILCON and FSRM projects are proposed within the Aircraft Operations and Maintenance, Airfield Pavement, Administrative, and Industrial land use categories and are compatible development within such categories. However, the MTS and GBTS facilities are proposed within the Outdoor Recreation land use category and would displace a softball field and tennis courts (JBSA 2018a). Construction of these facilities at their proposed location would require changing the land use category to Administrative. The adjoining land use categories are Administrative, Aircraft Operations and Maintenance, and Housing (JBSA 2018a), so this change in category would be consistent with nearby land uses. A new softball field and tennis courts would be constructed within the Open Space/Buffer Zone and Outdoor Recreation categories to replace the lost facilities. Each MILCON and FSRM project would be sited, designed, and constructed consistent with JBSA's Installation Development Plan and JBSA-Randolph's Flight Operations and Support Services Area Development Plans.

Land Use and Airspace. No changes in airspace configurations or boundaries are proposed; therefore, the Proposed Action would meet FAA regulations specific to minimum altitude and avoidance distances. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged.

However, the primary effect of project implementation on land use would be associated with noise generated by T-7A aircraft operations as the T-7A aircraft feature substantially louder operating characteristics in comparison with T-38C aircraft.

Noise analysis completed using NOISEMAP developed estimated areas and population within evaluation noise contours, providing a comparison between existing baseline conditions and each project alternative. The DAF recommends land use compatibility for 5 dBA incremental DNL zones above 65 dBA DNL. Residential is suggested as incompatible with any noise zone above 65 DNL. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65 to 69 and strongly discouraged in DNL 70 to 74. Existing residential development is considered as pre-existing, non-conforming land uses. Analysis of aircraft noise in **Section 3.2** shows that an additional

33,117 people live within the 65 to 70 DNL and 12,439 people within the 70 to 75 DNL for JBSA-Randolph under the Proposed Action. At Seguin, 1,285 people would be within the 65 to 70 DNL and 522 people within the 70 to 75 DNL.

However, as noted above, the City of Seguin Economic Development Corporation has published a map of new subdivisions currently being constructed or planned for construction. **Figure 3-27** shows the labeled subdivisions. The calculated footprint of the 65 dBA DNL contour for Seguin AAF under the Proposed Action would encompass planned areas labeled as numbers 29, 30, 31, 39, and 40. These five planned areas would include a total of 1,175 additional housing units that would be located within the 65 dBA DNL contour.

As noted in **Section 3.2**, implementation of the Proposed Action would account for T-7A aircraft operations at JBSA-Lackland of approximately 1,216 operations per year or 3 operations per day or approximately 1.7 percent of total flight operations. Additionally, the T-7A aircraft are smaller and quieter than the predominant aircraft (F-16s and C-5Ms) operating at JBSA-Lackland. Therefore, the overall noise environment surrounding JBSA-Lackland would be only incrementally dependent on the T-7A operations and would not be perceptibly different with or without them. The same effect (no perceptible difference in noise levels due to the comparatively small influence on total aircraft operations) would occur under the Project Alternatives evaluated; therefore, no detailed assessment of estimated noise effects at JBSA-Lackland have been developed.

Under the Proposed Action, estimated changes in off-installation acreage at JBSA-Randolph and Seguin AAF are presented in **Table 3-67** and **Table 3-68**.

Table 3-67. Change in Areas within Noise Contours – JBSA Randolph – Proposed Action

Noise Contour	Change in Areas Under Noise Contours (acres) – Proposed Action			
	JBSA Randolph			
	On-Base	Percent Change	Off-Base	Percent Change
65-70	269	-61%	28,910	1,281.9%
70-75	536	7.4%	9,638	1,218.5%
75-80	681	53.4%	4,843	2,422,4%
>80	1,426	195.8%	2,557	11,522.7%
Total	**2,913**	**38.0%**	**45,948**	**1,413.4%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
Source: DAF 2020b

Table 3-68. Change in Areas within Noise Contours – Seguin AAF – Proposed Action

Noise Contour	Change in Areas Under Noise Contours (acres) – Proposed Action			
	Seguin AAF			
	On-Base	Percent Change	Off-Base	Percent Change
65–70	18	-85.2%	5,810	300.4%
70–75	121	-32.8%	3,190	527.9%
75–80	179	-34.2%	1,603	3,627.9
>80	647	156.7%	310	310,000% *
Total	**966**	**17.2%**	**10,994**	**449.1%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
*: Zero acres affected under existing conditions
Source: DAF 2020b

3.5.3.1.1 Alternative 1

Land use and airspace effects from fewer T-7A aircraft and T-7A operations for Alternative 1 that are at a lower intensity than the Proposed Action (beginning in 2027) would be slightly less than those described for the Proposed Action (**Table 3-69** and **Table 3-70**).

Table 3-69. Change in Areas within Noise Contours – JBSA Randolph – Alternative 1

Noise Contour	Change in Areas Under Noise Contours (acres) – Alternative 1			
	JBSA Randolph			
	On-Base	Percent Change	Off-Base	Percent Change
65–70	338	-50.8%	21,851	944.5%
70–75	695	39.3%	7,273	894.9%
75–80	571	28.6%	3,845	1,902.6%
>80	1,287	167.0%	1,636	17,377.3%
Total	**2,892**	**37.0%**	**34,605**	**1,039.8%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
Source: DAF 2020b

Table 3-70. Change in Areas within Noise Contours – Seguin AAF – Alternative 1

Noise Contour	Change in Areas Under Noise Contours (acres) – Alternative 1			
	Seguin AAF			
	On-Base	Percent Change	Off-Base	Percent Change
65-70	44	-64.0%	5,347	268.5%
70-75	126	-30.0%	2,754	442.1%
75-80	190	-30.1%	1,385	3,120.9%
>80	606	140.5%	174	174,000% *
Total	**966**	**17.2%**	**9,660**	**382.5%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
*: Zero acres affected under existing conditions
Source: DAF 2020b

Analysis of aircraft noise in **Section 3.2** shows that an additional 26,572 people live within the 65 to 70 DNL and 9,998 people within the 70 to 75 DNL for JBSA-Randolph under the Alternative 1. At Seguin, 821 people would be within the 65 to 70 DNL and 448 people within the 70-75 DNL The impact to the planned new subdivisions in and around Seguin, would be the same as the Proposed Action.

3.5.3.1.2 Alternative 2

Land use and airspace effects from T-7A operations under Alternative 2 that are 15 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action (**Table 3-71** and **Table 3-72**).

Table 3-71. Change in Areas within Noise Contours – JBSA Randolph – Alternative 2

Noise Contour	Change in Areas Under Noise Contours (acres) – Alternative 2			
	JBSA Randolph			
	On-Base	Percent Change	Off-Base	Percent Change
65–70	230	-66.5%	29,756	1,322.4%
70–75	472	-5.4%	10,880	1,388.4%
75–80	732	64.9%	5,250	2,634.4%
>80	1,482	207.5%	2,973	13,413.6%
Total	**2,916**	**38.1%**	**48,860**	**1,509.4%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
Source: DAF 2020b

Table 3-72. Change in Areas within Noise Contours – Seguin AAF – Alternative 2

Noise Contour	Change in Areas Under Noise Contours (acres) – Alternative 2			
	Seguin AAF			
	On-Base	Percent Change	Off-Base	Percent Change
65–70	8	-93.4%	6.104	320.7%
70–75	115	-36.1%	3,620	612.6%
75–80	174	-36.0%	1,827	4,148.8%
>80	670	165.8%	421	421,000% *
Total	**966**	**20.1%**	**11,972**	**498.0%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
*: Zero acres affected under existing conditions
Source: DAF 2020b

Analysis of aircraft noise in **Section 3.2** shows that an additional 33,612 people live within the 65 to 70 DNL and 13,413 people within the 70 to 75 DNL for JBSA-Randolph under the Alternative 2. At Seguin, 1,583 people would be within the 65 to 70 DNL and 565 people within the 70 to 75 DNL. The impact to the planned new subdivisions in and around Seguin, would be the same as the Proposed Action.

3.5.3.1.3 Alternative 3

Land use and airspace effects from T-7A operations under Alternative 3 that are 25 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action (**Table 3-73** and **Table 3-74**).

Table 3-73. Change in Areas within Noise Contours – JBSA Randolph – Alternative 3

Noise Contour	Change in Areas Under Noise Contours (acres) – Alternative 3			
	JBSA Randolph			
	On-Base	Percent Change	Off-Base	Percent Change
65-70	205	-70.2%	30,245	1,345.7%
70-75	450	-9.8%	11,803	16,068.5%
75-80	746	68.0%	5,464	2,745.8%
>80	1,511	213.5%	3,255	14,695.4%
Total	**2,917**	**38.2%**	**55,140**	**1,716.2%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
Source: DAF 2020b

Table 3-74. Change in Areas within Noise Contours – Seguin AAF – Alternative 3

Noise Contour	Change in Areas Under Noise Contours (acres) – Alternative 3			
	Seguin AAF			
	On-Base	Percent Change	Off-Base	Percent Change
65-70	4	-96.7%	6,276	332.5%
70-75	109	-39.4%	3,828	653.5%
75-80	168	-38.2%	1,918	4,360.5%
>80	684	171.4%	494	494,000% *
Total	**966**	**17.2%**	**12,515**	**525.1%**

Note: Percent change represents Proposed Action estimate versus Existing Conditions
*: Zero acres affected under existing conditions
Source: DAF 2020b

Analysis of aircraft noise in **Section 3.2** shows that an additional 33,917 people live within the 65 to 70 DNL and 14,126 people within the 70 to 75 DNL for JBSA-Randolph under the Alternative 3. At Seguin, 1,749 people would be within the 65 to 70 DNL and 589 people within the 70 to 75 DNL. The impact to the planned new subdivisions in and around Seguin, would be the same as the Proposed Action.

3.5.3.2 No Action Alternative

The No Action Alternative would not result in any changes in land use, either on-installation or surrounding areas off-installation at JBSA-Randolph, Seguin AAF, or JBSA-Lackland. The proposed MILCON and FSRM projects at JBSA-Randolph would not be completed and no related advancement on the installation IDP would occur. As no changes in aircraft operations would occur, noise conditions on- and off-base would remain unchanged when compared with existing conditions.

3.5.4 Mitigation

As shown in the above comparison tables in **Section 3.5.3**, implementation of the Proposed Action or any of the Project Alternatives would significantly expand noise contours and increase lands and uses subject to noise levels which may be deemed incompatible. Recognizing that the operational characteristics of the T-7A aircraft are still in a preliminary stage, adaptive management approaches for addressing noise impacts (e.g., reduced power settings, anticipated afterburner requirements, etc.), the ultimate noise contours and associated land use effects are anticipated to be reduced at both JBSA-Randolph and Seguin AAF. DAF would continue to evaluate flight characteristics for T-7A training to determine the safest, most efficient, and least intrusive operations considering both mission requirements and airspace effects.

Applying the mitigation discussed in **Section 3.2** for aircraft noise by reducing power settings would result in a smaller set of noise contours around Seguin AAF for each of the alternatives. The smaller footprints for the Proposed Action and each of the alternatives would not encompass any of the planned new subdivisions as proposed by the City of Seguin Economic Development Corporation and therefore the planned housing unit land use would be compatible with the proposed T-7A aircraft operations at Seguin AAF.

Other Planning Actions. DAF is committed to working with the Alamo Area Regional Council or Governments, Bexar and Guadalupe Counties, the City of Schertz, Universal City, Seguin, and other local communities to analyze compatible use surrounding JBSA-Randolph and Seguin AAF under the ultimate T-7A operating conditions. As part of that commitment, DAF will continue to partner with local governments to perform the following tasks:

- Prepare an AICUZ Update to address any increases of land area within the greater than 65 dBA DNL noise contours for both JBSA-Randolph and Seguin AAF.
- Fully implement the noise abatement strategies outlined in the 2015 JLUS and the 2021 RCUP.
- Coordinate with state and local agencies on compatible land use and potential encroachment concerns inside and outside of the DNL footprint (i.e., large-scale developments, transportation projects that could encourage development, or tall structures such as cell towers that could penetrate airfield imaginary surfaces.
- Encourage municipalities to promote the highest and best use of land by updating local zoning ordinances and building construction standards, especially for high-noise areas.
- Encourage municipalities to adopt legislative initiatives to acquire interest in developed properties in order to curb and mitigate encroachment near military installations and to protect the public from noise exposure and accident potential.

DAF will also continue to pursue DoD REPI funds to further implement strategic land use acquisitions, controls, and landscape improvements associated with incompatible use concerns.

3.6 Hazardous Materials and Wastes

3.6.1 Definition of the Resource

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Hazardous materials are defined by 49 CFR § 171.8 as hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR § 173. Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 USC § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Petroleum products include crude oil or any derivative thereof, such as gasoline, diesel, or propane. They are considered hazardous materials because they present health hazards to users in the event of incidental releases or extended exposure to their vapors.

Evaluation of hazardous materials and wastes focuses on the storage, transportation, handling, and use of hazardous materials as well as the generation, storage, transportation, handling, and disposal of hazardous wastes. In addition to being a threat to humans, the improper release or storage of hazardous materials, hazardous wastes, and petroleum products can threaten the health and well-being of wildlife species, habitats, soil systems, and water resources.

Toxic Substances. Toxic substances are substances that might pose a risk to human health and are addressed separately from hazardous materials and hazardous wastes. Toxic substances include asbestos-containing materials (ACMs), lead-based paint (LBP), and polychlorinated biphenyls (PCBs), all of which are typically found in older buildings and utilities infrastructure. USEPA is given authority to regulate these substances by the Toxic Substances Control Act (15 USC § 53).

Asbestos is regulated by USEPA under the CAA; Toxic Substances Control Act; and Comprehensive Environmental Response, Compensation, and Liability Act. USEPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM. USEPA has implemented several bans on various ACMs between 1973 and 1990, so ACMs are most likely in older buildings (i.e., constructed before 1990). ACMs are generally found in building materials such as floor tiles, mastic, roofing materials, pipe wrap, and wall plaster. LBP was commonly used prior to its ban in 1978; therefore, any building constructed prior to 1978 may contain LBP. PCBs are man-made chemicals that persist in the environment and were widely used in building materials (e.g., caulk) and electrical products prior to 1979. Structures constructed prior to 1979 potentially include PCB-containing building materials.

Environmental Contamination. The Comprehensive Environmental Response, Compensation, and Liability Act governs the response or cleanup actions to address releases of hazardous substances, pollutants, and contaminants into the environment and includes federal facilities such as JBSA. The Defense Environmental Restoration Program was formally

established by Congress in 1986 to provide for the cleanup of DoD property at active installations, Base Realignment and Closure installations, and formerly used defense sites throughout the United States and its territories. The two restoration programs under the Defense Environmental Restoration Program are the Environmental Restoration Program (ERP) and the Military Munitions Response Program (MMRP). The ERP addresses contaminated sites while the MMRP addresses nonoperational military ranges and other sites suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituents. Each site is investigated, and appropriate remedial actions are taken under the supervision of applicable federal and state regulatory programs. When no further remedial action is necessary for a given site, the site is closed, and it no longer represents a threat to human health.

Radon. Radon is a naturally occurring odorless and colorless radioactive gas found in soils and rocks that can lead to the development of lung cancer. Radon tends to accumulate in enclosed spaces usually those that are below ground and poorly ventilated (e.g., basements). USEPA established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences, and radon levels above this amount are considered a health risk to occupants.

Polyfluoroalkyl Substances (PFAS). DAF is currently investigating potential effects related to chemicals known as per- and polyfluoroalkyl substances (i.e., PFAS). This family of chemicals was developed in the 1940s and include the chemicals perfluorooctane sulfonate and perfluorooctanaoic acid. Aqueous film forming foam (AFFF) containing PFAS was developed in the early 1960s and used at U.S. airports, municipal fire stations and airport, petroleum facilities, and other industries to effectively extinguish hydrocarbon-based fires. Fire fighters at military installations regularly used in emergencies or trained with AFFF in an unconfined manner.

3.6.2 Affected Environment

Hazardous Materials, Hazardous Wastes, and Petroleum Products. DAF uses hazardous materials and petroleum products such as liquid fuels, pesticides, and solvents for everyday operations at JBSA. The use of these hazardous materials and petroleum products results in the generation and storage of hazardous wastes and used petroleum products on the installation. JBSA-Randolph is a RCRA Small Quantity Generator (USEPA identification number TX8571524117) (JBSA 2016a). RCRA Small Quantity Generators generate between 100 to 1,000 kilograms of hazardous waste in any one month. Of the facilities subject to renovation, hazardous materials, hazardous wastes, and petroleum products are used and generated at Hangars 5 and 63 (JBSA 2018b, JBSA 2016b).

DAF installations manage hazardous materials through Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*. JBSA has implemented installation-wide spill prevention, control and countermeasure (SPCC); pollution prevention (P2); and hazardous waste management plans. These plans define roles and responsibilities, address record keeping requirements, and provide spill contingency and response requirements (JBSA 2018b, JBSA 2016a, JBSA 2016b).

Toxic Substances. ACMs on JBSA are managed in accordance with the installation's asbestos operating plan. The plan addresses asbestos management practices throughout JBSA. The plan is designed to 1) protect personnel who live and work on JBSA from exposure

to airborne asbestos fibers, and 2) ensure JBSA remains in compliance with all DAF, federal, state, and local asbestos regulations. The plan assigns responsibilities, establishes inspection and repair capabilities, and provides repair procedures and personal protection instructions (JBSA 2018c). Facilities constructed prior to 1990 have the greatest potential to contain ACMs in building materials. Of the facilities subject to renovation, Hangars 5, 6, 12, 13, 63, and 72 and Building 220 were constructed prior to 1990.

The JBSA LBP Management Plan provides guidance to properly manage LBP within JBSA facilities. The plan is designed to 1) protect personnel who live and work on JBSA from exposure to airborne Pb and damaged painted surfaces and 2) ensure JBSA remains in compliance with all DAF, federal, state, and local LBP regulations. The most important line of defense in the protection of human health at JBSA is the dissemination of information regarding the presence of LBP in buildings. The locations of LBP in facilities are communicated to appropriate personnel in order to identify potential hazards and avoid disturbance of affected building materials (JBSA 2017). Facilities constructed prior to 1978 have the greatest potential to contain LBPs. Of the facilities subject to renovation, Hangars 5, 6, 12, 13, 63, and 72 and Building 220 were constructed prior to 1978.

Facilities constructed prior to 1979 have the greatest potential to contain PCBs in building material. Older electrical infrastructure, such as light fixtures and surge protectors, within these buildings might also contain PCBs. Of the facilities subject to renovation, Hangars 5, 6, 12, 13, 63, and 72 and Building 220 were constructed prior to 1979.

Environmental Contamination. This EIS focuses only on the active environmental contamination sites that have potential to be impacted by the Proposed Action and alternatives. Sites that require no further action; do not directly coincide with MILCON or FSRM projects; or would not be impacted by the proposed work activities are not discussed further in this EIS. None of JBSA's ERP or MMRP sites represent impediments to the Proposed Action and alternatives (AFCEC/CZOW 2019).

Radon. USEPA rates all counties in south Texas, including Bexar and Guadalupe Counties, as radon zone 3. Counties in zone 3 have a predicted average indoor radon screening level less than 2 pCi/L (USEPA 2021b).

PFAS. The Air Force Civil Engineer Center has prepared a JBSA-Randolph overview for perfluorooctane sulfonate and perfluorooctanaoic acid and results indicate that no AFFF release areas were in the vicinity of the MILCON or FRSM projects for T-7A recapitalization (AFCEC 2019).

3.6.3 Environmental Consequences

Impacts on or from hazardous materials and wastes would be considered significant if a proposed action would result in noncompliance with applicable federal or state regulations, or increase the amounts generated or procured beyond current management procedures, permits, and capacities. Impacts on contaminated sites would be considered significant if a proposed action would disturb or create contaminated sites resulting in negative impacts on human health or the environment, or if a proposed action would make it substantially more difficult or costly to remediate existing contaminated sites.

3.6.3.1 Proposed Action

Hazardous Materials, Hazardous Wastes, and Petroleum Products. Short-term, minor, adverse impacts would occur from the use of hazardous materials and petroleum products and the generation of hazardous wastes during construction for the MILCON and FSRM projects. Hazardous materials that could be used include paints, welding gases, solvents, preservatives, and sealants. Additionally, hydraulic fluids and petroleum products, such as diesel and gasoline, would be used in the vehicles and equipment supporting facility construction. Construction would generate negligible to minor quantities of hazardous wastes. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and state laws. All hazardous materials, petroleum products, and hazardous wastes used or generated during construction would be contained, stored, and managed appropriately (e.g., secondary containment, inspections, spill kits) in accordance with applicable regulations to minimize the potential for releases. All construction equipment would be maintained according to the manufacturer's specifications and drip mats would be placed under parked equipment as needed. Hazardous materials, hazardous wastes, and petroleum products currently within the affected portions of Hangars 5 and 63 would be relocated to similar facilities to accommodate the proposed renovation of these hangars.

New hazardous materials storage and hazardous waste collection points would be established, as necessary, and most likely would be sited in the MTS Facility, Hush House Pad, Fuel Cell Facility, and Hangar 13 based on anticipated building function. The JBSA SPCC, P2, and hazardous waste management plans would be amended, as needed, for any new hazardous material, hazardous waste, or petroleum product capabilities. These plans would continue to be followed to lessen the potential for a release.

Short-term, minor, adverse impacts would occur from a temporary increase in the use of hazardous materials and petroleum products and hazardous wastes generation during the T-38C to T-7A transition period when the number of aircraft on JBSA-Randolph peaks. Additional quantities of hazardous materials, hazardous wastes, and petroleum products would be delivered, stored, used, and disposed of appropriately at JBSA-Randolph for maintenance of the additional aircraft. However, JBSA-Randolph is anticipated to have enough delivery, storage, and disposal capacity to accommodate the increased hazardous materials, petroleum products, and hazardous wastes requirements. The quantities of hazardous materials, petroleum products, and hazardous wastes required for maintenance of individual T-7A aircraft would be similar and proportional to those required for the T-38Cs. No long-term impacts would occur because the use of hazardous materials and petroleum products and the generation of hazardous wastes for routine aircraft maintenance would return to similar levels as baseline following the T-38C to T-7A transition period when the number of aircraft on JBSA-Randolph drops by 19. No aircraft maintenance would occur at JBSA-Lackland or Seguin AAF; therefore, no changes to hazardous material, hazardous waste, and petroleum product volumes would occur at these JBSA installations.

The proposed increase in aircraft operations would also require additional quantities of jet fuel to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to less the potential

for a release. No refueling would occur at JBSA-Lackland or Seguin AAF; therefore, no additional quantities of jet fuel would be needed at these JBSA installations.

Toxic Substances. Short-term, minor, adverse impacts from toxic substances might occur from the demolition and renovation of buildings potentially containing ACMs, LBP, and PCBs. Surveys for these substances would be completed, as necessary, by a certified contractor prior to work activities to ensure that appropriate measures are taken to reduce potential exposure to, and release of, these substances. Contractors would wear appropriate personal protective equipment (PPE) and would be required to adhere to all federal, state, and local regulations as well as the installation's management plans for toxic substances. All ACM- and LBP-contaminated debris would be disposed of at a USEPA-approved landfill. New building construction is not likely to include the use of these substances because federal policies and laws limit their use in building construction applications. Long-term, negligible, beneficial impacts through renovation and demolition would occur from reducing the potential for future human exposure to and reducing the amount of ACMs, LBP, and PCBs to maintain at JBSA-Randolph. No ACMs, LBP, or PCBs would be disturbed at JBSA-Lackland and Seguin AAF because no building demolition or renovation would occur at these installations.

Environmental Contamination. No impacts from JBSA's ERP or MMRP sites would occur. As stated in **Section 3.6.2**, none of JBSA's ERP or MMRP sites represent impediments to the Proposed Action.

Contractors performing construction could encounter undocumented soil or groundwater contamination. If soil or groundwater that is believed to be contaminated were discovered, the contractor would be required to immediately stop work, report the discovery to the installation, and implement appropriate safety measures. Commencement of field activities would not continue in this area until the issue was investigated and resolved.

Radon. No impacts from radon would occur because all counties of the Proposed Action have a low potential for radon accumulation greater than 2 pCi/L within buildings.

PFAS. No impacts from PFAS or to identified PFAS sites would occur. Construction activities would avoid identified release locations.

3.6.3.1.1 Alternative 1

Impacts on hazardous materials and wastes from fewer T-7A aircraft and T-7A operations that are at a lower intensity than the Proposed Action (beginning in 2027) would be slightly less than those described for the Proposed Action. Compared to the Proposed Action, fewer aircraft to maintain and aircraft operations at a lower intensity would decrease the quantities of hazardous materials, hazardous wastes, and petroleum products to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release. No aircraft maintenance or refueling would occur at JBSA-Lackland or Seguin AAF; therefore, no additional quantities of hazardous materials, hazardous wastes, and petroleum products would be needed at these JBSA installations. Identical impacts on hazardous materials and wastes would occur from installation of only 52 T-7A shelters (rather than 65 shelters under the

Proposed Action), a different interior design for the GBTS facility, and the addition/alteration to Building 38.

3.6.3.1.2 Alternative 2

Impacts on hazardous materials and wastes from T-7A operations that are 15 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action. The increase in operations would require additional quantities of hazardous materials, hazardous wastes, and petroleum products, most notably jet fuel, to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph as compared to the Proposed Action. However, JBSA-Randolph is anticipated to have enough delivery, storage, and disposal capacity to accommodate the increased hazardous materials, petroleum products, and hazardous wastes requirements. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release. No aircraft maintenance or refueling would occur at JBSA-Lackland or Seguin AAF; therefore, no additional quantities of hazardous materials, hazardous wastes, and petroleum products would be needed at these JBSA installations.

3.6.3.1.3 Alternative 3

Impacts on hazardous materials and wastes from T-7A operations that are 25 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action and Alternative 2. The increase in aircraft operations would require additional quantities of hazardous materials, hazardous wastes, and petroleum products, most notably jet fuel, to be delivered, stored, used, and disposed of appropriately at JBSA-Randolph as compared to the Proposed Action and Alternative 2. However, JBSA-Randolph is anticipated to have enough delivery, storage, and disposal capacity to accommodate the increased hazardous materials, petroleum products, and hazardous wastes requirements. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release. No aircraft maintenance or refueling would occur at JBSA-Lackland or Seguin AAF; therefore, no additional quantities of hazardous materials, hazardous wastes, and petroleum products would be needed at these JBSA installations.

3.6.3.2 No Action Alternative

The No Action Alternative would not impact hazardous materials and wastes. No facility construction would occur, and there would be no changes in aircraft operations. Additional quantities of hazardous materials, petroleum products, and hazardous wastes would not be used, stored, or generated, and the management of hazardous materials, petroleum products, and hazardous wastes would not change. Toxic substances would remain and would continue to require maintenance by DAF personnel. No impacts on environmental contamination sites and radon would occur. Hazardous materials and wastes conditions at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged when compared to the existing conditions described in **Section 3.6.2**.

3.7 Infrastructure and Transportation

3.7.1 Definition of the Resource

Infrastructure consists of the physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made with a high correlation between the type and extent of infrastructure and the degree of which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include airfield pavements, liquid fuel, communications system, electrical system water supply system, wastewater system, stormwater system, natural gas system, and solid waste management. Airfield pavement condition is expressed in terms of Pavement Condition Index (PCI), which is a numerical rating from 0 (worst) to 100 (best) of the pavement condition based on the type and severity of distresses observed on the pavement surface and is determined by visual inspection. Airfield pavement with PCI of 70 or greater is considered to be in satisfactory or good condition, while airfield pavement with a PCI less than 55 is considered to be in poor or serious condition (FAA 2015).

Transportation refers to major and minor roadways that feed into an installation and the roadways, traffic patterns, and parking areas on an installation. Public transit, rail, and pedestrian networks are also elements of transportation. Street and highway operations are primarily regulated by the Federal Highway Administration and implemented by the Texas Department of Transportation. Local street operations and maintenance are managed by the City of San Antonio and JBSA. Roadway transportation conditions are evaluated using capacity estimates that depend on several factors including number of lanes, width of lanes, roadway gradient, obstructions, bus and truck volumes, and other physical characteristics of the roadway network. Operation of roadway segments and intersections are expressed in terms of Level of Service (LOS), which ranges from A (best) to F (worst). The LOS is a measure of operational conditions within a traffic stream based on service measures such as speed, travel time, freedom to maneuver, traffic interruptions, and convenience. The City of San Antonio considers LOS A through C to be acceptable, while LOS D through F are unacceptable (City of San Antonio 2009).

3.7.2 Affected Environment

Because only touch-and-go operations would occur at JBSA-Lackland and Seguin AAF and no MILCON and FSRM projects would occur at these installations, analysis of existing conditions at JBSA-Lackland and Seguin AAF is limited to airfields. All fueling and maintenance activities for T-7A operations would take place at JBSA-Randolph, and no fueling and maintenance would occur at JBSA-Lackland or Seguin AAF. Therefore, the existing condition of transportation networks and infrastructure such as the liquid fuel, communications, electrical, water supply, wastewater, stormwater, natural gas, solid waste, and heating/cooling systems at JBSA-Lackland and Seguin AAF were not analyzed. Likewise, because aircraft operations would have no impacts on infrastructure and transportation, the airspace areas were not analyzed in this resource section.

Infrastructure

Airfield Pavements. There are two runways at JBSA-Randolph, which include the east runway (Runway 15L/33R) and the west runway (Runway 15R/33L). The east runway is 8,351 feet × 200 feet with concrete paving. The west runway is 8,352 feet × 200 feet with the first 1,000 feet of 15R and first 2,500 feet of 33L constructed from concrete, while the rest is asphalt. Airfield pavements at JBSA-Randolph are considered to be in good condition with an average PCI of 85 and 3 percent (405,562 ft^2) of airfield pavement below PCI 55. The west runway does not meet United Facilities Criteria (UFC) guidelines for minimum slope standards and is prone to flooding, which occurs greatest at the southern end of the runway. In addition, the airfield pavement at JBSA-Randolph contains a total of 298 aircraft parking spaces with 137 spaces in use. Approximately 27 percent of aircraft parking is for T-38C aircraft and T-6 aircraft, respectively (JBSA 2018a).

The JBSA-Lackland airfield (i.e., Kelly Field Annex), within the eastern portion of the installation, contains one 11,500 foot-long × 300-foot-wide asphalt concrete runway (Runway 15/33) with 1,000-foot overruns at each end. The airfield provides access for civilian users east of the runway, as well as for DAF, which accesses the runway from the west (DAF 2019). Minor pavement degradation has occurred from weathering over time; however, airfield pavements at JBSA-Lackland are considered to be in good condition with an average PCI of 83 and 1 percent (75,932 ft^2) of airfield pavement below PCI 55 (JBSA 2018a).

Seguin AAF contains a single, 8,325-foot long × 150-foot-wide runway (Runway 13/31) consisting of asphalt paving with unpaved shoulders. The airfield pavement at Seguin AAF was completely replaced in 2016 and is considered to be in good condition. The latest analysis determined that 66 percent of airfield pavement had a PCI value above 70, while 33 percent of the pavement had a PCI value below 55 (JBSA 2018a).

Liquid Fuel. JBSA-Randolph maintains fuel storage tanks that store jet A fuel, diesel, and gasoline. The current daily fuel storage capacity at the installation is 1,344,511 gallons. Liquid fuel storage facilities include two bulk jet A fuel tanks built in 1951 with 840,000-gallon and 420,000-gallon capacities, respectively. Fuels for aircraft operations are delivered from the jet A fuel bulk storage facilities to the aircraft via fuel trucks. The current jet fuel supply at JBSA-Randolph is sufficient to support current and future aircraft operations; however, ongoing tank maintenance and repairs and upgrades to the aging fuel delivery system are needed to ensure mission risks are averted (JBSA 2018a, JBSA 2018b). All fuel storage tanks are maintained in accordance with the installation's SPCC Plan, in accordance with 40 CFR § 112, *Oil Pollution Prevention*, to prevent unauthorized discharges (see **Section 3.6**).

Communications System. JBSA-Randolph employs a Base Information Transport Infrastructure communications system that includes both wired and wireless components and has been recently upgraded. In accordance with the Base Information Transport Infrastructure program, the wired communications component includes base network infrastructure capabilities for fixed Air Force Active Duty installations and the wireless communications component incorporates administration for wireless entry into the base Local Area Network (DoD 2016). The overall communications system at JBSA-Randolph has excess capacity to support the JBSA-Randolph mission needs; however, system improvements, including the

separation of airfield systems and east-installation systems, would be required to support future mission expansion (JBSA 2018a).

Electrical System. Electrical power at JBSA-Randolph is provided by San Antonio City Public Service Energy through one primary on-installation substation, four 13.3-kilovolt feeder lines, and two secondary substations. San Antonio City Public Service Energy sources power from a variety of sources including coal plants, natural gas plants, and wind power facilities. The existing capacity of the substation is 21 megawatts (MW), which is sufficient to meet the installation's estimated electricity demand of 16 MW. The average electrical demand for JBSA-Randolph is 16 MW. The electrical distribution system is completely underground, and all new electrical infrastructure is required to be placed underground. Overall, the condition of the electrical infrastructure at JBSA-Randolph is considered to be adequate; however, one of the electrical feeders requires upgrades and two secondary substations need to be replaced (JBSA 2018a).

Water Supply System. Potable water at JBSA-Randolph is sourced from three on-installation wells that are part of the Edwards Aquifer, one of the most prolific artesian aquifers in the world. There are also five water wells on the installation that are currently not used. Additionally, there are two water storage tanks on the installation. The historic Taj Mahal (Building 100) has a capacity of 500,000 gallons and a secondary storage tank (Facility 864) has a capacity of 550,000 gallons. Water for the hangar's fire protection system is stored in Tank 51 near the airfield. The water delivery system is comprised of 74 miles of water mains that were initially installed as cast iron in the 1930s and have been replaced with polyvinyl chloride piping. Approximately 25 percent of the water delivery piping system is new within the last 10 years while upgrades to lines in poor condition are planned. Water supply and delivery is mostly contained within a loop system with a dead-end near Building 1164 that is routinely flushed automatically to maintain water quality. Additionally, JBSA-Randolph personnel rotate the use of the water pumps periodically to keep them in working order (JBSA 2018a).

The total capacity of the installation's water distribution system is 2,831,000 gpd, which is adequate to meet the current average demand of 540,700 gpd and peak demand of 1,132,000 gpd. Water leak detection is needed throughout the water supply and distribution system to account for consumption and discharge discrepancies. Specifically, 50 percent less sewage is discharged than what is pumped from the wells. In addition, JBSA-Randolph has plans to install gray-water collection systems, supply a backup water source for the installation, and schedule replacement of all system components including water mains, hydrants, and valves (JBSA 2018a).

Wastewater System. The wastewater system at JBSA-Randolph is privatized to the San Antonio River Authority. Wastewater is discharged to the Cibolo Creek Municipal Authority (CCMA) treatment facility from a pump station on the northeast side of the installation. JBSA-Randolph is entitled to 70 percent of what it discharges to CCMA as reclaimed water, of which only 20 percent is currently used for golf course operations at the southern perimeter of the installation. The current wastewater discharge capacity at JBSA-Randolph is 281,348 gpd (JBSA 2018a). The average daily wastewater discharge in 2020 was 246,545 gpd. The maximum daily discharge during the month of April 2021 was 348,000 gpd, which is greater

than the discharge capacity and shows that the system is capable of handling occasional discharges in excess of its capacity (AFCEC/CZOW 2021).

Discharge to CCMA slightly increases during major rain events due to weathered sanitary sewer infrastructure that allows seepage into the system. The San Antonio River Authority is responsible for maintenance and replacement of the nearly 100-year-old clay wastewater lines on the installation and is required under a 50-year Utilities Privatization Contract to replace 50 percent of all clay sewer lines by 2053. Ongoing system upgrades would address existing sewer overflow concerns, of which 75 percent occur from blockages in the system (e.g., debris and tree roots) and the remaining 25 percent occur primarily from major rainfall events.

Stormwater System. Stormwater at JBSA-Randolph is managed by runoff, a series of detention basins, and underground storm sewer piping with outfalls to Cibolo Creek and Woman Hollering Creek. There are three stormwater outfalls that flow into Cibolo Creek at the northeast installation perimeter and Woman Hollering Creek at the southern installation perimeter. The stormwater infrastructure was initially installed between the 1930s and 1950s and has required minimal maintenance. The system is comprised of mostly concrete piping (approximately 75 percent) and some clay materials (approximately 25 percent). During heavy rainfall periods, smaller facilities with limited underground infrastructure capacity tend to flood, which causes surface weathering over time. Additionally, there is insufficient drainage on the west runway causing frequent flooding and progressive surface degradation (JBSA 2018a).

Natural Gas System. Natural Gas at JBSA-Randolph is supplied by Kinder Morgan and CenterPoint Energy and approximately 80 percent of installation buildings are metered for natural gas use. Natural gas pipeline distribution capacity is 4 billion cubic feet per day, while the average demand is approximately 43.2 million cubic feet per day. Underground natural gas lines are primarily located along roadways and in residential areas (JBSA 2018a).

Solid Waste Management. All municipal solid waste from JBSA-Randolph is collected and disposed of off-installation by private contract disposal services (JBSA 2018a). Solid waste is disposed of at the Covel Gardens Landfill, a Type I Municipal Solid Waste Landfill less than 3 miles southwest of the installation. The landfill has a permitted capacity of 124.1 million cubic yards with a remaining capacity of 110.5 million cubic yards (approximately 89 percent) and is authorized under TCEQ Permit No 2029B (Waste Management 2021).

In 2017, JBSA implemented a mandatory recycling program and requires paper products, cardboard, newspaper, metal, plastic, glass, used oil, Pb acid batteries, pallets, and toner cartridges to be recycled (DAF 2017b). During fiscal year 2012, JBSA-Randolph produced approximately 5,000 tons of non-hazardous waste and 55,000 tons of construction waste. Of which, approximately 44 percent of non-hazardous waste and 98 percent of construction waste was diverted from landfills through recycling or reuse programs (JBSA 2018a).

Heating/Cooling System. Facilities at JBSA-Randolph are cooled using four on-installation chilled-water plants. Three chilled-water plants on the east side of the installation have a combined estimated capacity of 6,000 tons and one chilled-water plant on the west side of the installation has an estimated capacity of 1,000 tons. Together the four plants provide cooling to approximately 80 percent of the buildings on the installation. Additionally, Building 991 houses

three 500-ton chillers and a thermal energy storage system with a 1,000,000-gallon capacity. Facilities on the installation are heated with boilers as there is no central heating system. JBSA-Randolph has plans to create a looped system connecting the three east-side chilled-water plants and to replace all existing 12-inch connection pipes with 14-inch pipes (JBSA 2018a).

Transportation

Regional Roadways. All JBSA installations are connected by local and regional transportation networks, which include Interstate (I-) 10, I-35, and I-37, as well as U.S. Highway 90, which runs in an east/west direction and U.S. Highway 281, which runs in a north/south direction.

JBSA-Randolph is bounded by Loop 1604 to the east, Farm to Market Road (FM) 78 to the north, FM 1518 and East Perimeter Road to the east, and Lower Seguin Road to the south. Regional access to JBSA-Randolph is provided by FM 78, a primary arterial roadway along the northern installation perimeter, and Lower Seguin Road, a secondary arterial roadway along the southern installation perimeter. These arterial roadways connect the installation with surrounding highways and communities in all directions. FM 78 connects to Harmon Drive, West 3rd Street, and East 5th Street, at the north perimeter of the installation where three of the four installation access gates are located. Lower Seguin road connects with Golf Road at the south perimeter of the installation where the South Gate is located. Regional roadways are generally LOS C or higher; however, intermittent gate closures and congestion at installation gates can cause traffic to backup just outside of the installation and temporarily reduce the LOS of affected roadways (JBSA 2018a). Major roadway improvement projects along Loop 1604 and FM 1518, outside of the installation, are underway to address congestion issues and accommodate current and future traffic volumes (TxDOT 2021a).

Gate Access. JBSA-Randolph can be accessed from four gates, or access control points (ACPs). The operating ACPs include the Main Gate on Harmon Drive off of the four-lane arterial road, FM 78; the West Gate on West 3rd Street off of FM 78 approximately 0.2 miles west of the Main Gate; the East Gate on East 5th Street off of FM 78 approximately 0.3 miles east of the Main Gate; and the South Gate on Golf Road at the south end of JBSA-Randolph.

The Main Gate operates 24 hours a day with the capacity to process 1,500 vehicles per hour with peak hourly demand of 1,343 vehicles (JBSA 2018a). While hourly capacity has not been reached, the Main Gate is subject to frequent congestion, which compromises vehicle processing standards. The West Gate operates weekdays from 6 a.m. to 6 p.m. and has the capacity to process 850 vehicles per hour with peak hourly demand of 743 vehicles. The East Gate operates weekdays from 6 a.m. to 8:30 a.m. for inbound traffic and 3 p.m. to 6 p.m. for outbound traffic and has the capacity to process 1,050 vehicles per hour with peak hourly demand of 900 vehicles. The South Gate, designated for commercial vehicles only, operates weekdays from 6 a.m. to 8:30 a.m. for inbound traffic and 8:30 a.m. to 6 p.m. for all traffic and has the capacity to process 800 commercial vehicles per hour with peak hourly demand of 680 vehicles. The JBSA-Randolph gates are subject to routine closures during construction or for holidays and AETC family days. All gates can be accessed by active-duty members, retirees and their dependents, Civil Service employees, and escorted visitors, while unescorted visitors require additional credentials (JBSA 2018a, JBSA 2019a). The vehicle processing capacity of

each ACP is summarized in **Table 3-75**. All ACPs are operating at or above 85 percent capacity.

Table 3-75. Vehicle Processing Capacity for JBSA-Randolph ACPs

ACP	Capacity/Processing Hourly Rate (# of vehicles)	Peak Hour Demand (# of vehicles)	Headroom (# of vehicles)
Main Gate	1,500	1,343	157
West Gate	850	743	107
East Gate	1,050	900	150
South Gate	800	680	120

Source: JBSA 2018a

The East Gate lacks a traffic light at the intersection of FM 78 and East 5th Street, which causes routine traffic congestion, and the Union Pacific Railroad, north of FM 78, limits the potential for widening and creating new lanes to accommodate traffic accessing the East Gate. Additionally, the East Gate and South Gate are in the airfield CZs and a MILCON project has been proposed to relocate these gates (JBSA 2018a).

Additional traffic information has been collected by the Texas Department of Transportation, which collects traffic count data for the state of Texas using traffic monitoring software and publishes data on the Traffic Count Database System. **Table 3-76** represents traffic count data for key intersections on which JBSA-Randolph ACPs are located. The data indicate that the Main Gate is the busiest ACP at the installation.

Table 3-76. 2019 Traffic Counts for JBSA-Randolph ACPs

ACP	Traffic Count Location	AADT (2-way)
Main Gate	3rd Street West	17,202
West Gate	Harmon drive	17,233
East Gate	5th Street East	2,984
South Gate	Golf Road	3,026

Source: TxDOT 2019
Notes: AADT= annual average daily traffic

Installation Roadways. JBSA-Randolph is within a well-developed roadway system composed of all levels of roads. The primary roads moving traffic on and off the installation are Harmon Drive, West 3rd Street and East 5th Street, which connect with Main Circle, C Street, F Street, and H Street. All other roads on the installation are connected to these primary roads. A condition of good, fair, or poor has been assigned to all pavement within JBSA-Randolph and is based on a street's condition and presence of curbs/gutters, trees, pedestrians' buffers, planting strips, and sidewalks. Minor roadway segments including a segment west of the West 3rd Street and New West B Street and a segment north of the East 5th Street and New East B street intersection are in poor condition. However, most pavement on the installation, is considered to be in good or fair condition (JBSA 2019b, JBSA 2019c).

Parking. Parking at JBSA-Randolph is provided via 12,231 street and parking lot spaces. The installation is considered to have excessive street parking (JBSA 2018a, JBSA 2019b, JBSA 2019c).

Pedestrian Facilities. The pedestrian network at JBSA-Randolph consists of intermittent concrete sidewalks and crosswalks along primary roadways. Pedestrian facilities along residential streets and minor roadways are uncommon. The JBSA-Randolph Flight Operations and Support Services Area Development Plans outline a district planning vision that includes promoting walkable neighborhoods and campuses, and providing modern, multi-use transportation networks. To achieve the goals of the planning vision and increase connectivity, the existing pedestrian network would need to be improved along with the addition of bicycle and other multifunctional transportation options (JBSA 2019b, JBSA 2019c).

Public Transportation. VIA Metropolitan Transit services the City of San Antonio with bus routes throughout the city and surrounding areas; however, there are no public transit routes with stops in the vicinity of JBSA-Randolph. There is no public rail system within the City of San Antonio. The closest public airport to the installation is the San Antonio International Airport approximately 12 miles northeast of JBSA-Randolph.

3.7.3 Environmental Consequences

Impacts on infrastructure are evaluated based on the degree to which a proposed action would affect the ability for an installation to meet utility demand, or on their potential to disrupt or improve infrastructure service levels and create additional needs. An impact could be considered significant if a proposed action resulted in the exceedance of a utility capacity or created a long-term interruption in the operation of a utility.

Impacts analysis for transportation considers changes to roadway and intersection service levels, and travel patterns and accessibility (i.e., ease of drivers to reach a desired destination). An impact on transportation could be considered significant if a proposed action resulted in substantial decline in roadway service levels; increase in queue times at ACPs; reduction in traffic safety leading to increased risk of vehicular accidents; degradation of existing transportation infrastructure; or substantial and permanent changes to roadway accessibility.

3.7.3.1 Proposed Action

Because MILCON and FSRM projects would occur only at JBSA-Randolph, analysis of impacts on infrastructure and transportation at JBSA-Lackland and Seguin AAF is limited to airfield pavements.

Infrastructure

It is assumed construction contractors would determine and avoid utility locations prior to any ground-disturbing activities that would result in unintended utility disruptions or safety hazards. All construction activity would be conducted in accordance with federal and state safety guidelines. All permits required for excavation and trenching would be obtained prior to the commencement of construction activities.

Airfield Pavements. Short-term, minor, adverse impacts on the airfield pavement at JBSA-Randolph would be expected from the MILCON project to construct 65 T-7A sunshades within the airfield. Construction of the shelters would be phased to maximize the availability of apron and ramp space so that airfield operations would not be interrupted, and sufficient aircraft parking would remain available.

Long-term, minor, adverse impacts on the airfield pavements at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would occur under the Proposed Action because increases in airfield operations during the aircraft transition period would increase airfield pavement deterioration rate. Any increase in aircraft operations at JBSA-Randolph, JBSA-Lackland, or Seguin AAF would result in increased airfield traffic and may decrease the average PCI for those airfields. The increase in airfield operations also could increase the deterioration rate of the airfield pavement when the number of aircraft operations is at its peak and following the transition period. However, the airfield pavement at JBSA-Randolph, JBSA-Lackland, and Seguin AAF are considered to be in good condition. In addition, a net decrease in total annual T-38C and T-7A aircraft operations at Seguin AAF would occur following the aircraft transition period, which could reduce airfield pavement impacts at the installation.

Long-term, minor, beneficial impacts on the airfield pavement at JBSA-Randolph may occur from the addition of aircraft shelters and sunshades, which would include the addition of lighting, and removal/repainting of taxi lines. The new sunshades would increase the aircraft parking capacity at the installation.

Liquid Fuel. Short-term, minor, adverse impacts on the liquid fuel supply and distribution system at JBSA-Randolph would occur through the consumption of fuels during construction and demolition activities associated with the MILCON and FSRM projects under the Proposed Action. If installation-based fuels are used by construction personnel, it is anticipated that the fuel supply would be sufficient to accommodate increased demand.

Long-term, negligible, adverse impacts on the jet A fuel supply at JBSA-Randolph would be expected under the Proposed Action. The T-38C and T-7A transition period would result in increased annual airfield operations at JBSA-Randolph that would require additional jet A fuel quantities when compared with the existing demand. However, JBSA-Randolph is anticipated to have sufficient storage and delivery capabilities to accommodate additional fuel demand.

Communications System. Short- and long-term, negligible, adverse impacts on the communications system at JBSA-Randolph would be expected from MILCON and FSRM project under the Proposed Action. Disruptions in communications services could occur as new facilities are connected to the existing communications system, such as for the MTS facility, GBTS facility, Hush House facility, Fuel Cell facility, and T-7A egress facility MILCON projects; or as facilities undergoing renovations are disconnected and reconnected to the existing communications system, such as for the FSRM projects.

Long-term, minor, beneficial impacts would occur from the addition of new, upgraded communications systems as part of new facility MILCON projects, which would contribute to the overall communications system capacity at JBSA-Randolph.

Electrical System. Short-term electrical disruption could occur while buildings are disconnected from or connected to the JBSA-Randolph electrical distribution system during demolition, construction, or renovation. However, any electrical disruptions would be temporary and coordinated with area users prior to disconnection. Electrical service interruptions could be experienced if underground electrical lines are required to be rerouted; when new facilities are connected to the installation's electrical distribution system, such as the MTS facility, the GBTS facility, the Hush House facility, the Fuel Cell facility, and T-7A egress facility; or when facilities need to be connected to or disconnected from the installation's electrical system during renovation activities, such as for the FSRM projects.

Long-term, negligible, adverse impacts on electrical supply would be expected following the completion of the MILCON and FSRM projects. Permanent new facilities such as the MTS facility, the GBTS facility, the Hush House facility, the Fuel Cell facility, and the T-7A egress facility would require electricity, which would increase the overall energy use at JBSA-Randolph. Slight increases in the electrical power usage at JBSA-Randolph would occur from the influx of personnel onto the installation and into the surrounding communities, and from the new expanded facilities and additional infrastructure.

To conservatively estimate the increased electrical use of the Proposed Action, the residential electrical use associated with personnel and their dependents that would be permanently stationed at JBSA-Randolph was calculated. According to the U.S. Energy Information Administration, the average monthly residential consumption of energy for customers in Texas was 1,140 kilowatt hours (1.14 megawatt hours [MWh]) in 2019. The average monthly commercial consumption of energy was 7,699 kilowatt hours (7.699 MWh) per customer. Texas had 11,366,639 residential energy customers and 1,537,111 commercial energy customers in 2019 (EIA 2020a, EIA 2020b). This information was used to calculate a yearly energy use of approximately 13.6 MWh per household per year. Using that number as a residential planning factor, the additional 303 personnel and their dependents at JBSA-Randolph would increase the state's annual electricity demand by approximately 4,145 MWh. This represents an increase of less than one percent of total state usage in 2019. Assuming the additional personnel would reside at JBSA-Randolph and each additional household uses electricity at the 2019 state rate, the Proposed Action would increase the daily use of electricity at the installation by approximately 11.5 MWh per day (less than 0.5 MW). The increased energy consumption would have a negligible effect on the installation's energy supply capacity of 21 MW.

Water Supply System. Short-term, negligible, adverse impacts on the water supply system at JBSA-Randolph would be expected from the Proposed Action. Short-term water supply and distribution system interruptions could be experienced when new facilities, such as the MTS facility, the GBTS facility, the Hush House facility, the Fuel Cell facility, and the T-7 egress facility are connected to the system, or when facilities need to be connected to or disconnected from the installation's water supply system during renovation activities, such as for the FSRM projects. Any potential disruptions would be temporary and coordinated with area users prior to beginning demolition, construction, or renovation activities. Water necessary for construction would be obtained from the existing water supply system and would have a negligible effect on the installation's overall water supply capacity.

Long-term, negligible, adverse impacts on the water supply system at JBSA-Randolph would occur from the personnel increase associated with the Proposed Action. According to the Texas Water Development Board, the domestic water consumption per household for the State of Texas in 2015 was 246 gpd. The commercial water consumption rate per connection was 1,695 gpd and the industrial water consumption rate per connection was 181,548 gpd (TWDB 2015). To estimate potential increases in potable water demand, it was assumed all 303 new personnel and their dependents would be residing on the installation and each additional household would use water at the 2015 state rate. Therefore, the Proposed Action would increase the average daily water demand at JBSA-Randolph by 74,538 gpd from 540,700 gpd to 615,238 gpd, an increase of approximately 14 percent. The new total daily water use would represent approximately 22 percent of the maximum supply capacity of 2,831,000 gpd at JBSA-Randolph. Water demand could also increase from potential increases in firefighting demand during the aircraft transition period; however, JBSA-Randolph would have sufficient supply capacity to accommodate additional demand. Therefore, the water supply system would be sufficient to support the new residential demand and any other long-term water supply requirements from the MILCON and FSRM projects. Impacts on the groundwater aquifer that supplies potable water are discussed in **Section 3.9**.

Wastewater System. Short-term, negligible, adverse impacts on the wastewater system at JBSA-Randolph could occur while buildings are disconnected from or connected to the wastewater system during MILCON and FSRM projects. However, disruptions would be temporary and coordinated with area users prior to demolition, construction or renovation activities.

Long-term, moderate, adverse impacts on the wastewater system would occur from the personnel increase associated with the Proposed Action. A planning factor of 20 gpd per person, in accordance with 30 Texas Administrative Code § 217.32(a)(3) for an office building or factory, was used to estimate wastewater discharges from additional personnel. Based on the anticipated increase of 303 personnel at JBSA-Randolph, the Proposed Action would increase wastewater discharge from the installation by 6,060 gpd, an approximate 2.5 percent increase from the 2020 average daily discharge. The new daily wastewater discharge would be 252,605 gpd, which is less than the discharge capacity of 281,348 gpd. In addition, industrial wastewater discharges from the new facilities under the MILCON projects and increased maintenance operations from additional aircraft during the transition period could further increase wastewater discharge. However, increased wastewater discharge from the Proposed Action is not expected to exceed discharge capacity. The Proposed Action would not affect maintenance and replacement of wastewater lines at JBSA-Randolph or other ongoing system upgrades.

Stormwater System. Short-term, negligible, adverse impacts on the stormwater system at JBSA-Randolph would be expected from the MILCON and FSRM projects. Construction activities, and the associated laydown areas, could potentially inhibit stormwater from reaching existing inlets or streams, or could create slicker surfaces for higher velocity stormwater flows. Adverse effects would be minimized through the implementation of BMPs, which could include installing temporary stormwater controls (e.g., retention basins, silt fences, straw bales, and swales) to minimize the volume and velocity of stormwater flow. An update to JBSA-Randolph's

Stormwater Pollution Prevention Plan (SWPPP) could be required, and the requirements of the Energy Independence and Security Act would be followed to maintain or restore, to the maximum extent practicable, the predevelopment hydrology of the collective project sites with respect to rate, volume, and duration of flow. In addition to applicable BMPs, guidance for maintaining and restoring areas of development provided in the SWPPP would be followed to minimize or eliminate impacts.

Long-term, negligible, adverse, impacts on the stormwater system at JBSA-Randolph would occur following the completion of the MILCON projects, which would result in an increase of 104,600 ft^2 (2.4 acres) of impervious surfaces at the installation. The increase of impervious areas could increase stormwater runoff near the MTS facility, GBTS facility, Hush House pad, and Fuel Cell facility. To meet the performance objectives of the Energy Independence and Security Act, technically feasible stormwater control design features and practices that are effective in reducing the volume of stormwater runoff would be incorporated, to the extent practicable, into the design of the facilities. Design strategies, such as use of green infrastructure, and low impact development (e.g., use of porous pavements and bio-retention areas), would also be considered to facilitate evapotranspiration and capture stormwater runoff. Low impact development and other long-term stormwater management features would require continued maintenance, which would be addressed in the installation's stormwater management plan. It is not likely that impacts on the stormwater system would result from implementation of the FSRM projects.

Adverse effects could be minimized through the implementation of BMPs, which would include installing temporary stormwater controls to minimize the volume and velocity of stormwater flow. Federally required design principles such as UFC 1-200-02, High Performance and Sustainable Building Requirements; UFC 3-210-10, Low Impact Development; and Section 438 of the Energy Independence and Security Act require project sites to maintain or restore disturbed sites to pre-construction hydrologic conditions.

Natural Gas System. Short-term, negligible, adverse impacts on the natural gas distribution system at JBSA-Randolph may occur from the MILCON and FSRM projects under the Proposed Action. Temporary interruptions in natural gas supply could occur when buildings are disconnected from or connected to the natural gas distribution system during demolition, construction, and renovation activities. However, disruptions would be temporary and coordinated with area users beforehand.

No long-term, adverse effects would occur because it is not anticipated that any new or renovated facilities would require a natural gas supply beyond the distribution capacity at JBSA-Randolph. JBSA-Randolph is operating well below the natural gas supply capacity; therefore, in the event that new facilities would require natural gas connections, the increased natural gas demand would not exceed the supply capacity.

Solid Waste Management. Short-term, minor, adverse impacts on solid waste management at JBSA-Randolph would be expected from the creation of demolition and construction debris. Solid waste generated from the MILCON and FSRM projects would consist of building materials such as solid pieces of concrete, metals (e.g., conduit, piping, and wiring), lumber, cement, and asphalt. To maximize landfill diversion rates, contractors would be required to recycle

construction and demolition debris in accordance with applicable federal and installation policies. The contractor would be responsible for disposing non-recyclable debris at permitted waste facilities such as the Covel Gardens Landfill, which would have a short-term, negligible, adverse impact on solid waste management by permanently reducing landfill capacity.

Long-term, negligible, adverse impacts on solid waste management at JBSA-Randolph from waste generated by the 303 new personnel and their dependents. USEPA estimates the average person generates 4.9 pounds of municipal solid waste per day (USEPA 2018). Based on USEPA municipal waste estimates and the anticipated increase of 303 personnel, the Proposed Action would increase municipal waste at JBSA-Randolph by approximately 1,485 pounds, or approximately 0.74 tons, per year. This represents less than 0.01 percent of non-hazardous waste produced at JBSA-Randolph in Fiscal Year 2012. To reduce adverse impacts, JBSA-Randolph would continue to implement a mandatory recycling program and divert waste from landfills through reuse and recycling.

Heating/Cooling System. Short-term, negligible adverse impacts on the heating and cooling system at JBSA-Randolph would be expected from the MILCON and FSRM projects under the Proposed Action. Temporary interruptions in delivery of chilled-water and heat could occur when buildings are disconnected from or connected to the chilled-water plant and boilers during demolition, construction, and renovation activities. However, disruptions would be temporary and coordinated with area users beforehand.

Long-term, negligible, adverse impacts may occur from the increased heating and cooling demand from operations of new facilities. New boilers may need to be constructed at the proposed new facilities to accommodate heating requirements. To accommodate cooling demand, new facilities would be connected to one or more of the existing chilled-water plants on the installation. It is not anticipated that increased demand heating or cooling demand would exceed the supply capacity at JBSA-Randolph.

Transportation

Regional Roadways. Short-term, negligible, adverse impacts on the regional transportation and roadway network would occur during facility construction, demolition, and renovation for the MILCON and FSRM projects. These activities would require the delivery of materials to construction and renovation sites at the installation. All construction traffic, including equipment and material deliveries, and commuting work crews would enter JBSA-Randolph through the Main Gate on Harmon Drive, or the South Gate on Golf Road. No demolition, construction, or renovation activities would occur beyond the installation perimeter; therefore, impacts to regional roadways would likely be traffic-related only. Increased traffic on roadways used to access the installation gates, such as FM 78 north of the installation or Lower Seguin Road south of the installation, would likely result from the daily commutes of contractors and construction crews, delivery of materials, and removal of construction debris. However, the increase in regional traffic would have a negligible effect and would not impact or degrade the LOS of regional roadways.

Long-term, negligible, adverse impacts on regional roadways near the Main Gate could occur from additional personnel commuting to and from the installation daily; however, the increase in

traffic would likely not permanently affect or degrade the LOS regional roadways beyond normal deterioration.

Gate Access. Short-term, minor, adverse impacts on gates at JBSA-Randolph would occur from implementation of the MILCON and FSRM projects. Additional construction traffic including daily commutes from workers and material hauling would increase the daily number of vehicles accessing the installation. It is assumed that construction personnel would commute daily to JBSA-Randolph from off-installation. Contractors and construction crews would likely access the installation using the Main Gate, and all commercial vehicles would be required to use the South Gate. The greatest congestion at the installation gates would occur during peak travel time, typically 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. The level of impact on traffic volumes would be dependent on construction vehicle routes from the Main Gate and the South Gate, frequency of travel, peak times for construction vehicle activity, and length of the construction period. Because the MILCON projects are within the eastern portion of the installation, construction traffic for those projects would be concentrated in the eastern and southern installation areas. Construction traffic would compose a small percentage of the total traffic volume accessing the installation daily when compared with existing conditions. Some heavy equipment such as dozers, loaders, and graders would be left at the construction site or staging area during the duration of the construction period and would not contribute to the vehicles accessing the installation on a daily basis. Traffic pattern changes and detours due to the Proposed Action would be communicated to installation personnel via electronic signs, bulletins, and memos. Additional construction traffic at the JBSA-Randolph gates would cease once construction activities are completed.

Long-term, minor, adverse impacts on gate access and processing rates would occur from the addition of 303 personnel at JBSA-Randolph. Personnel living off-installation would commute daily to the installation and would likely access the installation through the Main Gate. Personnel living on the installation would not be anticipated to affect gate traffic or processing rates during peak travel times. The capacity of the Main Gate is 1,500 vehicles per hour, while the peak hour demand is 1,343 vehicles per hour. In the case that all 303 additional personnel would live off-installation and commute daily through the Main Gate at JBSA-Randolph, additional traffic would represent approximately 20 percent of the Main Gate capacity. Although most additional traffic would enter and exit the installation during peak travel times, it is likely that some personnel would maintain adjusted working hours and access the Main Gate during slow travel times. Additionally, some personnel may use other gates such as the East Gate or the West Gate to access JBSA-Randolph, which would decrease the potential for congestion at the Main Gate.

Installation Roadways. Short-term, minor, adverse impacts on the installation transportation network and roadways would be expected from demolition, construction, and renovation activities associated with the MILCON and FSRM projects. Contractors and construction crews would access construction sites daily using the on-installation road network. Construction traffic would also include delivery of materials and removal of debris from project sites. Location of increased traffic would be concentrated in the eastern portion of the installation as that is where the MILCON projects would occur. Construction traffic would compose a small percentage of the total traffic on the installation and many of the construction vehicles would remain within a

project site for the duration of the construction period, which would minimize impacts on installation roadways. Any potential increases in traffic volumes associated with the construction and renovation activities would be temporary, and partial or full road closures, traffic pattern changes, and detours would be communicated to installation personnel via electronic signs, bulletins, and memos.

Parking. Long-term, minor, beneficial impacts on parking at JBSA-Randolph would result from the addition of nearly 100 parking spaces for the MTS and GBTS facilities and 5 parking spaces for the Fuel Cell Facility. The installation is considered to have excess parking, and additional personnel would not affect the parking capacity at JBSA-Randolph.

Pedestrian Facilities. No impacts on pedestrian facilities would occur from implementation of the Proposed Action.

Public Transportation. Because there are no public transportation networks in the vicinity of the MILCON or FSRM projects at JBSA-Randolph, no impacts on public transportation would occur.

3.7.3.1.1 Alternative 1

The initiation of the T-7A recapitalization program at lower intensity than the Proposed Action would result in an increase in total (daytime and nighttime) airfield operations at JBSA-Randolph, JBSA-Lackland, and Seguin AAF during the aircraft transition period slightly lower than for the Proposed Action. Because the operation tempo of T-38C and T-7A would be less than that of the Proposed Action, Alternative 1 would result in short-term, adverse impacts on airfield pavement that would be slightly less than that of the Proposed Action. Any increase in aircraft operations at the three airfields would result in increased airfield traffic and may decrease the average PCI for airfield pavement. Increased airfield operations also may increase the pavement deterioration rate; however, the airfields at JBSA-Randolph, JBSA-Lackland, and Seguin AAF are considered to be in good condition and are not anticipated to be affected by long-term T-7A operations.

Long-term aircraft operations following the aircraft transition period (2032 and later) under Alternative 1 would result in a net decrease of total T-38C and T-7A aircraft operations at JBSA-Randolph and Seguin AAF, which could reduce airfield pavement impacts (i.e., pavement deterioration rates) at those installations, which would result in long-term, negligible, beneficial impact on airfield pavements. In addition, liquid fuels would be consumed at a lower rate than for the Proposed Action; therefore, long-term, negligible, adverse impacts on liquid fuels would be slightly less than those for the Proposed Action.

Under Alternative 1, the GBTS Facility would be sited identically as the Proposed Action but include six large bays instead of eight; however, the building size and footprint would remain the same as the Proposed Action. Therefore, impacts on infrastructure and transportation from construction of the GBTS Facility would be identical to those under the Proposed Action. In addition, only 52 T-7A shelters would be constructed within the airfield under Alternative 1, which is 10 fewer than the 65 T-7A shelters under the Proposed Action. Therefore, impacts on infrastructure and transportation from T-7A shelter construction would be slightly less than those of the Proposed Action. The T-7A egress addition to Building 38 would be reduced under

Alternative 1 but would result in a negligible difference in impacts than those of the Proposed Action.

3.7.3.1.2 Alternative 2

Under Alternative 2, which would result in T-7A operations at an intensity 15 percent greater than the Proposed Action, impacts on infrastructure related to airfield and flight operations (i.e., airfields and fuels) would be slightly greater than those described for the Proposed Action. Total aircraft operations at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would be highest during the aircraft transition period, and long-term aircraft operations following the aircraft transition period (2032 and later) would result in a net increase of aircraft operations at the three airfields. The additional aircraft operations would increase airfield traffic at JBSA-Randolph, JBSA-Lackland, and Seguin AAF and may increase pavement deterioration and decrease the average PCI at a rate greater than that described for the Proposed Action; however, the airfields at JBSA-Randolph, JBSA-Lackland, Seguin AAF are considered to be in good condition and are not anticipated to be affected by long-term T-7A operations under Alternative 2. The increase in aircraft operations would also require additional quantities of Jet A fuel greater than requirements for the Proposed Action, however, JBSA-Randolph has sufficient delivery and storage capacity to accommodate the increased requirement.

Under Alternative 2, the MILCON and FSRM projects would be identical to those for the Proposed Action; therefore, impacts on infrastructure and transportation from demolition, construction, and renovation activities would be identical to those for the Proposed Action.

3.7.3.1.3 Alternative 3

Under Alternative 3, which would result in T-7A operations at an intensity 25 percent greater than the Proposed Action, impacts on infrastructure related to airfield and flight operations (i.e., airfield pavement and fuels) would be slightly greater than those described for Alternative 2. Total aircraft operations at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would be highest during the aircraft transition period and a net increase of aircraft operations at the three airfields would result from long-term aircraft operations following the aircraft transition period (2032 and later). The increased aircraft operations would increase airfield traffic at JBSA-Randolph, JBSA-Lackland, and Seguin AAF and may increase pavement deterioration and decrease the average PCI at a rate greater than that described for the Alternative 2; however, the airfields at JBSA-Randolph, JBSA-Lackland, Seguin AAF are considered to be in good condition and are not anticipated to be affected by long-term T-7A operations under Alternative 3. The increase in aircraft operations would also require additional quantities of Jet A fuel greater than requirements for Alternative 2, however, JBSA-Randolph has sufficient delivery and storage capacity to accommodate the increased requirement.

Under Alternative 3, the MILCON and FSRM projects would be identical to those for the Proposed Action; therefore, impacts on infrastructure and transportation from demolition, construction, and renovation activities would be identical to those for the Proposed Action.

3.7.3.2 No Action Alternative

Under the No Action Alternative, DAF's T-7A recapitalization program would not be initiated at JBSA and no MILCON or FSRM projects would be implemented. Additionally, there would be

no changed in aircraft operations or installation utility demand. Therefore, no impacts on infrastructure or transportation at JBSA-Randolph, JBSA-Lackland, or Seguin AAF, or within the region would occur.

3.8 Safety

3.8.1 Definition of the Resource

Safety addresses the well-being, safety, and health of members of the public, contractors, and DAF personnel during the various aspects of the Proposed Action and alternatives. A safe environment is one in which there is no, or an optimally reduced, potential for serious bodily injury or illness, death, or property damage. Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazards relevant to this Proposed Action and alternatives include construction, mission, and flight activities.

3.8.2 Affected Environment

Construction Safety. All contractors performing construction activities on DAF installations, including JBSA-Randolph, are responsible for following federal OSHA regulations and are required to conduct these activities in a manner that does not increase risk to workers or the public. OSHA regulations address the health and safety of people at work and cover potential exposure to a range of chemical, physical, and biological hazards, and ergonomic stressors. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, use of PPE, and availability of Safety Data Sheets.

Construction contractors are responsible for reviewing potentially hazardous workplace conditions; monitoring worker exposure to workplace chemical (e.g., asbestos, Pb, hazardous substances), physical (e.g., noise propagation, falls), and biological (e.g., infectious waste, wildlife, poisonous plants) agents, and ergonomic stressors; and recommending and evaluating controls (e.g., prevention, administrative, engineering, PPE) to ensure exposure to personnel is eliminated or adequately controlled. Additionally, employers are responsible for ensuring a medical surveillance program is in place to perform occupational health physicals for those workers subject to the use of respiratory protection, engaged in hazardous waste work, asbestos, Pb, or other work requiring medical monitoring.

Mission Safety. Mission safety on DAF installations is maintained through adherence to DoD and DAF safety policies and plans. DAF safety program ensures the safety of personnel and the public on the installation by regulating mission activities. AFI 91-202, *The DAF Mishap Prevention Program*, implements Air Force Policy Directive 91-2, *Safety Programs*, and provides guidance for implementing the safety program on all activities that occur on DAF installations.

JBSA is a secure military installation where access is limited to military personnel, civilian employees, military dependents, and approved visitors. Aircraft operations and maintenance

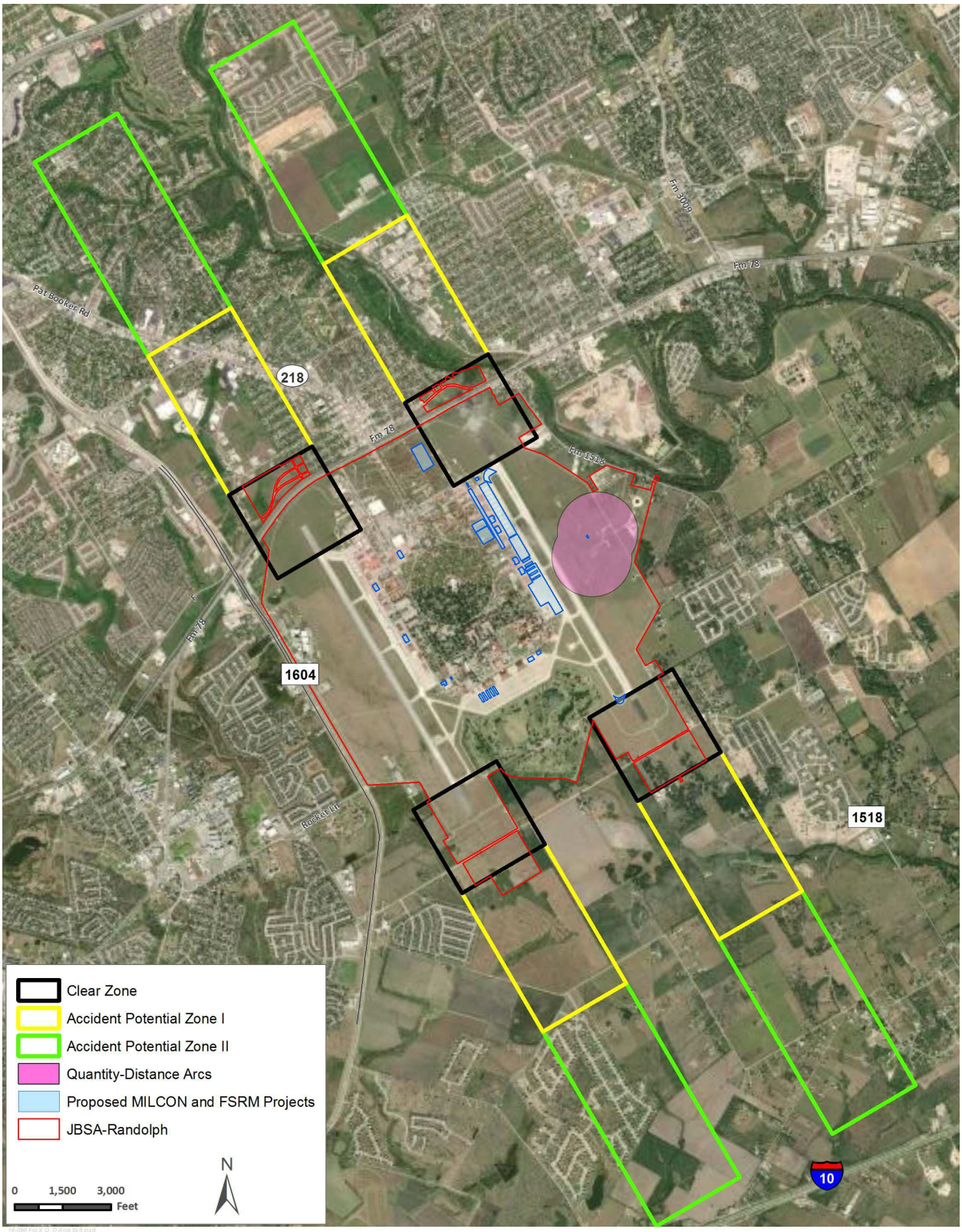
activities performed on JBSA, including those currently done for the T-38C, are accomplished in accordance with applicable DAF safety regulations, published DAF Technical Orders, and standards prescribed by DAF occupational safety and health requirements. Adherence to industrial-type safety procedures and directives ensures safe working conditions.

Q-D arcs are buffers around facilities that contain high-explosive munitions or flammable elements. The size and shape of a Q-D arc depends on the facility and the net explosive weight of the munitions being housed. Separations set by Q-D arcs establish the minimum distances necessary to prevent the exposure of DAF personnel and the public to potential explosive safety hazards. Two Q-D arcs cover a tract of land east of Runway 15L/33R and surrounding the ammunition storage area on JBSA-Randolph (see **Figure 3-28**).

Flight Safety. The primary safety concern regarding military flights is the potential for aircraft mishaps (i.e., crashes or crash landings), including those caused by adverse weather events and bird and bat aircraft strikes. Aircraft mishaps are classified as A, B, C, or D. Class A mishaps are the most severe with total property damage of $2 million or more or a fatality or permanent total disability. Wildlife strikes are a flight safety concern due to the potential damage that a strike might have on the aircraft or injury to aircrews. AFI 91-202 establishes mishap prevention program requirements (including those for BASH), assigns responsibilities for program elements, and contains program management information.

Restrictions on land uses are intended to protect the public from exposure to aircraft operations hazards. The AICUZ program is used to protect public and DAF personnel health and safety, as it relates to aircraft noise, accident potential, and the intersection with land use. Each DAF installation's AICUZ study identifies CZs and APZs to protect the public from aircraft mishaps and noise zones to protect from aircraft noise. DAF policy requires privately owned land located within CZs to be acquired by DAF via a fee simple easement or a restrictive land easement. APZs identify areas and restrict land use where the greatest potential for aircraft accidents exist.

JBSA-Randolph. The CZs for JBSA-Randolph's runways are each 3,000 feet long and 3,000 feet wide (1,500 feet on either side of runway centerline). They extend beyond the installation boundary and include properties in Universal City and the City of Schertz to the north and the cities of Converse and Schertz to the south (see **Figure 3-28**). The CZs were originally 3,000 feet long and 2,000 feet wide; however, they were amended in 2015 to follow AFI 32-7063 (since replaced by AFI 32-1015) and UFC 3-260-01. CZ easements have not been fully established, and the increased area of the CZs has resulted in incompatible land uses. The CZs at JBSA-Randolph cover a total of 167 acres of land off the installation. Approximately 80 acres are rural/undeveloped, 40 acres are residential development, 32 acres are commercial development, and 3 acres are farm and ranch land. Public roadways and other types of land uses compose the remainder of the CZs (DAF 2017a).



Data Sources: JBSA-Randolph GIS and Imagery (Esri 2015).

Figure 3-28. Q-D Arcs, CZs, and APZs at JBSA-Randolph

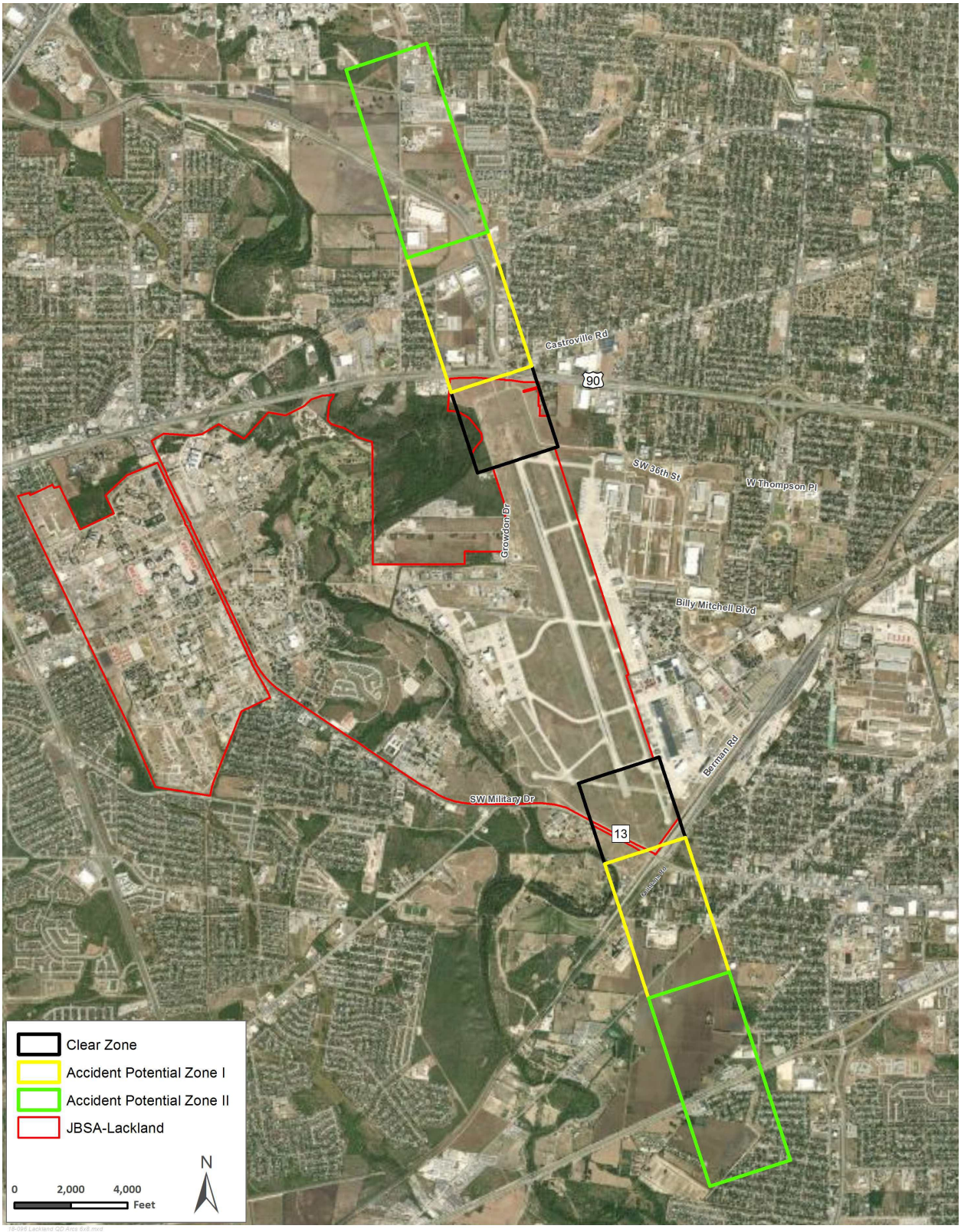
Both runways at JBSA-Randolph have APZs (see **Figure 3-28**). APZ I measures 5,000 feet from the CZ and is 3,000 feet wide. APZ II measures 7,000 feet from APZ I and is 3,000 feet wide. APZ I for JBSA-Randolph's runways covers a total of 1,377 acres and APZ II covers a total of 1,928 acres of off-installation land. Off-installation land consists of approximately 759 acres of rural/undeveloped, 159 acres of residential development, 231 acres of commercial development, and 9 acres of farm and ranch land within APZ I and approximately 1,044 acres of rural/undeveloped, 561 acres of residential development, 41 acres of commercial development, and 70 acres of farm and ranch land within APZ II. Public roadways and other types of land uses compose the remainder of the APZs (DAF 2017a).

Since 1988, JBSA-Randolph has owned restrictive easements around Runway 15R/33L, within Universal City, to control development and land use that may be incompatible with military activities. To protect the public and ensure continued viability of JBSA-Randolph, the City of Schertz implemented zone regulations within the JBSA-Randolph AICUZ noise zones and APZs. The City of Converse has a zone overlay district regulating building heights, solar development, and sound attenuation requirements for new construction within 1.5 miles of the JBSA-Randolph runways. The city's land use regulations restrict development of vacant land within the CZs (DAF 2017a).

JBSA-Lackland. The CZs for JBSA-Lackland's runway measure 3,000 feet long and 3,000 feet wide (1,500 feet on either side of the runway centerline). Small portions of the CZs extend beyond the installation boundary and include private property and the U.S. Highway 90 right-of-way to the north and Union Pacific Railroad Company right-of-way to the south (see **Figure 3-29**). The CZs cover a total of 33 acres off the installation. Approximately 8 acres occur in industrial development, 0.2 acres occur in residential development, and public roadways and other land uses compose the remainder of the CZs. The northern CZ for Runway 16 overlaps residential structures along Garner Road. The U.S. Government purchased the residential parcels; however, the structures still pose a compatibility concern within the CZ (DAF 2019).

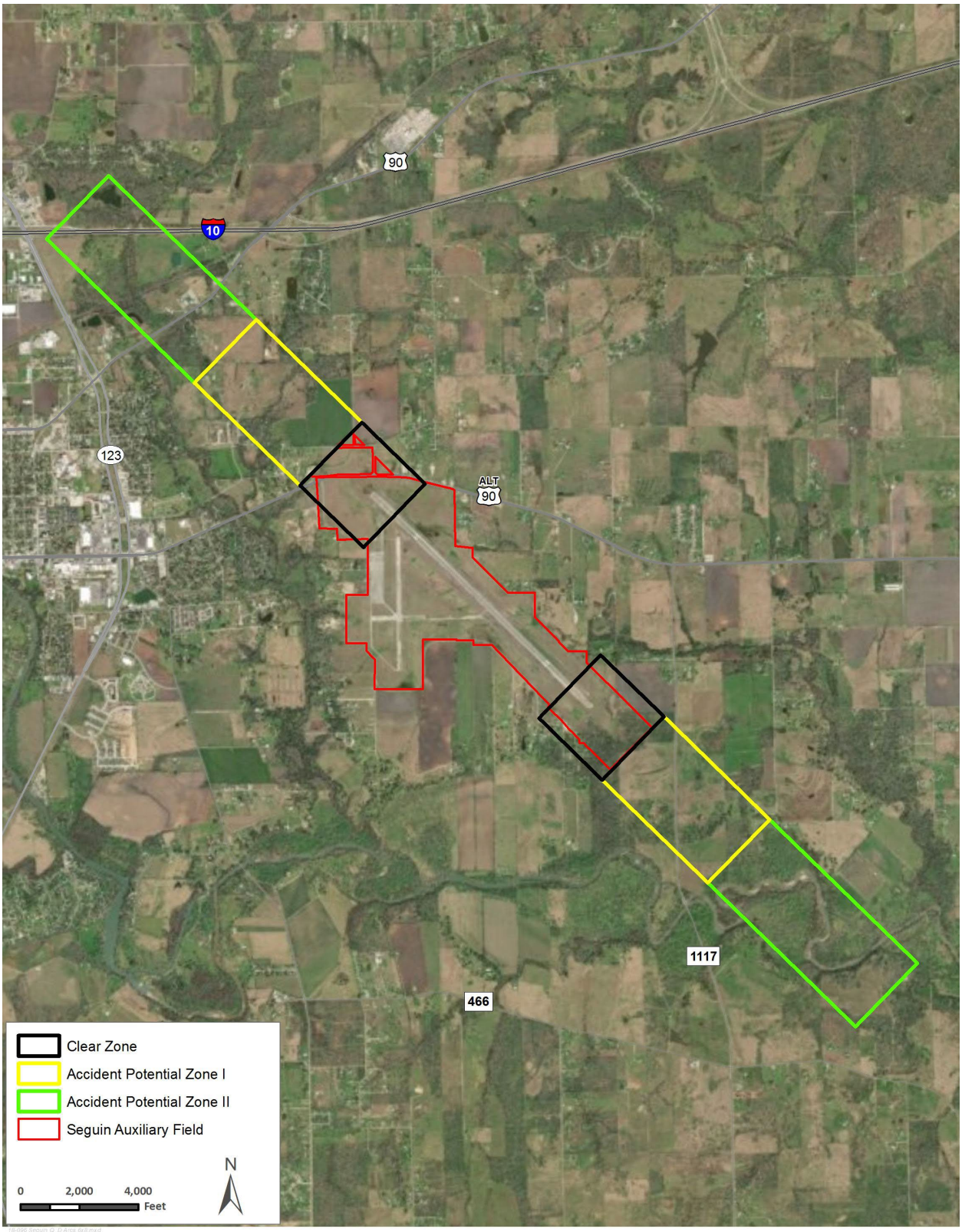
The runway for JBSA-Lackland has APZs at each end (see **Figure 3-29**). APZ I measures 5,000 feet from the CZ and is 3,000 feet wide. APZ II measures 7,000 feet from APZ I and is 3,000 feet wide. APZ I covers 645 acres and APZ II covers 962 acres of off-installation land. Off-installation land consists of approximately 332 acres of industrial development, 93 acres of commercial development, and 15 acres of residential development within APZ I and approximately 521 acres of industrial development, 236 acres of commercial development, 100 acres of residential development, and 2 acres of agricultural land within APZ II. Public roadways and other land uses compose the remainder of the APZs (DAF 2019).

Seguin AAF. The CZs for Seguin AAF's runway measure 3,000 feet long and 3,000 feet wide (1,500 feet on either side of runway centerline) (see **Figure 3-30**). The CZs cover a total of 115 acres of land off the installation. Approximately 54 acres are rural/undeveloped, 16 acres are residential development, 8 acres are commercial development, and 18 acres are farm and ranch land. Public roadways and other types of land uses compose the remainder of the CZs (DAF 2017a).



Data Sources: JBSA-Randolph GIS and Imagery (Esri 2015).

Figure 3-29. CZs and APZs at JBSA-Lackland



Data Sources: Seguin GIS and Imagery (Esri 2015).

Figure 3-30. CZs and APZs at Seguin AAF

The runway for Seguin AAF has APZs at each end (see **Figure 3-30**). APZ I measures 5,000 feet from the CZ and is 3,000 feet wide. APZ II measures 7,000 feet from APZ I and is 3,000 feet wide. APZ I covers a total of 689 acres and APZ II covers a total of 964 acres of off-installation land. Off-installation land consists of approximately 389 acres of rural/undeveloped, 38 acres of residential development, 3 acres of commercial development, and 175 acres of farm and ranch land within APZ I and approximately 451 acres of rural/undeveloped, 18 acres of residential development, 14 acres of commercial development, and 305 acres of farm and ranch land within APZ II. Public roadways and other types of land uses compose the remainder of the APZs (DAF 2017a).

DAF has not acquired easements to prevent incompatible development near the runway for Seguin AAF. The City of Seguin is pursuing adoption of an overlay district for Seguin AAF that would include regulations for development review notification, height limitation, density control, and lighting for future development (DAF 2017a).

Twelve Class A aircraft mishaps have occurred on or near JBSA-Randolph. Two occurred in 1933 with PT-3 aircraft, one occurred in 1945 with a TB-29A aircraft, two occurred in 1951 with B-29 aircraft, two occurred in 1955 with B-57C and B-29 aircraft, two occurred in 1956 with B-29 and B-57B aircraft, one occurred in 1974 with a T-38A aircraft, one occurred in 1995 with a T-3A aircraft, and one occurred in 2003 with a T-38A aircraft. BASH was the cause of the T-38A mishap in 1974, which resulted in one fatality. The T-38A mishap in 2003 was caused by tire failure that caused a barrier stanchion to breach the front of the cockpit and cause the involuntary ejection of one pilot. One fatality occurred during this mishap. Four Class A aircraft mishaps have occurred on or near JBSA-Lackland. One occurred in 1934 with a P-1C aircraft, one occurred in 1939 with a BC-1 aircraft, one occurred in 1940 with an AT-6 aircraft, and one occurred in 1941 with an AT-6A aircraft. One Class A aircraft mishap occurred on or near Seguin AAF in 1950 with a B-29A aircraft (ASN 2021).

3.8.3 Environmental Consequences

Any increase in safety risks is considered an adverse impact on safety. Significant impacts on safety would occur if a proposed action does either of the following:

- Substantially increase risks associated with the safety of DAF personnel or the general public.
- Introduce a new safety risk for which DAF is not prepared or does not have adequate management and response plans in place.

3.8.3.1 Proposed Action

Construction Safety. Short-term, minor, adverse impacts on contractor health and safety would occur during construction for the MILCON and FSRM projects. Construction activities are inherently hazardous because personnel potentially are exposed to health and safety hazards from heavy equipment operation; hazardous materials and chemical use; and working in confined, poorly ventilated, and noisy environments. Therefore, contractors performing construction work would be exposed to an environment containing slightly greater health and safety risks than a non-construction environment.

To minimize health and safety risks, construction contractors would be required to use appropriate PPE and establish and maintain site-specific health and safety programs for their employees. Contractor health and safety programs would follow all applicable federal OSHA regulations and would be reviewed by JBSA-Randolph personnel prior to work beginning to ensure that appropriate measures are taken to reduce the potential exposure of workers and installation personnel to health and safety risks. Safety Data Sheets for all hazardous materials and chemicals stored at the worksite would be kept on site and be available for immediate review.

Construction contractors would work within the existing Q-D arcs of JBSA-Randolph's ammunition storage area to construct the proposed munition storage facility. Depending on the type of ammunition stored at the time of construction, JBSA-Randolph personnel would ensure that appropriate precautions are taken to prevent an inadvertent explosion caused by construction. Such precautions could include prohibiting the loading or transport of explosive material while contractors are present or temporarily storing explosive material at locations farther away from the construction site.

Mission Safety. No adverse impacts on the health and safety of military personnel would occur from the Proposed Action. All mission-related activities associated with the Proposed Action would be carried out in accordance with DoD and DAF safety policies and plans. Aircraft maintenance activities would be accomplished similar to those already performed for the T-38C and in accordance with applicable DAF safety regulations, published DAF Technical Orders, and standards prescribed by DAF occupational safety and health requirements. Adherence to industrial-type safety procedures and directives would ensure safe working conditions.

The proposed munition storage facility that would store ejection seats for the T-7A aircraft would be sited within the existing Q-D arcs covering JBSA-Randolph's ammunition storage area. Siting this facility within a Q-D arc is necessary to ensure the safety of nearby populations from the explosive hazard. JBSA-Randolph would adjust the Q-D arc boundaries, as necessary. None of the other MILCON or FSRM projects would require siting or be sited within a Q-D arc.

Flight Safety. Long-term, negligible, adverse impacts on flight safety would occur from increased aircraft operations during the T-38C to T-7A transition period, at full T-7A implementation, and with the introduction nighttime T-7A operations at JBSA-Randolph and JBSA-Lackland. The proposed operations would result in an increased potential for BASH incidents, including bat strikes, and other mishaps from greater and nighttime airfield use. However, the overall potential for BASH incidents and other mishaps is not expected to be significantly greater than baseline because all flight safety guidelines and regulations currently in place, including the BASH program, would continue to be followed. All aircraft operations would continue to be performed in accordance with standard flight rules and local operating procedures and policies. Aircraft mishaps at JBSA-Randolph, JBSA-Lackland, and Seguin AAF are rare, and T-7A operations would be similar in nature to those currently performed with T-38C aircraft. Therefore, T-7A operations would not be expected to increase the potential occurrence of Class A mishaps. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged.

3.8.3.1.1 Alternative 1

Impacts on safety from fewer T-7A aircraft and T-7A operations that are at a lower intensity than the Proposed Action (beginning in 2027) would be slightly less than those described for the Proposed Action. Compared to the Proposed Action, aircraft operations at a lower intensity would slightly decrease the potential for BASH incidents, including bat strikes, and other mishaps associated with airfield use. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged. Identical impacts on safety would occur from installation of only 52 T-7A shelters (rather than 65 shelters under the Proposed Action), and a different interior design for the GBTS facility, and a smaller addition to Building 38.

3.8.3.1.2 Alternative 2

Impacts on safety from T-7A operations that are 15 percent greater than the Proposed Action would be similar to those described for the Proposed Action. Compared to the Proposed Action, the 15 percent increase in operations would increase the potential for BASH incidents, including bat strikes, and other mishaps from greater and nighttime airfield use. However, the overall potential for BASH incidents and other mishaps is not expected to be significantly greater than the Proposed Action because all safety programs in place for the existing aircraft operations, including the BASH program, would continue to be followed. As a result, the proposed increase in operations would not be expected to increase the potential occurrence of Class A mishaps. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged.

3.8.3.1.3 Alternative 3

Impacts on safety from T-7A operations that are 25 percent greater than the Proposed Action would be similar to those described for the Proposed Action and Alternative 2. Compared to the Proposed Action and Alternative 2, the 25 percent increase in operations would further increase the potential for BASH incidents, including bat strikes, and other mishaps from greater and nighttime airfield use. However, the overall potential for BASH incidents and other mishaps is not expected to be significantly greater than the Proposed Action or Alternative 2 because all safety programs in place for the existing aircraft operations, including the BASH program, would continue to be followed. As a result, the proposed increase in operations would not be expected to increase the potential occurrence of Class A mishaps. The CZs and APZs for JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged.

3.8.3.2 No Action Alternative

The No Action Alternative would not result in impacts on safety. No facility construction would occur, and there would be no changes in aircraft operations. Construction, mission, and flight safety conditions at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged when compared to the existing conditions described in **Section 3.8.2**.

3.9 Water Resources

3.9.1 Definition of the Resource

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. The water resources relevant to this Proposed Action and alternatives are groundwater, surface water, wetlands, and floodplains at JBSA-Randolph. Because the Proposed Action and alternatives would entail only aircraft operations at JBSA-Lackland and Seguin AAF, no impacts on water resources would occur at these installations. As such, a discussion of water resources at JBSA-Lackland and Seguin AAF is unnecessary for this EIS. Likewise, no impacts on water resources beneath the airspace areas would occur; therefore, water resources in the airspace areas are not analyzed further.

Groundwater. Groundwater is water that collects or flows beneath the Earth's surface, filling the porous spaces in soil, sediment, and rocks. A deposit of subsurface water that is large enough to tap via a well is referred to as an aquifer. Groundwater originates from precipitation, percolates through the ground surface, and often is used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface Water. Surface water includes natural, modified, and constructed water confinement and conveyance features above groundwater that may or may not have a defined channel and discernable water flows. These features generally are classified as streams, springs, wetlands, natural and artificial impoundments (e.g., ponds, lakes), and constructed drainage canals and ditches. Stormwater is surface water generated by precipitation events that may percolate into permeable surficial sediments or flow across the top of impervious or saturated surficial areas, which is a condition known as runoff. Stormwater is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Stormwater flows, which can be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to the management of surface water. Stormwater systems reduce sediments and other contaminants that would otherwise flow directly into surface waters.

The Clean Water Act (CWA) (33 USC §1251 et seq., as amended) establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters to restore and maintain the chemical, physical, and biological integrity of the water. An NPDES Construction General Permit would be required for any change in the quality or quantity of stormwater runoff and for some non-stormwater discharges from construction sites where 1 acre or more would be disturbed. The permit mandates use of BMPs to ensure that soil disturbed during construction does not pollute nearby water bodies.

The NPDES stormwater program requires construction site operators engaged in activities that disturb 1 acre or more to obtain coverage under a General Permit for Stormwater Discharge from Large and Small Construction Activities for their stormwater discharges. Construction or demolition that necessitates a permit requires preparation of a Notice of Intent to discharge

stormwater and a SWPPP that is implemented during work activities. The issuance of stormwater NPDES permits is completed by either a USEPA regional office or a state regulatory office depending on which organization has primacy. In the State of Texas, TCEQ has primacy over DAF installations. The construction contractor would apply for a Texas Construction General Permit in the short-term, under which the construction activities would be covered. Upon completion of construction, an industrial (MSGP) and a municipal (MS4) general stormwater permit would govern the long-term control of pollutants in stormwater on the installation (TCEQ 2021).

Section 438 of the Energy Independence and Security Act (EISA) (42 USC § 17094) establishes stormwater design requirements for federal construction projects that disturb a footprint greater than 5,000 ft^2. Additional guidance is provided in the USEPA *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the EISA*. UFC 3-210-10, *Low Impact Development*, also provides technical criteria, technical requirements, and references for the planning and design of applicable DoD projects to comply with stormwater requirements under Section 438 of EISA. Per these requirements, any increase in surface water runoff as a result of construction would be attenuated using temporary and/or permanent drainage management features. The integration of low impact development design concepts incorporates site design and stormwater management to maintain the site's pre-development runoff rates and volumes to minimize further potential adverse impacts associated with increases in impervious surface area.

Wetlands. Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection.

Sections 404 and 401 (through water quality certification) of the CWA regulate the discharge of dredged or fill materials into the waters of the United States. The term "waters of the United States" has a broad meaning under the CWA and incorporates the territorial seas, tributaries, lakes and ponds, impoundments of jurisdictional waters, and adjacent wetlands. USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR § 328.3(c)(4)).

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse impacts and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands unless the agency finds there is no practicable alternative to construction in the wetland and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

Floodplains. Floodplains are areas of low-level ground along rivers, stream channels, large wetlands, or coastal waters. Such lands might be subject to periodic or infrequent inundation

due to rain or melting snow. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling.

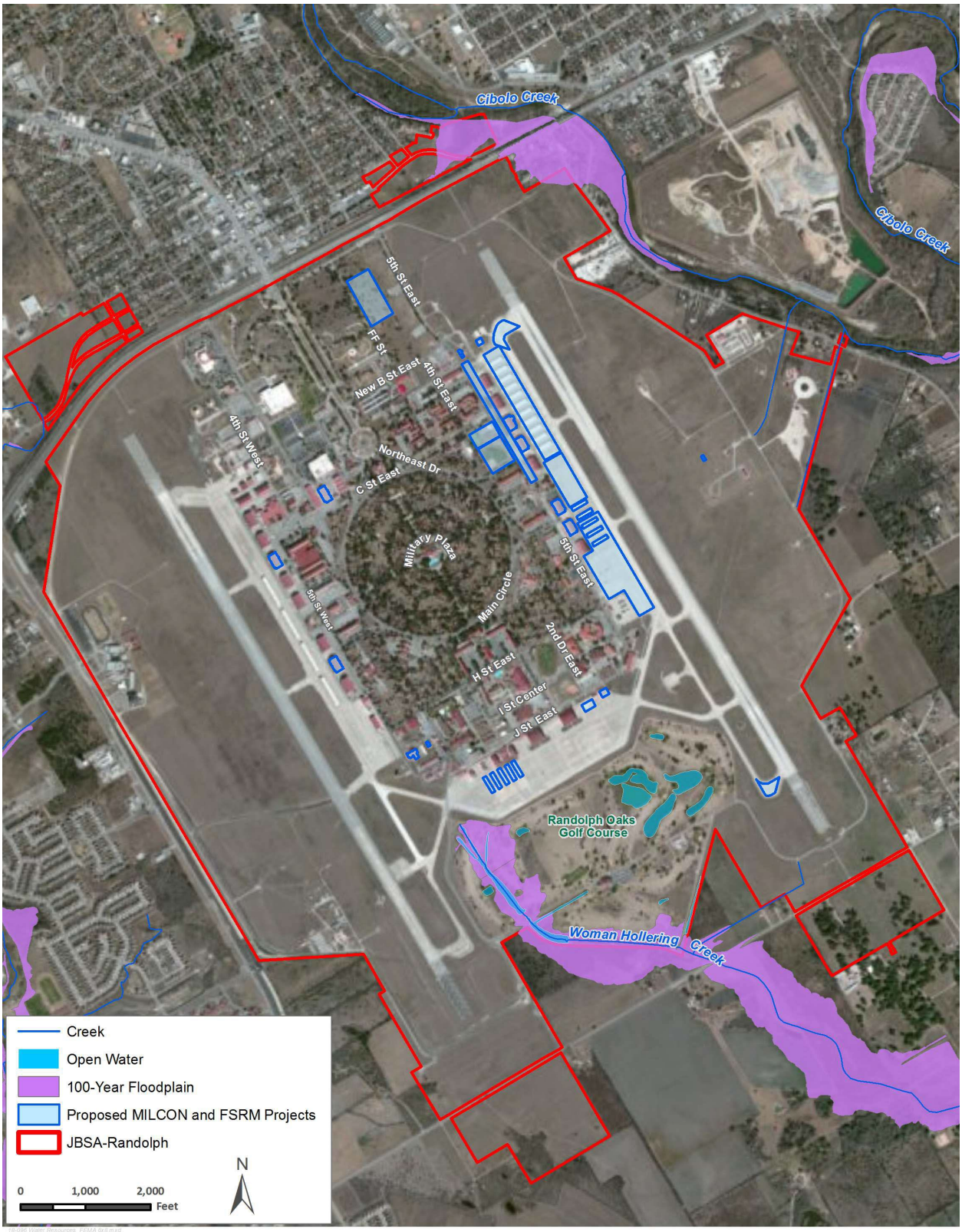
The risk of flooding typically depends on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency, which defines 100-year and 500-year floodplains. The 100-year floodplain is an area that has a 1 percent chance of inundation by a flood event in a given year, while 500-year floodplains have a 0.2 percent chance of inundation in a given year. Certain facilities inherently pose too great a risk to be in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. To reduce the risks to human health and safety, federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities.

EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of Federal Emergency Management Agency Flood Insurance Rate Maps, which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs federal agencies to avoid floodplains unless the agency determines that no practicable alternative exists. Where the only practicable alternative is to site in a floodplain, the agency should develop measures to reduce impacts and mitigate unavoidable impacts.

3.9.2 Affected Environment

Groundwater. JBSA-Randolph is located along the edge of the Edwards Aquifer's Artesian Zone; however, the majority of the installation does not directly overlie the aquifer. The Edwards Aquifer measures approximately 160 miles in length and varies in width from 5 to 40 miles. It is divided into two segments: the San Antonio and Barton Springs segments. The San Antonio segment runs near JBSA-Randolph, which is where most withdrawal for human use occurs. The Barton Springs segment runs from Kyle to the southern portion of Austin. This aquifer is the primary source of water for the City of San Antonio and its surrounding communities, including JBSA-Randolph. Approximately 1.7 million people in the San Antonio-Austin corridor rely on the Edwards Aquifer as their primary source of drinking water. JBSA's withdrawal from the Edwards Aquifer is restricted to 12,012 acre-feet per year as determined by an agreement with USFWS in the Biological Opinion to protect endangered species dependent upon the aquifer (JBSA 2020). JBSA has historically withdrawn less than half of its allotment each year. There are eight groundwater supply wells on JBSA-Randolph, all of which draw from the Edwards Aquifer, but only three are currently in service (JBSA 2018a).

Surface Water. JBSA-Randolph is within the San Antonio River Basin. Surface water features on the installation include artificial ponds at the golf course that are sourced with treated wastewater, Woman Hollering Creek, which southeast flows from the golf course into Cibolo Creek, and an ephemeral offshoot of Cibolo Creek in the northeastern portion of JBSA-Randolph. Cibolo Creek is to the northeast of the installation (see **Figure 3-31**) (JBSA 2020, USFWS 2021f). All stormwater runoff ultimately discharges to Woman Hollering Creek and Cibolo Creek (see **Section 3.7.2**) (JBSA 2020).



Data Sources: Imagery (ESRI 2015); Flood Zones (FEMA Panel 48029C0295F, Eff Date 9/29/2010); Open Water and Creek (JBSA-Randolph GIS).

Figure 3-31. Water Resources at JBSA-Randolph

All JBSA installations maintain SWPPPs to address the applicability of the plans to the various facilities, outline permit requirements, designate SWPPP responsibilities, and recommend BMPs for managing stormwater pollution. As part of the SWPPPs, JBSA has established buffer zones around vulnerable surface water areas, which can lessen the effects of non-point source pollution and create wildlife corridors and habitat suitable for some wildlife species. Development and ground disturbance does not occur within these buffer zones and approved erosion control devices are installed around construction sites to minimize erosion (JBSA 2020). JBSA-Randolph has separate SWPPPs addressing the industrial stormwater permit criteria and the municipal stormwater permit (MS4) criteria.

Wetlands. Wetlands on JBSA-Randolph are limited to the artificial ponds at the golf course and Woman Hollering Creek (see **Figure 3-31**) (USFWS 2021f).

Floodplains. Approximately 28.79 acres of JBSA-Randolph lie within the 100-year floodplain. These portions of the installation are at the golf course along Woman Hollering Creek and in the northeastern portion of the installation along Cibolo Creek (see **Figure 3-31**) (FEMA 2010).

3.9.3 Environmental Consequences

A proposed action could have significant impacts with respect to water resources if any of the following were to occur:

- Substantially reduce water availability or supply to existing users.
- Overdraft groundwater basins.
- Exceed safe annual yield of water supply sources.
- Substantially affect water quality.
- Endanger public health or safety by creating or worsening health or flood hazard conditions.
- Threaten or damage unique hydrologic characteristics.
- Violate established laws or regulations adopted to protect water resources.

Determination of the significance of wetland impacts is based on (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the duration of ecological ramifications. Impacts on wetland resources are considered significant if high-value wetlands would be adversely affected.

3.9.3.1 Proposed Action

Groundwater and Surface Water. Short- and long-term, negligible to minor, adverse impacts on groundwater and surface water would occur from the Proposed Action. The MILCON and FSRM projects would increase impervious surface and decrease area for groundwater infiltration by approximately 132,050 ft^2 leading to potentially decreased recharge of groundwater and increased stormwater runoff into nearby surface water bodies. However, the adverse impacts from the additional impervious surface would be minimized through the use of construction BMPs such as landscaping with native plants and the use of vegetated swales;

Low-Impact Development practices (e.g., bioretention areas and permeable pavement); and by employing long-term stormwater control measures for groundwater recharge in accordance with Section 438 of the EISA. The installation would obtain a Texas Construction General Permit from TCEQ for projects where 1 acre or more would be disturbed, and construction would be governed by the SWPPPs, which contain BMPs and mitigation measures to manage stormwater on the installation. No construction would occur within the buffer zones around vulnerable surface water areas.

None of the MILCON and FSRM projects would occur near the groundwater wells on JBSA-Randolph; therefore, no impacts on these wells would occur. The greater San Antonio region would experience a long-term, negligible increase in the consumption of groundwater from the Edwards Aquifer from the approximately 879-person (i.e., 303 new personnel and 576 dependents) increase associated with the Proposed Action. As calculated in **Section 3.7.3**, the Proposed Action would increase the average daily water demand in the region by 74,538 gpd, which equates to 27,206,370 additional gallons withdrawn each year or 83.5 additional acre-feet per year. Most of this groundwater withdrawal would be consumed at residences off of JBSA and would not count toward the installation's 12,012 acre-feet per year pumping allotment. Because the Edwards Aquifer currently supplies water to approximately 1.7 million people in the region (JBSA 2020), the addition of approximately 879 people to Bexar County would not appreciably increase the demand for potable water or reduce regional groundwater availability in the Edwards Aquifer. No increase in water demand would occur at JBSA-Lackland or Seguin AAF.

As noted in **Section 3.6.3.1**, the increase in aircraft operations as compared to baseline flight activities and the maintenance on the additional aircraft during the T-38C to T-7A transition period would require additional quantities of hazardous materials, hazardous wastes, and petroleum products to be delivered, stored, used, and disposed of at JBSA-Randolph. This temporary increase in hazardous materials, hazardous wastes, and petroleum product management would negligibly increase the potential for an accidental release to occur and for the contamination to reach nearby groundwater aquifers and surface water features. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release to contaminate water resources.

Wetlands. The MILCON and FSRM projects would not occur within or near any of the ponds at the golf course or Woman Hollering Creek on JBSA-Randolph. Therefore, no direct impacts on wetlands would occur. The construction BMPs described for surface water would be implemented to minimize the potential for indirect impacts on downstream wetlands.

Floodplains. The MILCON and FSRM projects would not occur within or near the 100-year floodplain; therefore, no impacts on floodplains would occur.

3.9.3.1.1 Alternative 1

Impacts on water resources from fewer T-7A aircraft and T-7A operations that are at a lower intensity than the Proposed Action (beginning in 2027) would be slightly less than those described for the Proposed Action. Compared to the Proposed Action, fewer aircraft to maintain and aircraft operations at a lower intensity would slightly decrease the potential for an accidental

release of hazardous materials or petroleum products to contaminate groundwater aquifers and surface waters. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release to contaminate water resources.

Although installation of only 52 T-7A shelters under Alternative 1 (rather than 65 shelters under the Proposed Action) would disturb less area, construction impacts on water resources would be identical to those described for the Proposed Action because all shelters would be installed on already impervious surface on the JBSA-Randolph airfield. As such, there would be no difference in the area for groundwater infiltration and potential for increased stormwater runoff into nearby surface water bodies compared to the Proposed Action. The different interior design for the GBTS facility under Alternative 1 would have identical impacts on water resources as the interior design under the Proposed Action. The smaller footprint of the addition to Building 38 under Alternative 1 would result in a negligible difference in impacts from the Proposed Action.

3.9.3.1.2 Alternative 2

Impacts on water resources from T-7A operations that are 15 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action. Compared to the Proposed Action, the increase in operations would slightly increase the potential for an accidental release of hazardous materials or petroleum products to contaminate groundwater aquifers and surface waters. However, the overall potential for a release and for contamination of water resources would not be significantly greater than the Proposed Action. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release to contaminate water resources.

3.9.3.1.3 Alternative 3

Impacts on water resources from T-7A operations that are 25 percent greater than the Proposed Action would be slightly greater than those described for the Proposed Action and Alternative 2. Compared to the Proposed Action and Alternative 2, the increase in operations would slightly increase the potential for an accidental release of hazardous materials or petroleum products to contaminate groundwater aquifers and surface waters. However, the overall potential for a release and for contamination of water resources would not be significantly greater than the Proposed Action or Alternative 2. The JBSA SPCC, P2, and hazardous waste management plans would continue to be followed to lessen the potential for a release to contaminate water resources.

3.9.3.2 No Action Alternative

The No Action Alternative would not impact water resources. No facility construction would occur, and there would be no changes in aircraft operations. The amount of impervious surface on the installation would not change, and no impacts on groundwater recharge or surface water runoff would occur. The demand for potable water and potential for groundwater or surface water contamination would not change. Water resources conditions at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would remain unchanged when compared to the existing conditions described in **Section 3.9.2**.

3.10 Environmental Justice

3.10.1 Definition of the Resource

On February 11, 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued requiring each federal agency to identify and address whether their proposed action results in disproportionately high and adverse environmental and health impacts on low-income or minority populations. The EO is intended to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, tribal, and local programs and policies. This EO also requires that each federal agency conduct its programs, policies, and activities that substantially affect human health and the environment in a manner that do not have the effect of excluding persons (including populations) from participating in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

A 1994 Presidential memorandum accompanying EO 12898 states that existing federal statutes should be used to evaluate environmental justice concerns. One of the referenced statutes is NEPA, and the memorandum highlights the importance of NEPA in addressing environmental hazards in minority and low-income communities. The memorandum states that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities," when such analysis is required by NEPA.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately impact children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." Similarly, potential impacts on senior citizens should also be evaluated. Activities occurring near areas that could have higher concentrations of children or seniors during any given time, such as schools, childcare facilities, and assisted living facilities, might further intensify potential impacts on these groups. To the extent to which children or seniors might be impacted, disproportionate impacts are inherent due to their innate vulnerabilities.

Consideration of environmental justice concerns includes the race, ethnicity, poverty status, and age of populations in the area within which potential impacts from a proposed action could occur. Such information aids in evaluating whether a proposed action would render vulnerable any of the populations targeted for protection.

As defined by CEQ, minority or low-income populations should be identified if the percentage of persons characterized as being minority or low-income within the ROI is either greater than 50 percent, or is meaningfully higher than the community of comparison. CEQ also states, "A

minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ 1997). The community of comparison is the smallest jurisdiction for which U.S. Census data are collected that encompasses the footprint of impacts for all resource areas.

For purposes of this EIS, environmental justice populations are defined as follows:

Minority Population. CEQ defines minority populations as members of the following population groups: Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and some other race, which encompasses those not included in the White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander race categories, and also includes multiracial, mixed, interracial persons; and Hispanic or Latino (CEQ 1997). The U.S. Census Bureau considers race and Hispanic or Latino origin (ethnicity) as separate concepts, and these data are recorded separately.

Low-income Population. A low-income population is the percentage of a population in households where the household income is less than or equal to twice the federal "poverty level" (USEPA 2021c). For 2018, the federal poverty level, or threshold, for a two-person household under 65 years old was $16,889 (U.S. Census Bureau 2021).

In addition to environmental justice populations, DAF identifies sensitive receptors to be considered in environmental justice analyses. These populations are defined as follows:

Youth Population. The percentage of a population that is age 17 or younger (DAF 2014b).

Elderly Population. The percentage of a population that is age 65 or older (DAF 2014b).

Data used from the American Community Survey 5-Year Census Estimates (2014 to 2018) and USEPA's EJScreen mapping and screening tool are used to assess impacts on minority, low-income, senior, and youth populations.

3.10.2 Affected Environment

The environmental justice ROI (see **Figure 3-32**, **Figure 3-33**, and **Figure 3-34**) consists of 62 Census Block Groups that include JBSA-Randolph (49 Census Block Groups), Seguin AAF (11 Census Block Groups), and JBSA-Lackland (2 Census Block Groups) as listed in **Table 3-77**. The communities of comparison are Guadalupe County, Bexar County, and Comal County, which encompass the Census Block Groups that make up the environmental justice ROI.

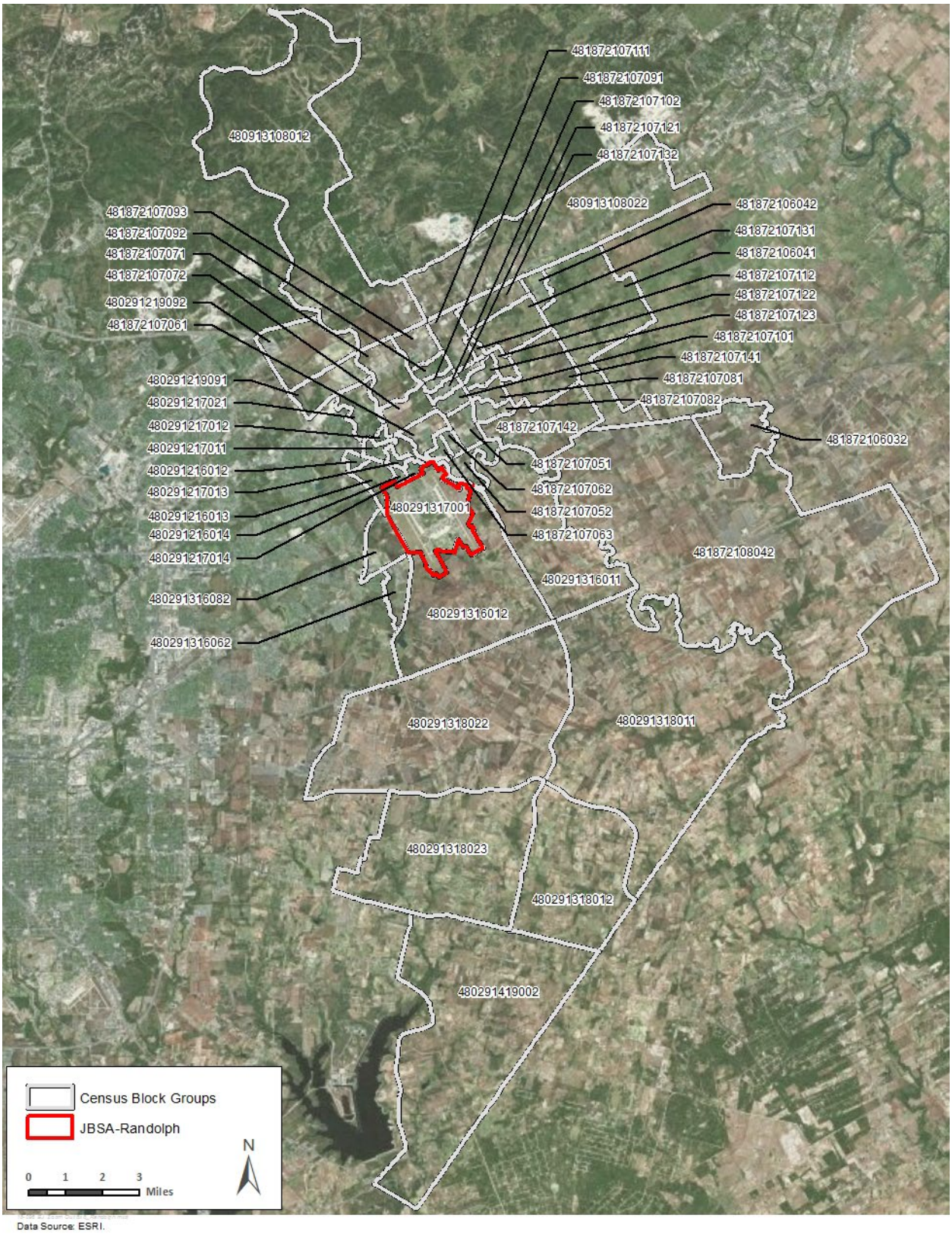


Figure 3-32. Environmental Justice ROI at JBSA-Randolph

Figure 3-33. Environmental Justice ROI at JBSA-Lackland

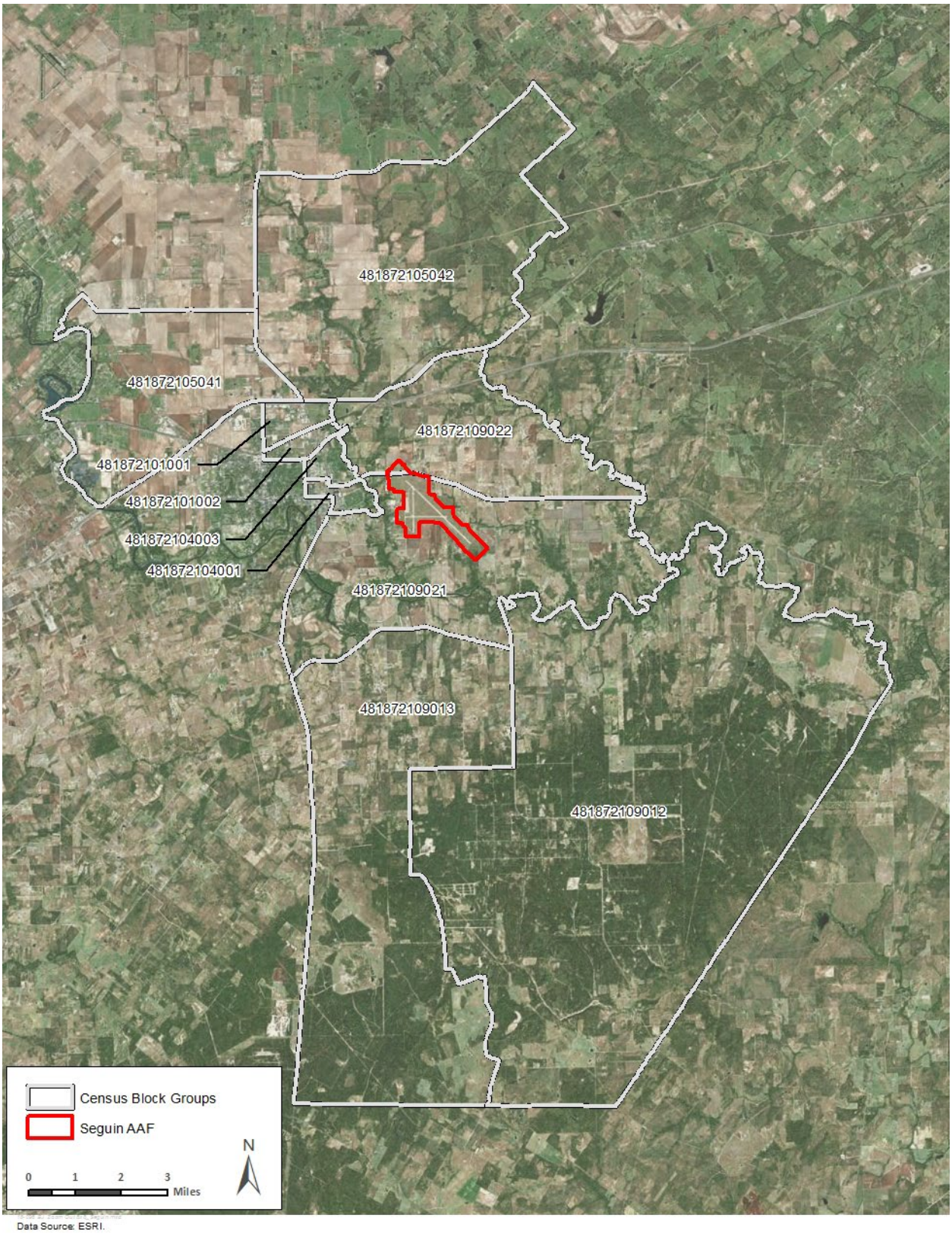


Figure 3-34. Environmental Justice ROI at Seguin AAF

Table 3-77. Environmental Justice Populations Proximal to the Project Area

Census Data Unit	County	Installation	Total Population	Percent Minority Population	Percent Low-Income Population	Percent Youth Population	Percent Elderly Population
Census Block Group Data							
480291317001	Bexar	JBSA-Randolph	1,182	35	14	57	2
480291216013	Bexar	JBSA-Randolph	1,661	70	31	41	8
480291217012	Bexar	Near JBSA-Randolph	811	30	13	21	33
480291217014	Bexar	Near JBSA-Randolph	1,221	71	47	43	5
480291316011	Bexar	Near JBSA-Randolph	839	37	30	21	17
480291316012	Bexar	Near JBSA-Randolph	3,484	64	3	45	5
480291318022	Bexar	Near JBSA-Randolph	575	21	22	29	14
480291219092	Bexar	Near JBSA-Randolph	4,615	66	19	46	5
480291219091	Bexar	Near JBSA-Randolph	3,337	60	6	24	9
480291419002	Bexar	Near JBSA-Randolph	1,662	30	16	11	20
480291217013	Bexar	Near JBSA-Randolph	651	39	44	27	34
480291217011	Bexar	Near JBSA-Randolph	1,508	44	32	35	19
480291217021	Bexar	Near JBSA-Randolph	3,477	51	12	35	13
480291318023	Bexar	Near JBSA-Randolph	2,007	48	37	22	16
480291318011	Bexar	Near JBSA-Randolph	1,433	14	15	22	20
480291316082	Bexar	Near JBSA-Randolph	3,350	85	20	38	5
480291316062	Bexar	Near JBSA-Randolph	3,248	72	30	42	5
480291216014	Bexar	Near JBSA-Randolph	1,231	58	62	43	7
480291216012	Bexar	Near JBSA-Randolph	1,397	44	40	36	14
480291318012	Bexar	Near JBSA-Randolph	678	15	3	18	22
480913108012	Comal	Near JBSA-Randolph	2,328	32	5	25	16
480913108022	Comal	Near JBSA-Randolph	4,711	50	33	41	8
481872107052	Guadalupe	Near JBSA-Randolph	1,102	34	25	27	17

Census Data Unit	County	Installation	Total Population	Percent Minority Population	Percent Low-Income Population	Percent Youth Population	Percent Elderly Population
481872107061	Guadalupe	Near JBSA-Randolph	3,791	59	47	38	9
481872107063	Guadalupe	Near JBSA-Randolph	928	51	27	20	23
481872107071	Guadalupe	Near JBSA-Randolph	3,508	59	24	43	4
481872107072	Guadalupe	Near JBSA-Randolph	2,080	45	17	27	13
481872106042	Guadalupe	Near JBSA-Randolph	2,553	59	9	35	12
481872107132	Guadalupe	Near JBSA-Randolph	2,930	58	15	42	7
481872107131	Guadalupe	Near JBSA-Randolph	3,300	60	12	36	5
481872107111	Guadalupe	Near JBSA-Randolph	2,554	41	10	33	14
481872107112	Guadalupe	Near JBSA-Randolph	1,010	62	11	32	9
481872107092	Guadalupe	Near JBSA-Randolph	2,274	39	20	44	9
481872107051	Guadalupe	Near JBSA-Randolph	3,497	68	17	32	11
481872107121	Guadalupe	Near JBSA-Randolph	683	41	3	10	12
481872108042	Guadalupe	Near JBSA-Randolph	3,115	17	21	22	18
481872107141	Guadalupe	Near JBSA-Randolph	7,730	57	15	41	5
481872107081	Guadalupe	Near JBSA-Randolph	3,506	42	5	31	6
481872106041	Guadalupe	Near JBSA-Randolph	6,244	53	8	36	14
481872107142	Guadalupe	Near JBSA-Randolph	2,621	51	36	28	19
481872107082	Guadalupe	Near JBSA-Randolph	3,148	50	21	32	12
481872107123	Guadalupe	Near JBSA-Randolph	2,521	25	8	28	9
481872107101	Guadalupe	Near JBSA-Randolph	2,180	48	5	33	10
481872107102	Guadalupe	Near JBSA-Randolph	1,747	43	11	26	19
481872107062	Guadalupe	Near JBSA-Randolph	965	68	31	32	23
481872107093	Guadalupe	Near JBSA-Randolph	874	24	17	35	12
481872107122	Guadalupe	Near JBSA-Randolph	1,768	52	7	42	13
481872107091	Guadalupe	Near JBSA-Randolph	1,577	50	20	27	14
481872106032	Guadalupe	Near JBSA-Randolph	500	70	47	28	21

Census Data Unit	County	Installation	Total Population	Percent Minority Population	Percent Low-Income Population	Percent Youth Population	Percent Elderly Population
480299801001	Bexar	JBSA-Lackland	709	35	69	24	3
480291614001	Bexar	JBSA-Lackland	6,454	54	24	19	0
481872109021	Guadalupe	Seguin AAF	2,634	34	24	18	21
481872109022	Guadalupe	Near Seguin AAF	1,140	42	22	25	15
481872109013	Guadalupe	Near Seguin AAF	2,347	50	41	12	18
481872105042	Guadalupe	Near Seguin AAF	1,902	48	19	25	15
481872101002	Guadalupe	Near Seguin AAF	1,129	78	59	27	21
481872101001	Guadalupe	Near Seguin AAF	1,589	90	36	36	7
481872104003	Guadalupe	Near Seguin AAF	1,386	45	41	33	19
481872104001	Guadalupe	Near Seguin AAF	2,005	36	36	38	17
481872105041	Guadalupe	Near Seguin AAF	4,634	52	32	29	14
481872108011	Guadalupe	Near Seguin AAF	2,849	34	21	36	19
481872109012	Guadalupe	Near Seguin AAF	1,619	24	38	22	15
County Data							
Bexar	-		1,925,865	72	37	33	12
Comal	-		135,097	32	23	28	18
Guadalupe	-		155,137	49	25	32	13

Source: USEPA 2021d

Notes: Red cells indicate population percentages meaningfully (assumed to be 10 percent) greater than that of the community of comparison or greater than 50 percent.

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The environmental justice ROI does not include any Census Block Groups beneath the airspace areas. Impacts that would potentially be realized in the airspace areas would include aircraft air emissions and aircraft noise. The impacts associated with both are addressed in **Sections 3.1** and **3.2**, respectively. The source of the emissions and noise would be from the aircraft flying at training altitudes along established routes currently flown by T-38C aircraft and other DAF aircraft in the local area. The populations under the MOAs, ranges, and MTRs are generally rural in nature and very low density. The effects of the emissions and noise would not be focused on any particular geographical area or population and spread across a broad area. Based on this, DAF has concluded that the Proposed Action and alternative aircraft operations in the training airspace would not cause disproportionately high and adverse health or environmental effects on minority or low-income populations. Likewise, DAF has determined that there are no environmental health and safety risks associated with the Proposed Action or alternatives for aircraft operations in the training airspace that would disproportionately affect children. Therefore, environmental justice in the airspace areas is not analyzed further.

JBSA-Randolph

Minority Populations. Minority populations greater than 50 percent of the total census block group populations or meaningfully (at least 10 percent) greater than that of the community of comparison, Bexar County, are found in 26 of the 49 Census Block Groups in the JBSA-Randolph ROI (see **Table 3-77**; USEPA 2021d).

Low-Income Populations. Low-income populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Bexar County, are found in 4 of the 49 Census Block Groups in the JBSA-Randolph ROI (see **Table 3-77**; USEPA 2021d).

Youth Population. Youth populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Bexar County, are found in 6 of the 49 Census Block Groups in the JBSA-Randolph ROI (see **Table 3-77**; USEPA 2021d).

Elderly Population. Elderly populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Bexar County, are found in 2 of the 49 Census Block Groups in the JBSA-Randolph ROI (see **Table 3-77**; USEPA 2021d).

On JBSA-Randolph, there are housing areas, a Child Development Center, a Youth Program Center, schools, parks and a library. Immediately outside of the installation boundary are many residential communities, schools, parks, and an assisted living center.

JBSA-Lackland

Minority Populations. A minority population greater than 50 percent of the total census block group populations is found in one of the two Census Block Groups in the JBSA-Lackland ROI, Census Block Group 480291614001 (see **Table 3-77**; USEPA 2021d).

Low-Income Populations. A low-income population greater than 50 percent of the total census block group populations and meaningfully greater than that of the community of comparison, Bexar County, is found in one of the two Census Block Groups in the JBSA-Lackland ROI, Census Block Group 480299801001 (see **Table 3-77**; USEPA 2021d).

Youth Population. No youth populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Bexar County, are found in the Census Block Groups in the JBSA-Lackland ROI (see **Table 3-77**; USEPA 2021d).

Elderly Population. No elderly populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Bexar County, are found in the Census Block Groups in the JBSA-Lackland ROI (see **Table 3-77**; USEPA 2021d).

On JBSA-Lackland, there are a few residential neighborhoods, schools, a library, a Youth Program Center, and parks. Immediately outside of the installation boundary are many residential communities, schools, and parks.

Seguin AAF

Minority Populations. Minority populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Guadalupe County, are found in 4 of the 11 Census Block Groups in the Seguin AAF ROI (see **Table 3-77**; USEPA 2021d).

Low-Income Populations. Low-income populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Guadalupe County, are found in 6 of the 11 Census Block Groups in the Seguin AAF ROI (see **Table 3-77**; USEPA 2021d).

Youth Populations. No youth populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Guadalupe County, are found in the Census Block Groups in the Seguin AAF ROI (see **Table 3-77**; USEPA 2021d).

Elderly Populations. No elderly populations greater than 50 percent of the total census block group populations or meaningfully greater than that of the community of comparison, Guadalupe County, are found in the Census Block Groups in the Seguin AAF ROI (see **Table 3-77**; USEPA 2021d).

There are no residences on Seguin AAF, but there is a residential community approximately 2.5 miles to the southwest, and many isolated residences are scattered in the area surrounding the airfield. There are also a few assisted living centers and schools in the neighborhoods surrounding Seguin AAF.

3.10.3 Environmental Consequences

Impacts on environmental justice were assessed to determine whether the Proposed Action would result in disproportionately high and adverse human health and environmental impacts on environmental justice populations (i.e., minority or low-income populations greater than 50 percent of the total population or meaningfully greater than that of the community of comparison) or sensitive receptors (i.e., youth or elderly populations greater than 50 percent of the total population or meaningfully greater than that of the community of comparison) within the environmental justice ROI. Impacts would be considered significant if they disproportionately affect environmental justice populations or sensitive receptors compared to the general population. Significant impacts on environmental justice populations and sensitive receptors could include a substantial increase in noise levels and air emissions during construction and from increased aircraft operations.

3.10.3.1 Proposed Action

JBSA-Randolph. Short-term, minor, adverse impacts at JBSA-Randolph would generally include increased noise from construction vehicles and operation of equipment and increased air pollution from construction emissions during implementation of the MILCON and FSRM projects. Long-term, adverse impacts from noise on environmental justice populations and sensitive receptors would be reduced through implementation of one of the MILCON projects, construction of a new hush house facility. This hush house would reduce noise from aircraft systems testing that occurs on the installation. Construction noise and air emissions would equally impact all populations in the affected area, thereby not disproportionately impacting environmental justice and sensitive receptor populations.

Long-term, moderate, adverse impacts would include increased noise and air emissions from the increase in aircraft and operations starting in FY 2023. Because impacts from air emissions would be consistent across all populations, environmental justice and sensitive receptor populations would not be disproportionately impacted. See **Section 3.1** for further discussion of air emissions.

The Census Block Groups that would be most affected from increased aircraft operations due to higher noise levels would be 480291316012, 480291217012, 481872107061, 481872107063, and 480291317001 (see **Section 3.2** for further discussion of noise impacts). These Census Block Groups contain environmental justice populations at levels both above and below 50 percent of the total population and the community of comparison levels. Adverse impacts from noise and air emissions would be expected, but increased noise levels would equally impact all populations. Therefore, the Proposed Action would not disproportionately impact environmental justice and sensitive receptor populations.

As part of the Environmental Justice analysis, it is incumbent to also review how a proposed action may affect the health risks and safety risks of children in accordance with EO13045 **Section 3.2.3.1.1.2** addresses the overall aircraft noise impacts associated with flight operations under the Proposed Action. The discussion includes the overall sound levels at representative locations, including several schools as identified in **Table 3-25**. **Table 3-27** identifies the number of events at representative locations, including these schools, that would interfere with speech due to the proposed air operations with the T-7A operations. **Table 3-28**

provides information on class time that would be interfered with in terms of minutes per school day. Although this interruption of classroom communication is not a direct risk to the health or safety of children within those classrooms, it does present an impact on learning time. However, the impacts are not disproportionate as aircraft training patterns currently used and proposed for continued use are not deliberately planned patterns to focus noise in any specific location. Therefore, the disruption of classroom time is not a specific or direct environmental justice or risk to children's health or safety issue. Accordingly, as discussed in detail in **Section 3.2**, impacts to classroom interruptions are not significant, particularly with the application of measures discussed Mitigated Alternative 1.

JBSA-Lackland. Long-term, minor, adverse impacts would include increased noise and air emissions long-term from additional aircraft and operations under the Proposed Action. Because air emissions would be consistent across all populations, environmental justice and sensitive receptor populations would not be disproportionately impacted. See **Section 3.1** for further discussion of air emissions.

As described in the **Section 3.2**, the T-7A would not contribute appreciably to the noise at JBSA-Lackland, and the overall noise environment surrounding JBSA-Lackland would not be perceptibly different with or without them. In addition, any minor, adverse impacts from noise would equally impact all populations. Therefore, the Proposed Action would not disproportionately impact environmental justice and sensitive receptor populations.

Seguin AAF. Long-term, moderate, adverse impacts would include increased noise and air emissions long-term from additional aircraft and operations under the Proposed Action. Because air emissions would be consistent across all populations, environmental justice and sensitive receptor populations would not be disproportionately impacted. See **Section 3.1** for further discussion of air emissions.

The Census Block Groups that would be most affected from increased aircraft operations due to higher noise levels would be 481872109021 and 481872109022 (see **Section 3.2** for further discussion of noise impacts). These Census Block groups contain environmental justice populations but at levels below 50 percent of the total population and not meaningfully greater than the community of comparison levels. Adverse impacts from noise would be expected, but increased noise levels would equally impact all populations. Therefore, the Proposed Action would not disproportionately impact environmental justice and sensitive receptor populations.

3.10.3.1.1 Alternative 1

Impacts from implementation of Alternative 1 would be similar to but slightly less than those described for the Proposed Action. Noise and air emissions would be still increase from existing conditions, but at a lower level than the projected levels under the Proposed Action. Because air emissions and noise impacts would be consistent across all populations, environmental justice and sensitive receptor populations would not be disproportionately impacted. See **Section 3.2** for further discussion of noise impacts.

3.10.3.1.2 Alternative 2

Impacts from implementation of Alternative 2 would be similar to but slightly greater than those described for the Proposed Action. While noise and air emissions would further increase as a

result of operations running at 115 percent of projected levels under the Proposed Action, air emissions and noise impacts would be consistent across all populations and not disproportionately impact environmental justice and sensitive receptor populations. See **Section 3.2** for further discussion of noise impacts.

3.10.3.1.3 Alternative 3

Impacts from implementation of Alternative 3 would be greater than those described for the Proposed Action. While noise and air emissions would further increase as a result of operations running at 125 percent of projected levels under the Proposed Action, air emissions and noise impacts would be consistent across all populations and not disproportionately impact environmental justice and sensitive receptor populations. See **Section 3.2** for further discussion of noise impacts.

3.10.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented, and existing conditions would remain. Therefore, there would be no new impacts on environmental justice populations.

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4. Cumulative Impacts

Federal regulations implementing NEPA (40 CFR §§ 1500–1508) require that cumulative impacts of a proposed action be assessed. CEQ regulations implementing the procedural provisions of NEPA define cumulative impacts as follows (40 CFR § 1508.47):

> "The impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

Cumulative impacts can be additive (i.e., the net adverse cumulative impacts are strengthened by the sum of individual impacts), countervailing (i.e., the net adverse cumulative impacts are less because of the interaction between beneficial and adverse individual impacts), or synergistic (i.e., the net adverse cumulative impacts are greater than the sum of the individual impacts). Cumulative impacts could result from individually minor, but collectively significant, actions that take place over time. Accordingly, a cumulative impacts analysis identifies and defines the scope of other actions and their interrelationship with a proposed action if there is an overlap in space and time.

Cumulative impacts may occur when there is a relationship between a proposed action and other actions expected to occur in a similar location (i.e., overlapping geographic location) or during a similar time period (i.e., coincidental or sequential time of events). This relationship may or may not be obvious. The impacts may then be incremental and may result in cumulative impacts. Actions overlapping with or in proximity to a proposed action can reasonably be expected to have more potential for cumulative impacts 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 impacts.

This section discusses the potential for cumulative impacts caused by the Proposed Action when combined with other past, present, and reasonably foreseeable actions.

4.1 Past, Present, and Reasonably Foreseeable Actions

This section evaluates the cumulative impacts of the Proposed Action by determining the incremental contribution of the Proposed Action together with past, present, and reasonably foreseeable actions. The MILCON and FSRM projects analyzed in this EIS have been identified by the installation as those that would occur within the reasonably foreseeable future and detailed descriptions of these projects are included in **Section 2.3**. **Table 4-1** summarizes sizeable past, present, and reasonably foreseeable actions at JBSA-Randolph, JBSA-Lackland, and within the region that might interact with the Proposed Action. The table briefly describes each action and presents the proponent, location, and timeframe (e.g., past, present/ongoing, future) of the action.

Table 4-1. Past, Present, and Reasonably Foreseeable Actions at JBSA and Associated Region

Action	Location	Timeframe	Description
Military Actions			
Foreign Military Sales F-16 & F-35 Beddown	JBSA-Lackland/ Kelly Field	Future (2023)	F-16 and F-35 aircraft will be sold under the Foreign Military Sales (Program. Beddown at the selected location is proposed for 2023 (AFCEC/CZN 2020). The JBSA-Lackland location is one alternative being considered; however, it is not the likely preferred alternative due to various logistics, environmental, and cost issues. JBSA-Randolph and Seguin AAF are not under consideration.
Basic Military Training Dormitory	JBSA-Lackland	Future (2023)	Construct a permanent Basic Military Training recruit dormitory (219,844 ft^2) and Airman Training Complex to replace old, outdated facilities. The new dormitory would have the capacity to house a Basic Military Training Squadron and a Training Support Squadron including dormitory space to accommodate 1,248 enlisted recruits. The Airman Training Complex would require demolition of Buildings 146, 7357, 7364, 7366, 7368, 7475, 7481, 2015, 2018, and 2020 (264,690 ft^2 total) and would be designed in accordance with UFC criteria (AFCEC/CZN 2020, DAF 2020c, Cisneros 2020).
Texas Army National Guard Consolidated Campus Plan	JBSA-Lackland/ Kelly Field	Future (2023)	Consolidate 10 UH-60 and 16 AH-64 helicopter aircraft at JBSA-Lackland (Kelly Field) for the Texas Army National Guard Consolidated Campus Plan. The consolidation is proposed to be completed in 2025. The proposal would utilize existing facilities and require some facility renovations. JBSA-Randolph and Seguin AAF are not under consideration.
Luke East Gate Realignment	JBSA-Lackland	Future (2023)	Realign the Luke East Gate including upgrades to accommodate vehicle queuing and ensure compliance with ACP guidance (26,600 ft^2). Other construction components include additional force protection and security measures (AFCEC/CZN 2020, DAF 2020c).
Child Development Center	JBSA-Lackland	Future (2023)	Construct a Child Development Center on a 10.6-acre site at the northwest corner of George Avenue and Selfridge Avenue within the Lackland West Planning District. The MILCON project also would include demolition of Building 2602 (7,771 ft^2), which is the current Child Development Center (AFCEC/CZN 2020, JBSA 2018a).
Information Warfare Center	JBSA-Lackland	Future (2026)	Construct an Information Warfare Center (205,000 ft^2) for Sixteenth Air Force (Air Forces Cyber) Headquarters within the Lackland East Planning District, east of Kelly Field, to accommodate the entire Air Force Information Warfare Center. This construction project may include demolition activities (AFCEC/CZN 2020, JBSA 2018a).

Action	Location	Timeframe	Description
Programmed MILCON Projects	JBSA-Randolph	Future (2023)	Construct a Child Development Center within the Flight Operations Planning District. Siting location is undetermined at this time. The MILCON project would include demolition of Building 152 (4,526 ft^2), which is the current Child Development Center (AFCEC/CZN 2020, JBSA 2018a).
		Future (2027)	Construct a Consolidated Mission Support Complex (CE/SFS/LRS) (AFCEC/CZN 2020).
Programmed MILCON Projects	JBSA-Lackland	Future (2023)	Implement various large-scale MILCON projects including construction of a Basic Military Training chapel for America's Airmen (75,500 ft^2), construction of a cyber operations center (41,850 ft^2), construction of a human performance lab and combat conditioning center, and construction of a DAF Office of Special Investigations facility. Some of these construction projects would also include demolition of old facilities (AFCEC/CZN 2020, DAF 2020c).
Programmed Non-MILCON Projects	JBSA-Lackland	Future (2022-2024)	Implement various projects including construction of a military working dog lab within the military working dog training area and an additional wing for the Office of Special Investigation at Building 315 on the west site of JBSA-Lackland. Both projects would be sited within the Medina Training Annex (AFCEC/CZN 2020, JBSA 2018a).
Programmed Unspecified Minor Military Construction	JBSA-Randolph	Future (2023)	Implement various small-scale construction projects including 902 Security Forces Squadron Canine Kennel drainage features. Project may include minor demolition activities (AFCEC/CZN 2020).
Programmed Unspecified Minor Military Construction	JBSA-Lackland	Future (2023)	Implement various small-scale construction projects including additions/alterations to the Growden Gate (Buildings 1213 and 1217) within the Airfield Operations Planning District and the Valley Hi Visitor Center within the Lackland West Planning District. Some of these construction projects may include minor demolition activities (AFCEC/CZN 2020, JBSA 2018a).
State and Local Actions			
TxDOT Roadway Projects	FM 78	Present, Future	Surface/roadway restoration for 1.77 miles of State Highway Spur 371 from Billy Mitchell Road to U.S. Highway 90, which is east of the Lackland airfield. Construction is ongoing. Surface/roadway restoration for 3.824 miles of State Highway Loop 13 from U.S. Highway 90 to Leon Creek. Construction is ongoing. Resurface 2.19 miles of FM 78 from Loop 1604 to the Bexar/Guadalupe County Line. Construction to begin within the next 4 years. Resurface 8.705 miles of U.S. Highway 90 from Horal Street to State Highway Loop 353, which is north of the Lackland Airfield. Construction to begin within the next 4 years (TxDOT 2021b).

Action	Location	Timeframe	Description
City of Seguin Proposed New Subdivisions	In and around Seguin, Texas	Present, Future	The City of Seguin Economic Development Corporation has identified over 12,000 residential housing units that are either tied to a development that is under construction or tied to a development with plans in review by the City of Seguin. Currently, there are twenty-two subdivisions under constructions within the City of Seguin and more expected to break ground in the near future (see **Figure 3-27)**.

Past activities are those actions that occurred within the geographic scope of cumulative impacts that have shaped the current environmental conditions at JBSA-Randolph and the surrounding area. JBSA was created following a 2005 Base Realignment and Closure recommendation to consolidate functions at the various military installations in the Greater San Antonio region into a single installation commanded by DAF. JBSA is comprised of three primary sites (i.e., JBSA-Randolph, JBSA-Lackland, and JBSA-Fort Sam Houston) and eight other operating sites, which includes Seguin AAF. JBSA-Randolph was established in 1931 as a flight training facility for the United States Air Corps and continues to serve as a basic pilot training facility. JBSA-Lackland was constructed in the early 1940s and has served, at various times, as a bivouac area and bombing range, Air Corps replacement-training center, preflight school and classification center, advanced flying center, and officer cadet training facility. JBSA-Lackland is now the sole location for DAF enlisted Basic Military Training (JBSA 2015). Seguin AAF was established in 1941 to serve as an auxiliary airfield for JBSA-Randolph and continues to serve as a training airfield. The facilities and infrastructure at JBSA have undergone several major periods of construction and reconstruction since the initial establishment of each installation to accommodate new missions and commands. For most resource areas—such as biological resources, geological resources, infrastructure and transportation, hazardous materials and wastes, and water resources—the impacts of past actions are now part of the existing environment and are incorporated in the description of the affected environment in **Section 3**.

4.1.1 Cumulative Impacts

The following analysis qualitatively examines the cumulative impacts that would result from the incremental impacts of the Proposed Action when combined with past, present, and reasonably foreseeable future actions identified in **Table 4-1**.

Air Quality. The State of Texas considers the impacts of all past, present, and reasonably foreseeable emissions during the development of the State Implementation Plan. The state accounts for all significant stationary, area, and mobile emission sources in the development of this plan. Recapitalization of T-7A aircraft at JBSA would include an increase in flight operations during and following the T-38C and T-7A transition period, resulting in long-term, significant, adverse effects on air quality for the Proposed Action and all alternatives except for Alternative 1 and Mitigated Alternative 1.

Emissions of criteria pollutants from construction associated with T-7A recapitalization at JBSA and present and reasonably foreseeable actions at JBSA and within the surrounding area would be directly produced from building construction and demolition, and aircraft operations. The

initial delivery of T-7A aircraft would occur in 2023 and T-7A aircraft operations would be phased in with both T-38C and T-7A operations occurring simultaneously through 2031. Facility construction and upgrades through 6 MILCON and 13 FSRM projects would be implemented and coordinated with T-7A arrival.

Cumulatively, the MILCON and FSRM construction and demolition activities associated with the Proposed Action and the past, present, and reasonably foreseeable actions (see **Table 4-1**) would result in short-term, intermittent increases in air pollutant emissions on and near the installation during phases of construction that may overlap. Air emissions from MILCON and FSRM construction and demolition activities would be temporary in nature and produced only when such activities are occurring. Additionally, concurrent construction of the MILCON and FSRM projects under the Proposed Action combined with on- and off-installation development projects would result in minor, cumulative increases in vehicle emissions from increases in traffic. BMPs and environmental control measures outlined in **Section 3.1**, including dust suppression, would minimize impacts from the Proposed Action and other past, present, and reasonably foreseeable actions. Additionally, work vehicles for projects on and off the installation are assumed to be well maintained and use diesel particulate filters to reduce particulate matter air emissions.

Long-term, minor, adverse, cumulative impacts on air quality would be anticipated from heating new building space and operating new emergency generators; however, these emissions would be expected to be sufficiently below major source thresholds, would not increase the potential to emit above major source thresholds, and appropriate state operating permits would be obtained for these sources. Increased automobile traffic from potential increases in personnel from the present and reasonably foreseeable projects would also produce new air emissions, but these air emissions, when combined with similar emissions from the Proposed Action, would not appreciably degrade air quality with Bexar County.

The unmitigated recapitalization of T-7A aircraft at JBSA-Randolph could result in significant impacts on air quality. Air emissions from reasonably foreseeable projects within the area (such as the Foreign Military Sales beddown and the Texas Army National Guard consolidation at JBSA-Lackland) combined with expected air emissions from T-7A recapitalization at JBSA-Randolph, will increase NOx concentrations within the Bexar County ozone nonattainment area. The increase in ambient NOx will potentially exasperate the state's plan to bring the area back into attainment with the ozone air standards. However, under the GCR, each independent action will need to be *de minimis* (insignificant) or demonstrate compliance with the state's plan to achieve attainment in order to legally be implemented. Therefore, ultimately the combined air quality impact will be kept to a minimum by the constraints built into the complying with the GCR.

Noise. Recapitalization of T-7A aircraft at JBSA-Randolph and present and reasonably foreseeable construction and renovation actions at JBSA-Randolph, JBSA-Lackland, and within the surrounding area would result in intermittent, short-term, temporary increases on the noise environment. Noise generated by heavy equipment during construction would be intermittent, short term, and temporary in nature. Given the temporary or intermittent nature of the proposed activities, distance to nearby noise-sensitive areas, and the existing noise environment,

adverse, cumulative impacts on sensitive receptors from reasonably foreseeable construction actions would be negligible to minor. The Proposed Action and present and reasonably foreseeable future actions would adhere to all applicable federal, state, and local noise regulations, when appropriate. Additionally, adhering to standard BMPs listed in **Section 3.2**, such as maintaining heavy equipment mufflers and limiting heavy equipment use to normal weekday business hours, noise impacts generated by construction activities under the Proposed Action and present and reasonably foreseeable future projects would result in only temporary increases in ambient noise levels.

Increased aircraft operations would occur from the Proposed Action and significant adverse impacts on the noise environment would be anticipated. Noise from reasonably foreseeable projects within the area, such as the Foreign Military Sales beddown and the Texas Army National Guard consolidation at JBSA-Lackland, combined with expected noise increases from recapitalization of T-7A aircraft at JBSA, may result in adverse, cumulative impacts. The noise levels and contours from the additional F-16 and F-35 operations are unknown; however, these aircraft would not likely operate in the JBSA-Randolph or Seguin AAF vicinity where the majority of T-7As would be operating and potentially contributing to a significant impact. The projects would share airspace including MOAs and MTRs, and there would be a cumulative adverse noise impact in those specific airspace areas. Noise abatement procedures described in **Section 3.2**, such as avoiding noise-sensitive areas during low-level flight and reducing the occurrence of high-power turns outside normal working hours may facilitate a reduction of adverse cumulative impacts.

The increase in aircraft noise would have an impact on the projected housing in and around Seguin Texas as shown on the Seguin, Texas economic development website (https://www.seguinedc.com/life-in-seguin/housing) once the housing is built. However, the proposed mitigation would reduce power settings for aircraft flights resulting in smaller aircraft noise contours, and would not result in a significant cumulative impact on land use.

Biological Resources. Short- and long-term, minor, adverse cumulative impacts would occur on vegetation and the associated habitats from construction and demolition related to the MILCON and FSRM projects under the Proposed Action and past, present, and reasonably foreseeable actions including construction projects at JBSA-Randolph and JBSA-Lackland. Most of the areas sited for the Proposed Action and reasonably foreseeable actions are within highly urban areas or on previously disturbed surfaces, and vegetation permanently lost from construction actions would be minimal.

Short-term, minor, adverse cumulative impacts on wildlife would occur from ground disturbance during construction and demolition activities, which may remove habitat and displace wildlife species. Disturbances would be expected to be minor, and it is assumed that vegetation surrounding new construction would be restored, as practicable. On-installation vegetation restoration would be planted in accordance with the BASH program and base Vegetation Management Plan to reduce the occurrence of bird/aircraft strikes. Long-term, minor, adverse cumulative impacts on wildlife would occur from the permanent loss of potential wildlife habitat such as trees or forested areas. In addition, long-term, minor, adverse cumulative noise impacts on wildlife would occur from increases in air operations under the Proposed Action and

beddown of Foreign Military Sales aircraft at JBSA-Lackland; however, federally listed species at JBSA-Randolph, JBSA-Lackland, or Seguin AAF have not been observed, and state sensitive species are not known to occur near JBSA airfields. Therefore, cumulative impacts on biological resources from loss of potential habitat and increases in aircraft noise would not be significant.

Cultural Resources. Construction of the MILCON and FSRM projects and past, present, and reasonably foreseeable construction actions at JBSA and within the surrounding area could result in short- and long-term, minor, adverse cumulative impacts on cultural resources if any construction action were to occur within the Randolph Field NHLD or to other eligible cultural resources at JBSA-Randolph, JBSA-Lackland, or Seguin AAF. Adverse impacts on cultural resources could result if an introduced element changes elements or characteristics of a historic property that make the property eligible for listing in the NRHP. New buildings constructed under the Proposed Action and reasonably foreseeable actions would not introduce elements that could alter the visual significance of a cultural resource or result in changes to any characteristic of a cultural resource, including the Randolph Field NHLD, that could make it ineligible for listing in the NRHP. To maintain cultural and visual integrity, facility construction and demolition actions would implement architectural and historical design features where applicable to ensure new buildings maintain existing cultural significance. Although all of the on- and off-installation projects would involve some level of ground disturbance, these projects are not anticipated to impact archaeological resources. JBSA-Randolph does not contain any archaeological resources that are eligible for NRHP listing. Avoidance of known cultural resources sites would be taken into consideration when planning reasonably foreseeable future projects on the installation and within the surrounding area. However, if activities would be conducted adjacent to or could not be adjusted to avoid impacting an archaeological site, then consultation with the SHPO/tribal historic preservation officer would occur, and mitigation measures would be developed in accordance with Section 106 of the NHPA. Should an inadvertent discovery of cultural or human remains occur on JBSA-Randolph, all project activities would follow the procedures for inadvertent discoveries outlined in the installation's Integrated Cultural Resources Management Plan. No long-term, adverse cumulative impacts on cultural resources would be expected from increased aircraft operations from T-7A recapitalization or Foreign Military Sales beddown because aircraft operations do not have the potential to impact historic or cultural properties. The Texas Army National Guard consolidation is proposed to use existing facilities with some facility renovations at JBSA-Lackland but would not affect JBSA-Randolph facilities. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects (see **Table 4-1**), would not result in a significant cumulative impact on cultural resources.

Land Use. The past, present, and reasonably foreseeable military actions would generally be compatible with the JBSA Regional Compatible Use Plan. No land use effects would be anticipated from construction of the state and local actions. Without proper coordination and land use controls, private sector land development actions could have long-term, adverse impacts on mission compatibility and the safety and welfare of area residents. However, JBSA-San Antonio is continually working to strengthen working relationships with state and local governments and to implement procedures, policies, and tools to effectively reduce compatibility concerns. Periodic updates to RCUP, JLUS, AICUZ plans will continue to identify and establish

strategies for addressing land use compatibility. Enhanced use of programs to identify, fund, and implement actions (e.g., REPI) will also serve to address existing compatibility issues and proactively serve to avoid or minimize future concerns.

The projected housing in and around Seguin Texas as shown on the Seguin, Texas economic development website (https://www.seguinedc.com/life-in-seguin/housing) taken into consideration with the proposed T-7A recapitalization actions with mitigation actions to reduce power settings for aircraft flights, would not result in a significant cumulative impact on land use.

Hazardous Materials and Wastes. T-7A recapitalization at JBSA-Randolph and present and reasonably foreseeable actions on JBSA-Randolph, JBSA-Lackland, and Seguin AAF, and within the surrounding area would result in intermittent, short-term, temporary increases in the use of hazardous materials and petroleum products and generation of wastes. No impacts on JBSA's ERP or MMRP sites would occur from the Proposed Action; however, short-term, minor, adverse cumulative environmental contamination impacts could occur if any past, present, or reasonably foreseeable actions would coincide with active ERP sites. Environmental control measures outlined in **Section 3.6**, to include proper procurement, use, and disposal of hazardous materials in accordance with applicable regulations and approved plans would minimize impacts. If soil or groundwater that is believed to be contaminated is discovered on or off the installation, the contractor would immediately stop work; report the discovery to the appropriate installation, state, or county personnel; and implement applicable safety measures. Commencement of construction activities would not occur until the issue was investigated and resolved. The Proposed Action, as well as present and reasonably foreseeable future projects at JBSA-Randolph, JBSA-Lackland, and Seguin AAF, and within the surrounding area, would incorporate standard measures to limit or control hazardous materials and waste into their design and operation plans. Increased flight activities would occur at established locations in existing military operating areas. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on hazardous materials and wastes.

Infrastructure and Transportation. T-7A recapitalization at JBSA-Randolph and present and reasonably foreseeable actions on JBSA-Randolph, JBSA-Lackland, and Seguin AAF, and within the surrounding area have the potential to impact the following infrastructure: airfield, electrical distribution, natural gas supply, water supply, sanitary sewer and wastewater treatment, stormwater handling, communications, solid waste management, liquid fuels supply, and transportation. Short-term, minor, adverse cumulative impacts during construction would be anticipated from potential on- and off-installation service interruptions should utility lines need to be rerouted or when a new facility is connected to the distribution systems. Upgrade and construction of new infrastructure on and off the installation would result in long-term beneficial impacts from upgraded utility supply connections and communications systems, improved stormwater handling, and increased energy efficiency. Additionally, long-term, negligible to minor, adverse cumulative impacts on the infrastructure and transportation systems at JBSA-Randolph could occur if any past, present, or reasonably foreseeable action required the permanent addition of personnel at the installation. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on infrastructure.

Safety. T-7A recapitalization at JBSA-Randolph and reasonably foreseeable actions on JBSA-Randolph, JBSA-Lackland, and Seguin AAF, and within the surrounding area would result in short-term, minor, intermittent, adverse cumulative impacts on safety (e.g., slips, falls, heat exposure, and exposure to mechanical, electrical, vision, and chemical hazards) would occur from construction actions associated with the Proposed Action and reasonably foreseeable actions. Adherence to established procedures, including the use of PPE, fencing project areas and posting signs, and compliance with all federal, state, and DoD OSHA standards would reduce or eliminate health and safety impacts on contractors, military personnel, and the general public. These procedures are typical for construction projects on the installation and within the surrounding area. Implementation of the Proposed Action, Foreign Military Sales beddown, and the Texas Army National Guard consolidation would cumulatively increase aircraft operations at JBSA-Lackland, which would result in long-term, minor, adverse cumulative impacts on flight safety. Increased flight activities would occur at established locations in existing military operating areas and along established MTRs. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on health and safety.

Water Resources. T-7A recapitalization at JBSA-Randolph and reasonably foreseeable actions on JBSA-Randolph, JBSA-Lackland, and Seguin AAF, and within the surrounding area would result in short- and long-term, minor, adverse, cumulative impacts on water from construction involving ground disturbance and increased impervious surfaces. Soil disturbance could result in erosion, sedimentation, and degraded water quality. The cumulative increase in impervious surfaces from the Proposed Action and past, present, and reasonably foreseeable actions would be considered a minor contribution in the context of the whole watershed but could be noticeable on a local level. In accordance with federal and state stormwater regulations, the post-development hydrologic conditions of project areas must be maintained as they were during predevelopment. For these project areas, preservation of pre-development hydrologic condition would be ensured through utilization of existing stormwater management systems on the installation and adherence to SWPPPs, ESCPs, and incorporation of other BMPs as well as appropriate low-impact development strategies that would attenuate potentially long-term, adverse impacts on water resources.

Construction areas associated with the Proposed Action and present and reasonably foreseeable future projects on the installation and within the surrounding area would require all construction activities, regardless of size, to implement standard BMPs to ensure that stormwater pollutants are contained to the maximum extent practical and do not enter storm drainage systems. Coverage under the NPDES Construction General Permit would be required for all on- or off-installation construction activities over 1 acre as well as implementation of standard BMPs to minimize impacts from sedimentation on water quality and reduce soil erosion and stormwater runoff. Soil disturbance from construction and demolition activities have the potential to result in a minor disruption of natural drainage patterns, contamination of stormwater discharge, and heavy sediment loading. Development of new stormwater drainage systems and upgrade of existing systems would be designed with consideration for the UFC low impact development requirements, in accordance with Section 438 of EISA, to maintain or restore the natural hydrologic functions of the area.

Accidental spills or leaks of substances such as fuels, oils, and other lubricants could contaminate water resources. All equipment would be maintained according to manufacturer's specifications and all fuels and potentially hazardous materials would be contained and stored appropriately. The potential for contamination to occur would be minimized through the use of secondary containment for the temporary storage of any hazardous materials and other BMPs to prevent or minimize spills or leaks. The Proposed Action and projects presented in **Table 4-1** would be conducted in accordance with environmental considerations, including implementation of stormwater and erosion control as well as water conservation (e.g., using low flow toilets, etc.) measures. Therefore, the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact on water resources.

Environmental Justice. No disproportionately high and adverse health or environmental impacts on low-income or minority populations, and no disproportionate impacts on child or elderly populations are expected from the Proposed Action. Any cumulative environmental impacts from T-7A recapitalization and past, present, or reasonably foreseeable actions would be consistent across all populations and would not disproportionately impact environmental justice populations. Therefore, no short- or long-term, disproportionately high and adverse cumulative health or environmental impacts on minority, low-income, child, or elderly populations at JBSA-Randolph, Seguin AAF, JBSA-Lackland or within the surrounding area would occur.

4.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from the MILCON and FSRM projects under the Proposed Action. None of these impacts would be significant.

Biological Resources. Ground-disturbing activities associated with the MILCON and FSRM projects would result in the loss of vegetation and wildlife habitat. These losses would be unavoidable; however, temporarily disturbed sites would be revegetated with native species following construction to support the native plant community and restore wildlife habitat in the long term. Vegetation and wildlife habitat within the footprint of new construction would be permanently lost.

Energy. The MILCON and FSRM projects at JBSA-Randolph and increased aircraft operations at JBSA-Randolph, JBSA-Lackland, and Seguin AAF would require the use of fossil fuels, a non-renewable natural resource, during construction and demolition. The use of non-renewable resources is an unavoidable occurrence, although not considered significant.

Hazardous Materials and Wastes. The use and generation of hazardous materials and wastes during construction and demolition would be unavoidable; however, the hazardous materials and wastes would be handled in accordance with federal, state, and local policies and would not be expected to result in significant impacts.

4.3 Compatibility with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

The Proposed Action would occur on government-owned lands that DAF operates. The proposed construction and demolition and long-term operations associated with the Proposed Action would not differ from the current activities occurring at the installation. DAF would continue to follow all requirements related to installation development and would therefore be consistent with current federal, regional, state, and local land use policies and controls. The Proposed Action would not conflict with any applicable off-installation land-use ordinances and would follow all applicable permitting, building, and safety requirements. After the arrival of the T-7A aircraft at JBSA-Randolph and commencement of T-7A training operations, DAF would monitor aircraft noise and collect additional flight data to update the AICUZ study. Based on the results of the refined or validated projected noise footprints, DAF would coordinate with local county and city land use planners to update current planning documents.

4.4 Relationship between Short-Term Uses of the Human Environment and Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the biophysical components of the human environment include direct, project-related disturbances and direct impacts associated with an increase of population and activity that occurs over less than 5 years. Long-term uses of the human environment include those impacts occurring over more than 5 years, including permanent resource loss.

The MILCON and FSRM projects under the Proposed Action would not require short-term resource uses that would result in long-term compromises of productivity. Although implementation of installation development projects could result in an increase of impervious surface, it would not result in intensification of land use at JBSA-Randolph or within the surrounding area, as most projects would occur within previously developed or disturbed areas. Therefore, it is anticipated that the Proposed Action would not result in any adverse cumulative impacts on land use or aesthetics.

4.5 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the impacts that use of these resources would have on future generations. Irreversible impacts primarily result from use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe. The irreversible and irretrievable commitment of resources that would result from the Proposed Action involve the consumption of material resources used for construction, energy resources, biological resources, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources used for the Proposed Action would potentially include concrete and various construction materials and supplies. The materials that would be

consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources, including petroleum-based products (e.g., gasoline and diesel), used for the Proposed Action would be irretrievably lost. During construction and demolition, gasoline and diesel would be used for the operation of vehicles and construction and demolition equipment. Consumption of these energy resources would not place a significant demand on their availability in the region; therefore, less than significant impacts would be expected.

Biological Resources. The Proposed Action would result in a negligible loss of vegetation and wildlife habitat. Most of the losses would be lower quality vegetation and habitat on the airfield or in developed portions of the installation and would not include wetland, ponds at the golf course, or Woman Hollering Creek on JBSA-Randolph. Temporarily disturbed sites would be revegetated with native species to support the native plant community in the long term.

Human Resources. The use of human resources for construction and demolition is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

5. List of Preparers

This EIS has been prepared by HDR, Inc. (HDR) and its subcontractor LPES, Inc. under the direction of U.S. Army Corps of Engineers–Tulsa District, Air Force Civil Engineer Center, and the AETC staff. The individuals who contributed to the preparation of this document are listed below:

Kelly Albery, HDR
B.S. Wildlife Conservation and Management
Years of Experience: 9

Michelle Bare, HDR
General Studies
Years of Experience: 30

Jeanne Barnes, HDR
M.A. History
B.A. History
Years of Experience: 16

Stephanie Conner, HDR
B.S. Environmental Science & Policy
Years of Experience: 17

Timothy Didlake, HDR
B.S. Earth Sciences
Years of Experience: 13

Leesa Gratreak, HDR
M.S. Historic Preservation
B.A. Architectural History
Years of Experience: 10

Leigh Hagan, HDR
M.E.S.M. Environmental Science and Management
B.S. Biology
Years of Experience: 16

Carolyn Hein, HDR
B.S. Environmental Science
Years of Experience: 2

Russell Henning, PE, HDR
B.S. Mechanical Engineering
Years of Experience: 34

Christopher Holdridge, HDR
M.S. Environmental Sciences/Studies
B.S. Environmental Studies
Years of Experience: 23

Abbey Humphreys, HDR
M.S. Biology
B.S. Geospatial Science
B.S. Environmental Biology
Years of Experience: 4

Timothy Lavallee, PE, LPES, Inc.
M.S. Civil and Environmental Engineering
B.S. Mechanical Engineering
Years of Experience: 30

Christopher McJetters, HDR
B.S. English
Years of Experience: 10

Darrell Molzan, PE, HDR
B.S. Civil Engineering
Years of Experience: 38

Cheryl Myers, HDR
A.A.S. Nursing
Years of Experience: 24

Deborah Peer, HDR
M.S. Environmental Science and Management
B.S. Zoology
B.S. Wildlife Science
Years of Experience: 19

Stephen Pyle, JD, HDR
J.D. Environmental Law
B.S. Natural Resource Management
Years of Experience: 16

Craig Shirk, AICP, HDR
M.S. Environmental Sciences
B.A. Earth and Environmental Resource Management
Years of Experience: 27

Christy Smith, HDR
M.A. History
B.A. Anthropology
Years of Experience: 22

Logan Smith, HDR
B.A. Geography
Years of Experience: 2

Patrick Solomon, CEP, HDR
M.S. Geography
B.A. Geography
Years of Experience: 27

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