ENVIRONMENTAL ASSESSMENT

Addressing the

301st Fighter Wing Managed Airspace,

Naval Air Station Joint Reserve Base,

Fort Worth, Texas

Headquarters Air Force Reserve Command

May 2009

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14. ABSTRACT

The 301 FW proposes to continue to provide military airspace and training areas that would enable the 301 FW and other airspace users to accomplish required readiness training operations and ensure that mission capabilities are sustained. The need for the Proposed Action is military readiness and to facilitate the implementation of the 2005 Base Closure and Realignment Commission recommendations for the 2005 Base Realignment and Closure (BRAC) actions affecting NAS JRB Fort Worth and other airspace users. To accommodate the required training associated with airspace owned and operated by the 301 FW in Texas and Oklahoma, use of various Military Training Routes (MTRs) Military Operations Areas (MOAs), and the Falcon Bombing Range is assessed in this EA at new utilization levels. The MTRs include Instrument Routes (IRs), Visual Routes (VRs), and Slow Routes (SRs). This EA evaluates the potential environmental consequences of the Proposed Action and alternatives including the No Action Alternative, on the following 11 resource categories: airspace management and aircraft safety, noise, land use, air quality, biological resources, geological resources, water resources cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes.

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Attch 1

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ENVIRONMENTAL ASSESSMENT (EA) ADDRESSING THE 301ST FIGHTER WING (301 FW) MANAGED AIRSPACE, NAVAL AIR STATION JOINT RESERVE BASE (NAS JRB), FORT WORTH, TEXAS

Pursuant to the Council on Environmental Quality's (CEQ's) regulations for implementing procedural provisions of the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] 1500-1508), 32 CFR Part 989, and Department of Defense Directive 6050.1, the U.S. Air Force Reserve Command (AFRC) has prepared an Environmental Assessment (EA) addressing potential environmental consequences associated with aircraft operations in 301st Fighter Wing (301 FW) managed airspace in Texas and Oklahoma. The EA is incorporated by reference into this Finding of No Significant Impact (FONSI).

INTRODUCTION

The 301 FW is an AFRC unit located at Naval Air Station Joint Reserve Base (NAS JRB) Fort Worth, Texas. The installation's facilities are maintained by a joint U.S. Navy/301st FW Public Works unit. The 301 FW is focused on "training, mobilization, deployment, and employment." Part of the training component of the 301 FW's mission is to provide access to training airspace supporting NAS JRB Fort Worth based aircraft, as well as to accommodate pilot training requirements for the USAF and other services. Multiple units outside of NAS JRB Fort Worth use the airspace managed by the 301 FW. There have been recent Base Realignment and Closure (BRAC)-related changes for some of those users; and consequently, requirements for updating environmental documentation associated with the use of the airspace necessitate the preparation of the EA. To accommodate the required training associated with airspace managed by the 301 FW, use of various Military Training Routes (MTRs), Military Operations Areas (MOAs), and Falcon Bombing Range are assessed in the EA. The MTRs managed by the 301 FW include Instrument Route (IR)103, IR105, IR123, IR124, IR139, Visual Route (VR)104, VR1128, VR1137, VR143, VR186, VR118, VR1110, VR101, VR1124, Slow Route (SR)228, and SR270. The MOAs managed by the 301 FW include Brady North, Brady South Low, Brady South High, and Brownwood.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to continue to provide military airspace and training areas that would enable the 301 FW and other airspace users to accomplish required readiness training operations and ensure that mission capabilities are sustained. The need for the Proposed Action is military readiness and to facilitate the implementation of the BRAC Commission recommendations for the 2005 BRAC actions affecting NAS JRB Fort Worth and other airspace users. The U.S. Air Force (USAF) needs to ensure that the Commission's recommendations applicable to NAS JRB Fort Worth and other airspace users can be carried out in order to achieve the objectives for which Congress established the BRAC process.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Proposed Action. The Proposed Action is to continue readiness training operations in airspace components managed by the 301 FW to ensure users can continue to accomplish required mission readiness training requirements. This training would involve the continued use of the 301 FW managed airspace with annual operations to be assessed based on proposed increased utilization levels as provided in the EA. As described above, the 301 FW managed airspace includes 16 MTRs (5 IRs, 9 VRs, and 2 SRs), 4 MOAs, and Falcon Bombing Range.

No Action Alternative. Under the No Action Alternative, the Proposed Action would not be implemented. NAS JRB Fort Worth and other airspace users would continue to operate with the current inventory of aircraft and the number of aircraft operations would remain unchanged within the 301 FW managed airspace.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED ACTION

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, the evaluation of potential environmental impacts presented in the EA focuses on those resources and conditions potentially subject to effects and on potentially significant environmental issues deserving of study, and deemphasizes insignificant issues. Some environmental resources and conditions that are often analyzed in an EA were omitted from detailed analysis. Geological resources, water resources, cultural resources, socioeconomics and environmental justice issues, infrastructure, and hazardous materials and wastes were eliminated from detailed examination because of their inapplicability.

Based on the analyses addressing the Proposed Action presented in the EA, it was determined that no adverse effects would be expected on airspace management or land use as a result of the Proposed Action. The Proposed Action would not involve changes in land use and would not preclude the viability of existing land use. Minor adverse impacts on aircraft safety (long-term), the acoustical environment (long-term), air quality (long-term), and biological resources (short-term and potentially long-term) would be expected to continue under the Proposed Action. Minor adverse effects on these resource areas would be expected to continue because the 301 FW managed airspace is currently utilized at operation levels similar to the Proposed Action.

There would be no change in personnel or construction activities required as part of the Proposed Action. Implementation of the Proposed Action would not result in the need to reconfigure current military airspace, impose any major restrictions on air commerce opportunities, significantly limit airspace access to large numbers of users over current conditions, or require modifications to air traffic control systems.

CUMULATIVE IMPACTS

In addition to the annual operations assessed in the EA for the Proposed Action, a Forecasted Operations Scenario was also analyzed to account for future mission changes that could reasonably be expected. The forecasted operations presented in the EA include the operations shown as part of the Proposed Action. Cumulative impacts associated with the forecasted scenario are expected to be similar to the impacts associated with the Proposed Action.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

AFRC initiated the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process for the Proposed Action on 4 September 2008, in accordance with USAF policy. A 30-day public and agency review of the Description of Proposed Action and Alternatives for this EA was previously conducted. The Draft EA and FONSI were reviewed as part of the IICEP process, and comments received were considered in the analysis and included in appendices to the EA.

FINDING OF NO SIGNIFICANT IMPACT

I conclude that the environmental effects of the proposed airspace utilization levels for the 301 FW managed airspace are not significant, that preparation of an Environmental Impact Statement is unnecessary, and that a FONSI is appropriate. The preparation of the EA is in accordance with NEPA, CEQ regulations, and 32 CFR Part 989, as amended and is herein incorporated by reference.

21 May 09

RICHARD W. SCOBEE, Colonel, AFRC
Commander, 301st Fighter Wing

Date

Attachment: Environmental Assessment

ABBREVIATIONS AND ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
136 AW	136th Air Wing
301 FW	301st Fighter Wing
ACC	Air Combat Command
AFB	Air Force Base
AFI	Air Force Instruction
AFRC	Air Force Reserve Command
AGL	Above Ground Level
AGS	Air Guard Station
AHAS	Aviation Hazard Advisory System
ANG	Air National Guard
AQCR	Air Quality Control Region
ATC	Air Traffic Control
BAM	Bird Avoidance Model
BASH	Bird/Wildlife Aircraft Strike Hazard
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
dBA	A-weighted decibels
DNL	day-night average A-weighted sound level
DOD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FONSI	Finding of No Significant Impact
IERA	U.S. Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis
IFR	Instrument Flight Rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IMC	instrument meteorological conditions
IR	Instrument Route
JLUS	Joint Land Use Study
KIAS	knots indicated airspace
L_{dnmr}	onset rate-adjusted monthly day-night average
mg/m^3	milligrams per cubic meter
MOA	Military Operations Area
MR_NMAP	Military Operating Area and Range Noise Model

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MSL	Mean Sea Level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NAS JRB	Naval Air Station Joint Reserve Base
NEPA	National Environmental Policy Act
NM	nautical miles
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOTAM	Notice to Airmen
NVG	Night Vision Goggles
NWR	National Wildlife Refuge
O_3	ozone
ODEQ	Oklahoma Department of Environmental Quality
P.L.	Public Law
Pb	lead
PM_{10}	particulates equal to or less than 10 microns in diameter
$PM_{2.5}$	particulates equal to or less than 2.5 microns in diameter
ppm	parts per million
PSD	Prevention of Significant Deterioration
R	Restricted Area
ROI	Region of Influence
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	Slow Route
SUA	Special Use Airspace
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
U.S.C.	United States Code
USAF	United States Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VFR	Visual Flight Rules
VMC	visual meteorological conditions
VR	Visual Route

COVER SHEET

ENVIRONMENTAL ASSESSMENT ADDRESSING THE 301ST FIGHTER WING MANAGED AIRSPACE, NAVAL AIR STATION JOINT RESERVE BASE, FORT WORTH, TEXAS

Responsible Agencies: Air Force Reserve Command (AFRC), Air Force Center for Engineering and the Environment, and 301st Fighter Wing (301 FW), Naval Air Station Joint Reserve Base (NAS JRB), Fort Worth, Texas.

Affected Location: 301 FW managed airspace in Texas and Oklahoma.

Report Designation: Environmental Assessment (EA).

Abstract: The 301 FW proposes to continue to provide military airspace and training areas that would enable the 301 FW and other airspace users to accomplish required readiness training operations and ensure that mission capabilities are sustained. The need for the Proposed Action is military readiness and to facilitate the implementation of the 2005 Base Closure and Realignment Commission recommendations for the 2005 Base Realignment and Closure (BRAC) actions affecting NAS JRB Fort Worth and other airspace users. To accommodate the required training associated with airspace owned and operated by the 301 FW in Texas and Oklahoma, use of various Military Training Routes (MTRs), Military Operations Areas (MOAs), and the Falcon Bombing Range is assessed in this EA at new utilization levels. The MTRs include Instrument Routes (IRs), Visual Routes (VRs), and Slow Routes (SRs).

This EA evaluates the potential environmental consequences of the Proposed Action and alternatives, including the No Action Alternative, on the following 11 resource categories: airspace management and aircraft safety, noise, land use, air quality, biological resources, geological resources, water resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes.

Privacy Advisory

Your comments on this document are requested. Letters or other written or oral comments provided may be published in the EA. As required by law, comments will be addressed in the EA and made available to the public. Any personal information provided will be used only to identify your desire to comment on this document or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and the specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

ENVIRONMENTAL ASSESSMENT
ADDRESSING THE
301ST FIGHTER WING MANAGED AIRSPACE,
NAVAL AIR STATION JOINT RESERVE BASE,
FORT WORTH, TEXAS

Headquarters Air Force Reserve Command
Strategic Planning Branch
255 Richard Ray Boulevard
Robins Air Force Base, Georgia 31098-1637

MAY 2009

EXECUTIVE SUMMARY

Introduction

The 301st Fighter Wing (301 FW) is an Air Force Reserve Command (AFRC) unit located at Naval Air Station Joint Reserve Base (NAS JRB) Fort Worth, Texas. The installation's facilities are maintained by a joint U.S. Navy/301 FW Public Works unit. The 301 FW is focused on "training, mobilization, deployment, and employment." Part of the training component of the 301 FW's mission is to provide access to training airspace supporting NAS JRB Fort Worth based aircraft, as well as to accommodate pilot training requirements for the USAF and other services. Multiple units outside of NAS JRB Fort Worth use the airspace managed by the 301 FW. There have been recent Base Realignment and Closure (BRAC)-related changes for some of those users; and consequently, requirements for updating environmental documentation associated with the use of the airspace necessitate the preparation of this Environmental Assessment (EA). To accommodate the required training associated with airspace managed by the 301 FW, use of various Military Training Routes (MTRs), Military Operations Areas (MOAs), and the Falcon Bombing Range are assessed in this EA. The MTRs managed by the 301 FW include Instrument Route (IR)103, IR105, IR123, IR124, IR139, Visual Route (VR)104, VR1128, VR1137, VR143, VR186, VR118, VR1110, VR101, VR1124, Slow Route (SR)228, and SR270. The MOAs managed by the 301 FW include Brady North, Brady South Low, Brady South High, and Brownwood.

Purpose and Need

The purpose of the Proposed Action is to continue to provide military airspace and training areas that would enable the 301 FW and other airspace users to accomplish required readiness training operations and ensure that mission capabilities are sustained. The need for the Proposed Action is military readiness and to facilitate the implementation of the BRAC Commission recommendations for the 2005 BRAC actions affecting NAS JRB Fort Worth and other airspace users. The U.S. Air Force (USAF) needs to ensure that the Commission's recommendations applicable to NAS JRB Fort Worth and other airspace users can be carried out in order to achieve the objectives for which Congress established the BRAC process.

This 2009 EA addresses potential environmental consequences associated with the Proposed Action and reasonable alternatives to the Proposed Action. BRAC 2005 actions affecting facilities, functions, and personnel at NAS JRB Fort Worth were assessed in a November 2006 EA entitled, *Environmental Assessment for the Implementation of Base Realignment and Closure (BRAC) 2005 Action at Naval Air Station, Joint Reserve Base, Fort Worth, Texas*. The 2006 EA, therefore, is incorporated by reference into this 2009 EA. Baseline conditions in this 2009 EA represent pre-BRAC 2005 conditions.

Summary of the Proposed Action and Alternatives

Proposed Action. The Proposed Action (which represents post BRAC 2005 conditions) is to continue readiness training operations in airspace components managed by the 301 FW to ensure users can continue to accomplish required mission readiness training requirements. This training would involve the continued use of the 301 FW managed airspace at increased utilization levels. As described above, the 301 FW managed airspace includes 16 MTRs (5 IRs, 9 VRs, and 2 SRs), 4 MOAs, and the Falcon Bombing Range. There would be no change in personnel or construction activities required as part of the Proposed Action. The Region of Influence (ROI) for this EA includes the military airspace managed by the 301 FW and the land areas directly underneath that airspace.

Total airspace operations associated with 301 FW managed airspace are proposed to increase by approximately 21 percent, from a baseline of 14,861 annual operations to 17,931 annual operations under the Proposed Action. However, this increase is spread over a very large area, which includes 16 MTRs, 4 MOAs, and a Restricted Area associated with the Falcon Bombing Range. The percent increase in operations varies by airspace area.

No Action Alternative. Under the No Action Alternative, the Proposed Action would not be implemented. NAS JRB Fort Worth and other airspace users would continue to operate with the current inventory of aircraft and the number of aircraft operations would remain unchanged within the 301 FW managed airspace.

Summary of Environmental Consequences

This EA contains a comprehensive evaluation of the existing conditions and environmental consequences of the Proposed Action and the No Action Alternative, as required by the National Environmental Policy Act of 1969 (NEPA). In compliance with NEPA, Council on Environmental Quality (CEQ) guidelines, and 32 Code of Federal Regulations (CFR) Part 989, the evaluation of potential environmental impacts presented in the EA focuses on those resources and conditions potentially subject to effects and on potentially significant environmental issues deserving of study, and deemphasizes insignificant issues. Some environmental resources and conditions that are often analyzed in an EA were omitted from detailed analysis. Geological resources, water resources, cultural resources, socioeconomics and environmental justice issues, infrastructure, and hazardous materials and wastes were eliminated from detailed examination because of their inapplicability.

Potential environmental impacts based on the analyses addressing the Proposed Action presented in the EA are summarized in the following text by resource area. **Section 3** of this EA addresses these impacts in more detail.

Airspace Management and Aircraft Safety. There would be no significant, adverse effects pertaining to management of the airspace under the Proposed Action due to the fact that no new airspace is proposed. Implementation of the Proposed Action would not result in the need to reconfigure current military airspace, impose any major restrictions on air commerce opportunities, significantly limit airspace access to large numbers of users over current conditions, or require modifications to air traffic control systems. Long-term minor adverse impacts on aircraft safety due to aircraft mishaps, "lights-out" training utilizing Night Vision Goggles, and Bird/Wildlife Aircraft Strike Hazards would be expected as a result of the Proposed Action.

Noise. Long-term intermittent minor adverse impacts on the acoustical environment would be expected to continue as a result of the aircraft noise associated with the Proposed Action. Long-term intermittent minor adverse impacts on the acoustical environment exist because the airspace managed by the 301 FW is currently in use, therefore intermittent aircraft overflights are already occurring. Under the Proposed Action, none of the noise levels for the 301 FW managed airspace would exceed the onset rate-adjusted monthly day-night average (L_{dnmr}) sound level of 65 decibels that is the benchmark for land use planning.

Land Use. The Proposed Action would not involve changes in land use and would not preclude the viability of existing land use. There would not be an increase in estimated L_{dnmr} sound levels greater than 65 decibels from aircraft operations in any of the airspace analyzed for the 301 FW. As a result, the Proposed Action would not be incompatible with the existing land use.

Air Quality. Long-term minor adverse impacts on local air quality would be expected to continue as a result of the aircraft emissions associated with the Proposed Action. The Federal *de minimis* threshold

emissions rates were established by the U.S. Environmental Protection Agency in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. *De minimis* thresholds vary depending on the severity of the nonattainment area classification. With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 Code of Federal Regulations 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. As shown in this EA, emissions from the Proposed Action would not exceed the *de minimis* thresholds for the Metropolitan Dallas-Fort Worth Intrastate Air Quality Control Region and would be less than 10 percent of the emissions inventory for the ROI.

Biological Resources. Short-term and potentially long-term minor to moderate direct adverse effects on wildlife would be expected to continue as a result of the aircraft operations associated with the Proposed Action. Minor adverse effects on wildlife would be expected to continue because the 301 FW managed airspace is currently utilized at operation levels similar to the Proposed Action. Short-term minor, direct, adverse effects on birds and mammals would be expected as a result of noise disturbances from aircraft operations. Direct short-term and potentially long-term negligible to minor adverse impacts on birds and bats would be expected to continue as a result of bird and bat strikes from increased aircraft operations, particularly low-flying aircraft. Potentially long-term minor to moderate direct adverse impacts on birds and bats would be expected if strikes involve threatened or endangered species. Bird strike data from the 301 FW does not indicate that threatened or endangered species have been struck by aircraft within the ROI; therefore, the likelihood of a bird/wildlife aircraft strike with a threatened or endangered species appears to be very low.

Cumulative Impacts

In addition to the annual operations assessed in the EA for the Proposed Action, a Forecasted Operations Scenario was also analyzed to account for future mission changes that could reasonably be expected. The forecasted operations presented in the EA include the operations shown as part of the Proposed Action. Implementation of the forecasted scenario would increase the total number of annual operations flown by approximately 43 percent from the annual operations under the Proposed Action, and approximately 73 percent from baseline annual operations. Cumulative impacts associated with the forecasted scenario are expected to be similar to the impacts associated with the Proposed Action.

Conclusion/Recommendation

Based upon the findings of this EA, implementation of the Proposed Action would not have a significant adverse direct, indirect, or cumulative impact on the quality of the human or natural environment in the military airspace managed by the 301 FW and the land areas directly underneath that airspace.

Based upon the analysis of potential impacts, it has been determined that the Proposed Action does not constitute a major Federal action affecting the quality of human health or the environment. Because there would be no significant impact resulting from the implementation of the Proposed Action, a Finding of No Significant Impact (FONSI) has been prepared to accompany this EA and concludes that an Environmental Impact Statement (EIS) is not required for this action.

Public Review and Interagency Coordination

The NEPA process is designed to inform the public of the potential environmental consequences of the Proposed Action and involve them in the Federal decisionmaking process. The USAF recognizes public involvement and intergovernmental coordination and consultation as essential elements in developing an EA. Agencies, organizations, and members of the public having a potential interest in the Proposed Action are invited to participate in the decisionmaking process through their comments on this EA. Agency consultation letters were sent to the addresses shown on the distribution list provided as part of **Appendix C**.

The EA and FONSI were available to the public for comment for a period of 30 days, from 27 March to 26 April 2009. At the end of the 30-day period, the USAF considered all comments submitted by individuals, agencies, and organizations (see **Appendix D**). Because there would be no significant impact resulting from the implementation of the Proposed Action, a FONSI has been prepared to accompany this EA and concludes that an EIS is not required for this action. Upon execution of the FONSI, the USAF can proceed with implementing the Proposed Action.

ENVIRONMENTAL ASSESSMENT ADDRESSING THE 301ST FIGHTER WING MANAGED AIRSPACE, NAVAL AIR STATION JOINT RESERVE BASE, FORT WORTH, TEXAS

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1. PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Background

The 301st Fighter Wing (301 FW) manages various airspace and range assets used by military aircraft in specific areas of Texas and Oklahoma (see **Figure 1-1**). The 301 FW is an Air Force Reserve Command (AFRC) unit located at Naval Air Station Joint Reserve Base (NAS JRB) Fort Worth, Texas. The 301 FW is based at NAS JRB Fort Worth; the installation's facilities are maintained by a joint U.S. Navy/301st FW Public Works unit.

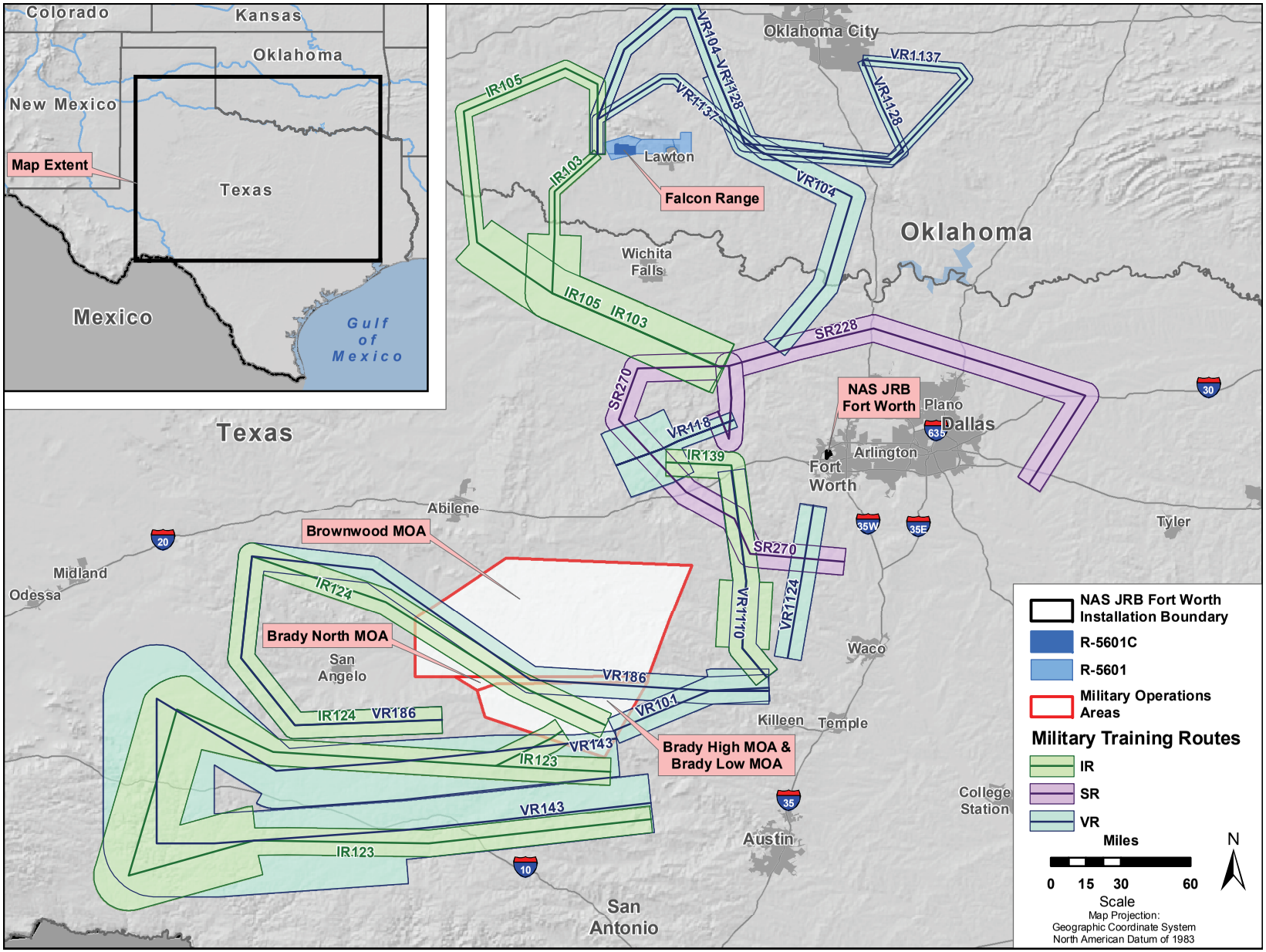
The mission of the 301 FW is to "provide Commanders in Chief and Major Commands with the combat ready warriors they need to operate our Expeditionary Air Force, fight and win America's wars, and protect our worldwide interests." The 301 FW is focused on "training, mobilization, deployment, and employment." Part of the training component of the 301 FW's mission is to provide access to training airspace supporting NAS JRB Fort Worth-based aircraft, as well as to accommodate pilot training requirements for the USAF and other services. Multiple units outside of NAS JRB Fort Worth use the airspace owned/scheduled by the 301 FW (e.g., F-16 aircraft from the Tulsa Oklahoma Air National Guard [ANG], B-52 aircraft from Barksdale Air Force Base [AFB], AT-38 aircraft from Sheppard AFB, B-2 aircraft from Whiteman AFB, U.S. Navy/U.S. Marine Corps F-18 aircraft, Canadian jets supporting Tactical Air Control Parties, and other transient aircraft including helicopters). There have been recent Base Realignment and Closure-(BRAC) related changes for some of those users and, consequently, requirements for updating environmental documentation for the use of the airspace necessitate the preparation of this Environmental Assessment (EA). This EA expands existing environmental information on continued operations of 301 FW managed airspace and assesses the potential impacts associated with using existing training airspace and other training assets.

NAS JRB Fort Worth encompasses 1,805 acres, and is approximately 7.5 miles northwest of downtown Fort Worth in Tarrant County, Texas. NAS JRB Fort Worth, formerly Carswell AFB, was established in 1994 as the first Joint Reserve Base in the country. More than 10,000 personnel are currently stationed at NAS JRB Fort Worth. The mission of NAS JRB Fort Worth is to provide a high-quality training environment for active-duty and Reserve components of all branches of the Armed Services and to reduce redundancy and overhead by developing joint doctrine and operating procedures that create seamless functionality amongst host and tenant commands in base support and community service programs.

NAS JRB Fort Worth is the headquarters for the 10th Air Force, the 301 FW, the 14th Marine Regiment, the 136th Airlift Wing (136 AW) of the Texas ANG, and Marine Fight Attack Squadron 112. Between the various units at NAS JRB Fort Worth, a combination of F-16, F-18, C-40, C-12, C-130, and C-9 aircraft are flown.

In its 2005 BRAC cycle, the BRAC Commission recommended the following:

- The closure of Naval Air Station Atlanta and the realignment of Atlanta's aircraft and personnel to various Air Stations, including NAS JRB Fort Worth
- That the 8th Marine Corps District be moved to NAS JRB Fort Worth
- The consolidation of Navy Reserve Readiness Command Midwest with the Navy Reserve Readiness Command South at NAS JRB Fort Worth



Source of Military Training Routes, MOAs, and R5601: AVDAFIF Edition 8, September 2008. Source of NAS JRB Ft. Worth Boundary: e²M, Inc. 2008

Figure 1-1. Airspace and Range Assets Managed by the 301 FW

- The realignment of Will Rogers Air Guard Station (AGS) and distributing a portion of the 137th Airlift Wing's C-130H aircraft to the 136 AW at NAS JRB Fort Worth
- Realigning the Nashville International Airport Aviation Ground Support Aeromedical Squadron to NAS JRB Fort Worth.

To accommodate the required training associated with airspace owned and operated by the 301 FW, use of various Military Training Routes (MTRs), Military Operations Areas (MOAs), and the Falcon Bombing Range (hereafter referred to as Falcon Range) are assessed in this EA for the airspace presented in **Table 1-1** at new utilization levels. The MTRs include Instrument Routes (IRs), Visual Routes (VRs), and Slow Routes (SRs). Maps and airspace coordinates associated with the locations of each of the various training areas and routes listed in **Table 1-1** can be found in **Appendix A**. There would be no personnel changes or construction activities required as part of the Proposed Action.

Table 1-1. Airspace Managed by the 301 FW

Military Training Routes (MTRs)		
IR103	VR104	SR228
IR105	VR1128	SR270
IR123	VR1137	
IR124	VR143	
IR139	VR186	
	VR118	
	VR1110	
	VR101	
	VR1124	
Military Operations Areas (MOAs)		
Brady North	Brady South Low	Brady South High
Brownwood		
Bombing Range		
Falcon Range		

This EA addresses potential environmental consequences associated with the Proposed Action and reasonable alternatives to the Proposed Action. Details on the Proposed Action are presented in **Section 2**. BRAC 2005 actions affecting facilities, functions, and personnel at NAS JRB Fort Worth were assessed in a November 2006 EA entitled, *Environmental Assessment for the Implementation of Base Realignment and Closure (BRAC) 2005 Action at Naval Air Station, Joint Reserve Base, Fort Worth, Texas* (NAS JRB 2006). The aforementioned EA, therefore, is incorporated by reference into this EA.

If the analyses presented in the EA were to indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents the reasons why a Proposed Action would not have a significant impact on the human environment and explains that the preparation of an Environmental Impact Statement (EIS) would not be required (also see **Section 1.3.1**). If significant environmental issues were to be identified that cannot be mitigated to insignificant levels, an EIS would be prepared or the Proposed Action would be abandoned and no action taken. Based on the analysis presented in this EA, there would be no significant impact resulting from the implementation of the

Proposed Action; therefore, a FONSI has been prepared to accompany this EA and concludes that an EIS is not required for this action. Upon execution of the FONSI, the USAF can proceed with implementing the Proposed Action.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to continue to provide military airspace and training areas that would enable the 301 FW and other airspace users to accomplish required readiness training operations and ensure that mission capabilities are sustained.

The need for the Proposed Action is military readiness and to facilitate the implementation of the 2005 BRAC Commission recommendations for the 2005 BRAC actions affecting NAS JRB Fort Worth and other airspace users. The Proposed Action is needed to comply with the Base Closure and Realignment Act of 1990 and to continue to ensure the Nation's ability to respond rapidly to the geopolitical challenges of the 21st century. In previous rounds of BRAC, the explicit goal was to save money and downsize the military to reap a "peace dividend." In the 2005 BRAC cycle, the Department of Defense (DOD) and the United States Air Force (USAF) sought to reorganize its installation infrastructure to more efficiently support forces, increase operational readiness, and facilitate new ways of doing business. Thus, BRAC supports advancing the goals of transformation, improving military capabilities, and enhancing military value. The USAF needs to ensure that the Commission's recommendations applicable to NAS JRB Fort Worth and other airspace users can be carried out in order to achieve the objectives for which Congress established the BRAC process.

1.3 Summary of Key Environmental Compliance Requirements

1.3.1 National Environmental Policy Act

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

The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a FONSI or whether the preparation of an EIS is necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

Air Force Policy Directive 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's

implementing regulation for NEPA is its *Environmental Impact Analysis Process* that is detailed in 32 CFR Part 989, as amended.

1.3.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with a Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

This EA examines the potential effects of the Proposed Action and alternatives on the following 11 resource categories:

- Airspace management and aircraft safety
- Noise
- Land use
- Air quality
- Biological resources
- Geological resources
- Water resources
- Cultural resources
- Socioeconomics and environmental justice
- Infrastructure
- Hazardous materials and wastes.

These resource categories were identified as being potentially affected by the Proposed Action and include applicable critical elements of the human environment whose review is mandated by Executive Order (EO), regulation, or policy.

Appendix B contains examples of relevant laws, regulations, and other requirements that are often considered part of the analysis. Only those laws, regulations, or other requirements relevant to resource categories analyzed in this EA are included in **Appendix B**. In addition, Federal, state, and local permits could be required for construction activities. This EA is not a substitute for those permit requirements.

1.4 Interagency Coordination and Public Involvement

The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs,* require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* (IICEP), requires the USAF, and thus AFRC, to implement the IICEP process, which is used for the purpose of agency coordination and implements scoping requirements (i.e., to determine the scope of issues to be addressed in detail in the EA). Through the IICEP process, the USAF notifies relevant Federal, state, and local agencies of the Proposed Action and alternatives and provides them sufficient time to make known their environmental concerns specific to the Proposed Action. IICEP materials are provided in **Appendix C**.

NEPA requirements also help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if Federal proponents of an action provide information to state and local governments and the public and involve them in the planning process. CEQ guidance in 40 CFR 1501.7 specifically states, "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 proposed actions. This process shall be termed scoping." The public involvement process augments the USAF opportunity to cooperate with and consider state and local views in implementing a Federal proposal.

Through the IICEP process, NAS JRB Fort Worth notified relevant Federal, state, and local agencies of the Proposed Action and requested input regarding environmental concerns they might have regarding the Proposed Action. The public involvement process provides NAS JRB Fort Worth with the opportunity to cooperate with and consider state and local views in its decision regarding implementation of this Federal proposal. As a part of the process, NAS JRB Fort Worth coordinated with the U.S. Environmental Protection Agency (USEPA); U.S. Fish and Wildlife Service (USFWS); Texas State Historic Preservation Office (SHPO); and other Federal, state, and local agencies (see **Appendix C**). Input from agency responses was incorporated into the analysis of potential environmental impacts.

A Notice of Availability (NOA) for this EA and proposed FONSI were published in newspapers local to Brownwood, Texas and Lawton, Oklahoma (the *Brownwood Bulletin* and the *Lawton Constitution*, respectively). The published NOA solicits comments on the Proposed Action and is intended to involve the local community in the decisionmaking process. Copies of the EA and proposed FONSI were available for review at the Fort Worth Central Public Library, Texas; Brownwood Public Library, Texas; F.M. Richards Memorial Library, Texas; Tom Green County Main Library, Texas; Killeen City Main Library, Texas; and Lawton Library, Oklahoma. Comments received from the public and other Federal, state, and local agencies were addressed in this EA and are included in **Appendix D**.

1.5 Organization of the EA

This EA is organized into six sections. **Section 1** contains background information on NAS JRB Fort Worth, a statement of the purpose of and need for the Proposed Action, a summary of applicable regulatory requirements, a discussion of agency coordination and public involvement, and an introduction to the organization of the EA. **Section 2** provides a detailed description of the Proposed Action and a discussion of the alternatives considered, including the No Action Alternative; and a description of the decision to be made and identification of the preferred alternative. **Section 3** contains a characterization of the affected environment, or baseline environmental conditions, and addresses potential environmental consequences associated with the Proposed Action and No Action Alternative. **Section 4** provides an analysis of the potential cumulative and other impacts. **Section 5** presents the preparers of the document. **Section 6** lists the reference documents used in the preparation of this EA. Various appendices support this EA and provide additional data and information.

2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section provides detailed information on the Proposed Action and alternatives that have been considered in the preparation of this EA.

2.1 Detailed Description of the Proposed Action

The Proposed Action is to continue readiness training operations in airspace components owned and managed by the 301 FW to ensure users can continue to accomplish required mission readiness training requirements. This training would involve the continued use of the 301 FW managed airspace, including MTRs, MOAs, and Falcon Range, with annual operations to be assessed based on the utilization levels listed in **Table 2-1**. For the purposes of this analysis, a Forecasted Operations Scenario (hereafter referred to as "forecasted") is also included to account for future mission changes that could be reasonably be expected. The forecasted operations presented in **Table 2-1** include the operations shown as part of the Proposed Action. Potential impacts associated with the forecasted operations are analyzed in the cumulative impacts section of each resource area in **Section 3**. Additional information on the breakdown of annual operations by aircraft type is also presented in **Appendix A**.

Table 2-1. Summary of Annual Operations Associated with 301 FW Managed Airspace

Airspace Component	Baseline (Pre-BRAC)	Proposed Action (Post-BRAC)	Forecasted
VR101	1	20	77
VR104	25	48	108
VR118	995	1,026	1,217
VR143	373	428	580
VR186	2,145	2,637	2,680
VR1110	18	35	67
VR1124	4	13	29
VR1128	13	25	46
VR1137	13	25	46
IR103	548	717	764
IR105	46	103	140
IR123	373	428	580
IR124	2,415	2,637	2,680
IR139	18	39	54
SR228	42	53	57
SR270	42	53	55
Brady North MOA	648	870	2,792
Brady South Low MOA	1,538	1,688	2,157
Brady South High MOA	2,788	3,485	5,128
Brownwood MOA	673	948	2,930
Falcon Range (R-5601C/D/E)	2,143	2,653	3,532
Total	**14,861**	**17,931**	**25,719**

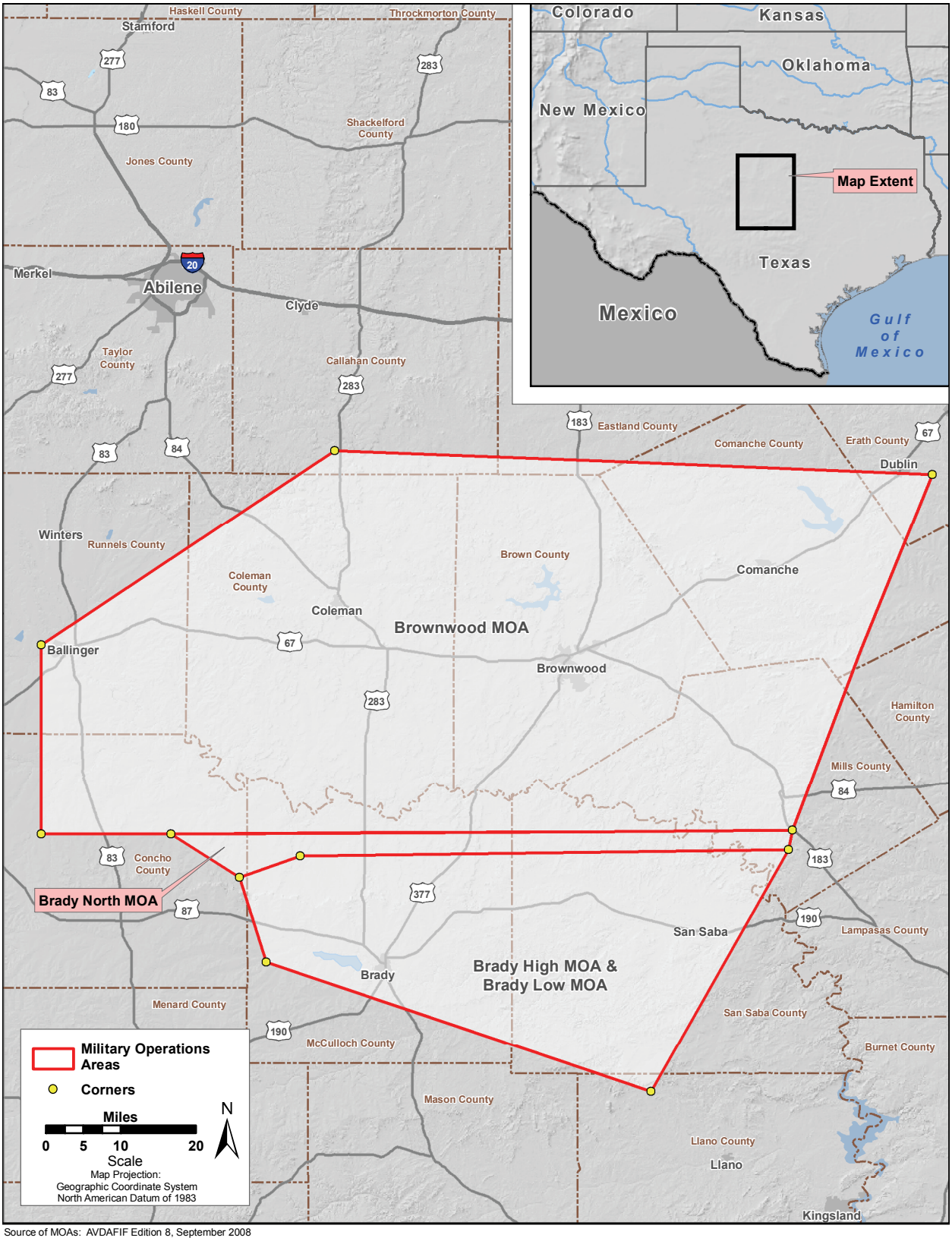
Airspace is defined as the space that lies above a nation and comes under its jurisdiction. Although it is generally viewed as being unlimited, airspace is a finite resource that can be defined vertically and horizontally, as well as temporally, when describing its use for aviation purposes. Under Public Law (P.L.) 85-725, the Federal Aviation Administration (FAA) is charged with the safe and efficient use of the nation's airspace and has therefore established certain criteria and limits for its use. In order to accomplish its task, the FAA utilizes the National Airspace System (NAS). Part of the NAS includes Special Use Airspace (SUA). SUA consists of airspace where activities must be confined because of their nature, or where limitations are imposed upon aircraft operations that are not a part of those activities, or both. Except for controlled firing areas, SUA areas are depicted on aeronautical charts. All SUA descriptions are contained in FAA Order 7400.8, *Special Use Airspace* (USDOT 2007).

The 301 FW manages numerous MTRs (see **Tables 1-1** and **2-1**). MTRs are flight corridors dedicated to low-level flight operations (i.e., typically below 10,000 feet above mean sea level [MSL]) that can exceed 250 knots indicated airspace (KIAS). MTRs include three types and are identified as either an IR, VR, or SR followed by a numerical designation. IR denotes instrument flight rules (IFR) apply along the route, whereas VR denotes visual flight rules (VFR) apply. An SR is a flight corridor for aircraft operating below 250 KIAS. Training is conducted from 100 feet above ground level (AGL) to 15,500 feet MSL, at speeds up to 600 KIAS for fighter-type aircraft and 240 KIAS for trainer aircraft. Military pilots use the routes to maintain proficiency by simulating wartime missions. Actual wartime missions require aircraft to accomplish high-speed low-level penetrations into enemy airspace in order to avoid detection.

The 301 FW manages the Brownwood and Brady MOAs (see **Figures 1-1** and **2-1**). MOAs are areas that consist of airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. There is no restriction against a pilot operating under VFR in these areas; however, a pilot should be alert since training activities could include acrobatic and abrupt maneuvers.

Training in the Brownwood and Brady MOAs could involve the use of chaff and flares. Such combat-condition training is necessary to simulate and respond to ground-based and aircraft threats. In addition, aircrews can perform "lights-out" training utilizing night vision goggles (NVG). In July 2001, the USAF filed a petition with the Department of Transportation seeking relief from the requirements of 14 CFR 91.209(a)(1) and (b). With this petition, the USAF wished to conduct certain night flight military training operations for various aircraft without lighted aircraft position lights. In January 2003, the USAF was granted an exemption (No. 7960) by the FAA for such training in select MOAs. The Brownwood MOA is included on the list of MOAs available for the lights-out activity. In July 2006, the FAA granted the USAF an extension to exemption No. 7960 until 31 January 2009. The extension also granted the USAF permission to include participation of aircraft from other military services while conducting joint operations (AOPA 2007). A request to include Brady North, Brady South Low, and Brady South High MOAs on the list of MOAs available for the lights-out activity is currently pending with the FAA, it is anticipated that the three MOAs will be added to the list in September 2009 (Queretaro 2009a).

A Restricted Area is present in the airspace associated with Falcon Range (see **Figure 2-2**) and is designated as R-5601. Restricted areas constitute airspace within which flight of aircraft, while not wholly prohibited, is subject to restrictions. Restricted airspaces are needed when the designated airspace can contain hazardous military activities including live firing of weapons, ordnance delivery, or aircraft testing. Most restricted areas (including R-5601) have specific hours of operations, and users must have permission from the controlling agency before flight through the defined areas.



Source of MOAs: AVDAFIF Edition 8, September 2008

Figure 2-1. Brownwood and Brady MOAs

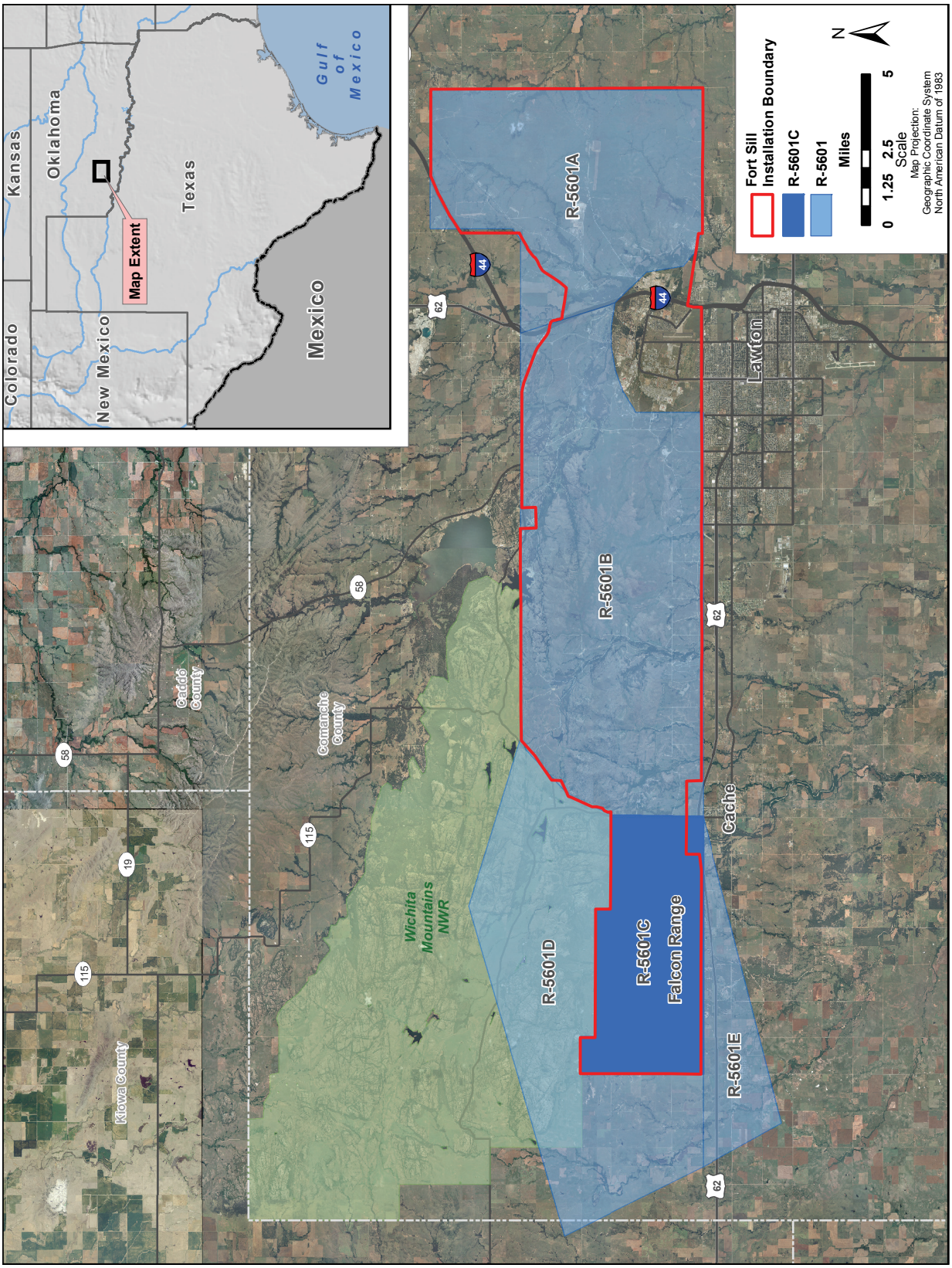


Figure 2-2. R-5601 and Falcon Range

A detailed description and map of each airspace component addressed in this EA is included in **Appendix A**. The Special Operating Procedures for the MTRs are provided in the DOD publication entitled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008). **Figures 2-3** and **2-4** are included to illustrate the three-dimensional nature of the Brady MOA and Brownwood MOA and R-5601, respectively. As depicted in **Figure 2-3**, the Brownwood MOA is a complex of six MOAs (Brownwood 1 East and West, Brownwood 2 East and West, Brownwood 3, and Brownwood 4). For the purposes of this EA the entire complex is referred to as the Brownwood MOA.

2.2 Alternatives to the Proposed Action

2.2.1 Introduction

Under NEPA, reasonable alternatives to the Proposed Action must be considered in the EA. Considering alternatives helps to avoid unnecessary impacts and allows an analysis of reasonable ways to achieve the stated purpose. To be considered reasonable, and thus warrant detailed evaluation, an alternative must be "ripe" for decisionmaking (i.e., any necessary preceding events having taken place), affordable, capable of implementation, and satisfactory with respect to meeting the purpose of and the need for the action. The following discussion identifies alternatives considered by the USAF and identifies whether they are reasonable and, hence, subject to further detailed evaluation in the EA.

2.2.2 Alternatives for Reassignment of Aircraft

Through the Defense Base Closure and Realignment Act of 1990, Congress directed the BRAC Commission to recommend the closure and realignment of military installations based on specified evaluation criteria. During 2005, the BRAC Commission carried out its function, resulting in its recommendations becoming law on 9 November 2005. For NAS JRB Fort Worth, this alternative is not ripe for decisionmaking because the 301 FW has no ability to reassign aircraft either at NAS JRB or at the other installations that are users of the 301 FW airspace; therefore, this alternative is not capable of implementation. Accordingly, alternatives for reassignment of aircraft are neither developed nor evaluated in detail in this EA, with the exception of the No Action Alternative.

2.2.3 Reduce Training Requirement Alternative

Regulations require USAF military flying units to maintain specified high standards through readiness training so they are able to respond to mission requirement when called upon to do so. Reducing training requirements would limit the USAF's ability to defend national security interests. Therefore, this alternative is not a viable option and is not carried forward for further detailed analysis in this EA.

2.2.4 Replace Flight Training with Simulator Training Alternative

Simulator training is a valuable training tool for preliminary training activity, especially during initial aircrew qualification training. Simulators are also used for continuation training for various procedures, including emergency training and instrument refresher courses. However, the dynamics of weather, the three-dimensional environment in flight, G-forces, and many other flight conditions can only be experienced in actual flight. Therefore, this alternative is not considered a viable alternative to the Proposed Action and is not carried forward for further detailed analysis in this EA.

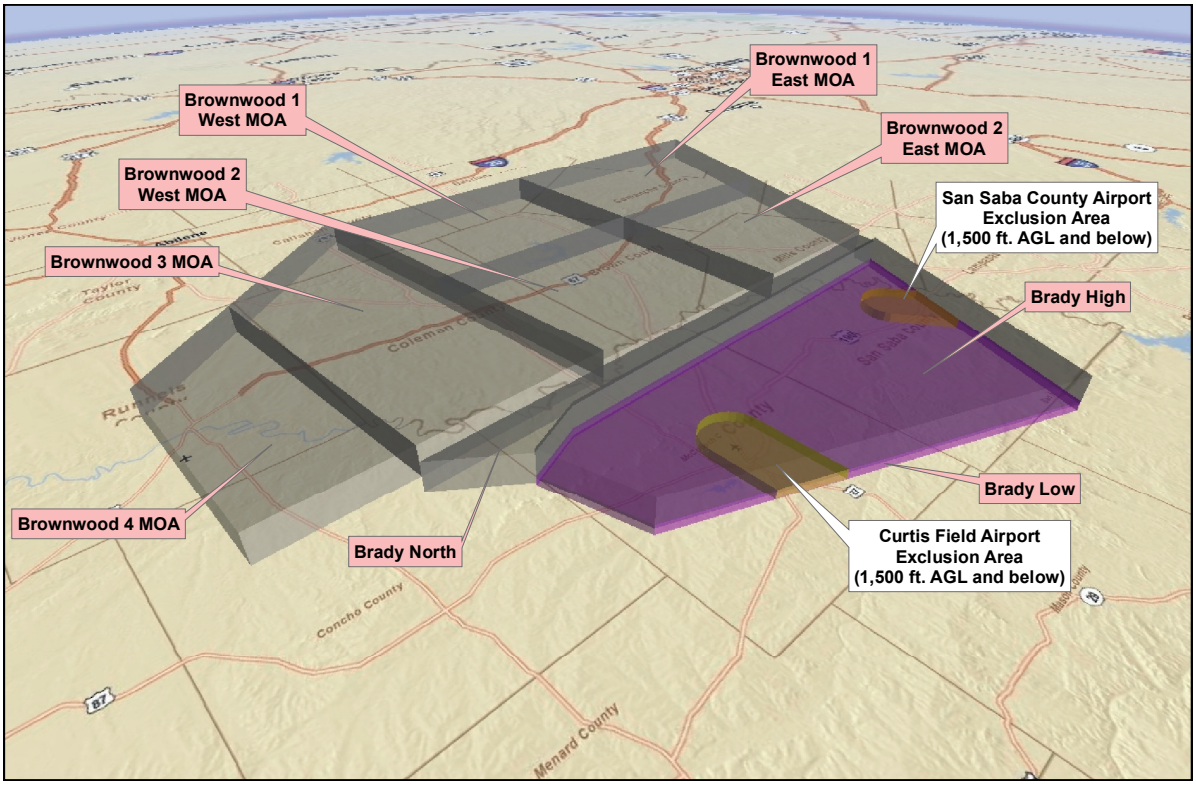


Figure 2-3. Three-Dimensional View of Brownwood and Brady MOAs

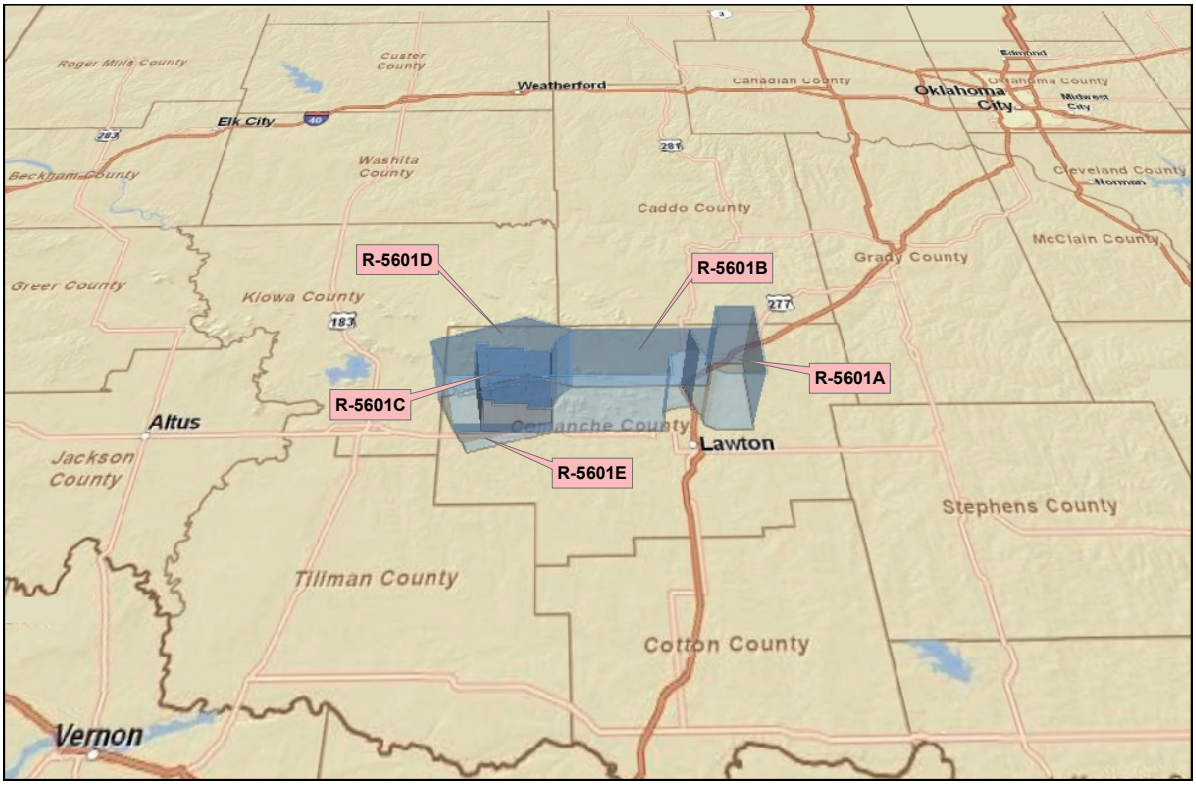


Figure 2-4. Three-Dimensional View of R-5601

2.2.5 No Action Alternative

This document refers to the continuation of the existing conditions without implementation of the Proposed Action as the No Action Alternative. CEQ regulations require consideration of the No Action Alternative. 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, the Proposed Action would not be implemented. Users of the 301 FW managed airspace would continue to operate with the current inventory of aircraft and the aircraft operations would remain unchanged in the associated airspace. The No Action Alternative is carried forward for further detailed analysis in **Section 3** of this EA.

2.3 Identification of the Preferred Alternative

The preferred alternative is the Proposed Action, as described in **Section 2.1**. Upon completion of the EA, the USAF will determine whether the Proposed Action would result in significant impacts. If such impacts are predicted, the USAF would provide mitigation to reduce impacts below the level of significance, undertake an EIS, or abandon the Proposed Action. The EA will also be used as a guide in implementing the Proposed Action in a manner consistent with the USAF standards for environmental stewardship.

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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents the characteristics of the affected environment and an analysis of the potential direct and indirect effects each alternative would have on the affected environment. Cumulative and other effects are discussed in **Section 4**. All potentially relevant resource areas were initially considered in this EA. Some were eliminated from detailed examination because of their inapplicability to this proposal. General descriptions of the eliminated resources and the basis for elimination are described in **Section 3.1**.

The Region of Influence (ROI) for this EA includes the military airspace managed by the 301 FW and the land areas directly underneath that airspace. As shown in **Table 2-1**, the 301 FW managed airspace is in Texas and Oklahoma and includes 16 MTRs, 4 MOAs, and a Restricted Area (Falcon Range). The airspace areas managed by the 301 FW are illustrated in **Figure 1-1**. Additional details of each of the airspace areas managed by the 301 FW is provided in **Appendix A**.

The following discussion elaborates on the nature of the characteristics that might relate to resources.

Short-term or long-term. These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.

Direct or indirect. A direct effect is caused by and occurs contemporaneously at or near the location of the action. An indirect effect is caused by a proposed action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action. For example, a direct effect of erosion on a stream might include sediment-laden waters in the vicinity of the action, whereas an indirect impact of the same erosion might lead to lack of spawning and result in lowered reproduction rates of indigenous fish downstream.

Negligible, minor, moderate, or major. These relative terms are used to characterize the magnitude or intensity of an impact. Negligible effects are generally those that might be perceptible but are at the lower level of detection. A minor effect is slight, but detectable. A moderate effect is readily apparent. A major effect is one that is severely adverse or exceptionally beneficial.

Adverse or beneficial. An adverse effect is one having adverse, unfavorable, or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment. A single act might result in adverse effects on one environmental resource and beneficial effects on another resource.

Significance. Significant effects are those that, in their context and due to their intensity (severity), meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27).

Context. The context of an effect can be localized or more widespread (e.g., regional).

Intensity. The intensity of an effect is determined through consideration of several factors, including whether an alternative might have an adverse impact on the unique characteristics of an area (e.g., historical resources, ecologically critical areas), public health or safety, or endangered or threatened species or designated critical habitat. Effects are also considered in terms of their potential for violation of Federal, state, or local environmental law; their controversial nature; the degree of uncertainty or

unknown effects, or unique or unknown risks; if there are precedent-setting effects; and their cumulative effects (see **Section 4**).

3.1 Preliminary Impact Assessment Exclusions

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, the following evaluation of environmental impacts focuses on those resources and conditions potentially subject to effects and on potentially significant environmental issues deserving of study, and deemphasizes insignificant issues. Some environmental resources and conditions that are often analyzed in an EA have been omitted from detailed analysis. The following provides the basis for such exclusions.

3.1.1 Geological Resources

The Proposed Action will not require construction of any facilities or result in ground-disturbing activities in the areas underlying the existing MTRs, MOAs, NAS JRB Fort Worth, or other installations. Therefore, this EA does not provide a detailed examination of geological resources.

3.1.2 Water Resources

The Proposed Action does not include any construction or ground-disturbing activities; therefore, there would be no effect on water resources underlying the MTRs, MOAs, NAS JRB Fort Worth, or other installations. Therefore, this EA does not provide a detailed examination of water resources.

3.1.3 Cultural Resources

Neither the Proposed Action nor the No Action Alternative would physically alter, damage, or destroy any cultural resource or alter characteristics of the surrounding environment that contribute to the resource's significance. Accordingly, it has been determined that a detailed examination of cultural resources in this EA is not necessary.

3.1.4 Socioeconomics and Environmental Justice

The Proposed Action does not involve any activities that would contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to NAS JRB Fort Worth; therefore, there would be no changes in area population or associated changes in demand for housing and services. The Proposed Action does not involve any activities that would contribute to changes in low-income or minority populations. Accordingly, this EA does not provide a detailed examination of socioeconomics.

3.1.5 Infrastructure

The Proposed Action would not be located in any utility corridors, and would not impact utilities or similar infrastructure. It is not within the scope of this EA to analyze any changes in the number of personnel associated with the installations using the 301 FW's airspace or any effects those personnel would have on the infrastructure surrounding those installations. Therefore, this EA does not provide a detailed examination of impacts on infrastructure.

3.1.6 Hazardous Materials and Wastes

No products containing hazardous materials (e.g., fuels, oils, lubricants, pesticides, and herbicides) would be procured or used for the implementation of the Proposed Action. It is not within the scope of the EA to analyze any changes in the amount of hazardous materials originating from installations that are using the 301 FW airspace as a result of the Proposed Action. Therefore, this EA does not provide a detailed examination of hazardous materials and wastes.

3.2 Airspace Management and Aircraft Safety

3.2.1 Definition of the Resource

Airspace management procedures assist in preventing potential conflicts or aircraft accidents associated with aircraft using designated airspace in the United States, including restricted military airspace. Airspace management is facilitated through the use of specifically identified airspace defined vertically and horizontally in physical terms and also by duration of use. Such airspace demarcations are shown on aeronautical maps used by pilots to navigate with while flying.

Airspace management is defined as the coordination, integration, and regulation of the use of airspace. Categories and types of airspace are dictated by several elements: the complexity and density of aircraft movement, the nature of aircraft operations, the level of safety required, and national and public interest in the airspace. Airspace management is an important issue when considering potential environmental and safety effects of a proposed action since it dictates the types of aircraft activities that occur at different locations and altitudes. The FAA has overall responsibility for managing airspace through a system of flight rules and regulations, airspace management actions, and air traffic control (ATC) procedures. The FAA accomplishes this through close coordination with state aviation and airport planners, military airspace managers, and other entities to determine how airspace can be used most effectively to serve all interests. All military and civilian aircraft are subject to Federal Aviation Regulations (FARs).

Airspace management and aircraft safety are interrelated topics for the Proposed Action. Airspace management addresses how and in what airspace aircraft fly. This section of the EA addresses the rules, regulations, and procedures necessary to permit aircraft to operate safely among all other aircraft in the NAS. Aircraft safety evaluation criteria include airspace operations and traffic management, as well as procedures to minimize potential damage to aircraft systems.

3.2.1.1 Airspace Management

The management of airspace is governed by Federal legislation and by military regulations and procedures. The ultimate authority in assigning and managing airspace is the FAA, which has acknowledged the need for military aircraft to conduct certain training operations within airspace that is separated from other types of civilian and commercial aircraft and sets aside such airspace for military use.

Training requirements for active-duty and reserve components of the military that involve the use of military airspace are specified in regulations written by their host commands. These regulations specify the type, frequency, and specific components of training that aircrews are required to accomplish to maintain proficiency standards necessary to meet expected wartime tasking and contingency operations.

Because airspace is a finite resource, it must be managed and used equitably to serve general, commercial, and military aviation needs. The FAA manages all airspace and has established various

airspace designations to protect aircraft while operating near and between airports, or operating within airspace identified for defense-related purposes. The FAA establishes rules of flight and ATC procedures to govern safe operations within each type of designated airspace. Military operations are generally conducted within designated airspace and follow specific procedures to maximize flight safety for nonparticipating civil or military aircraft.

The FAA regulates military operations in the NAS through the implementation of FAA Handbook 7400.2E, *Procedures for Handling Airspace Matters*, and FAA Handbook 7610.4J, *Special Military Operations*. The latter was jointly developed by the DOD and FAA to establish policy, criteria, and specific procedures for air traffic control planning, coordination, and services during defense activities and special military operations.

The objective of airspace management is to meet military training requirements through the safe and efficient use of available navigable airspace. AFI 13-201, *U.S. Air Force Airspace Management,* indicates that this objective is to be accomplished in a peacetime environment, while minimizing the impact on other aviation users and the public. Chapter 3 of the FAA *Aeronautical Information Manual* defines and provides the operational requirements for each of the various types or classes of airspace (FAA 2004).

Airspace is defined as the space that lies above a nation and comes under its jurisdiction. Although it is generally viewed as being unlimited, airspace is a finite resource that can be defined vertically and horizontally, as well as temporally, when describing its use for aviation purposes. The scheduling, or time dimension, is a very important factor in airspace management and ATC. The affected airspace environment is described in terms of its principal attributes, namely controlled and uncontrolled airspace, SUA, MTRs, en route airways, airports and airfields, and ATC. Jet routes used by commercial airlines, which are above 18,000 feet MSL, are well above the activities proposed and are thus not considered as part of the ROI. As discussed in the beginning of **Section 3**, the ROI for this EA includes all the military airspace managed by the 301 FW and the land areas directly underneath that airspace.

There are two categories of airspace, or airspace areas: regulatory (i.e., Classes A, B, C, D, and E airspace areas; restricted areas; and prohibited areas) and nonregulatory (MOAs, warning areas, alert areas, and controlled firing areas). These two categories are further divided into four classifications: controlled, uncontrolled, SUA, and airspace for special use. The categories and types of airspace are dictated by the following:

- The complexity or density of aircraft movement
- The nature of the operations conducted within the airspace
- The level of safety required
- National and public interest in the airspace.

ATC procedures provide for aircraft to be flown under IFR and VFR conditions. VFR air traffic flies below 18,000 feet above MSL using visual references such as towns, highways, and railroads as a means of navigation. VFR aircraft may also follow Federal airways at altitudes not used by aircraft on instrument flight. VFR conditions rely heavily on "see-and-avoid" procedures that require pilots to be visually alert for and maintain safe distances from other aircraft, populated areas, obstacles, or clouds. Most other air traffic (including air passenger commercial carriers, business aircraft, and military aircraft) operate under IFR conditions that require pilots to be trained and appropriately certified in instrument navigational procedures. The respective procedures established under VFR and IFR for airspace use and flight operations help segregate aircraft operating under each set of rules. Military pilots are trained for and use both VFR and IFR conditions.

Controlled Airspace. Controlled airspace is a generic term that encompasses the different classifications (Class A, B, C, D, and E) of airspace and defines dimensions within which ATC service is provided to flights under instrument meteorological conditions (IMC), and to flights under visual meteorological conditions (VMC) (see **Figure 3-1**). All military and civilian aircraft are subject to FARs.

Class A airspace includes all operating altitudes of 18,000 feet above MSL and higher. Class A airspace is most frequently utilized by commercial aircraft using altitudes between 18,000 and 45,000 feet above MSL.

Class B airspace typically comprises contiguous cylinders of airspace, stacked one upon another and extending from the surface up to 10,000 feet AGL. To operate in Class B airspace, pilots must contact appropriate controlling agencies and receive clearance to enter the airspace. Additionally, aircraft operating within Class B airspace must be equipped with specialized electronics that allow air traffic controllers to accurately track aircraft speed, altitude, and position. Class B airspace is typically associated with major airport complexes such as Dallas/Fort Worth International Airport, Texas.

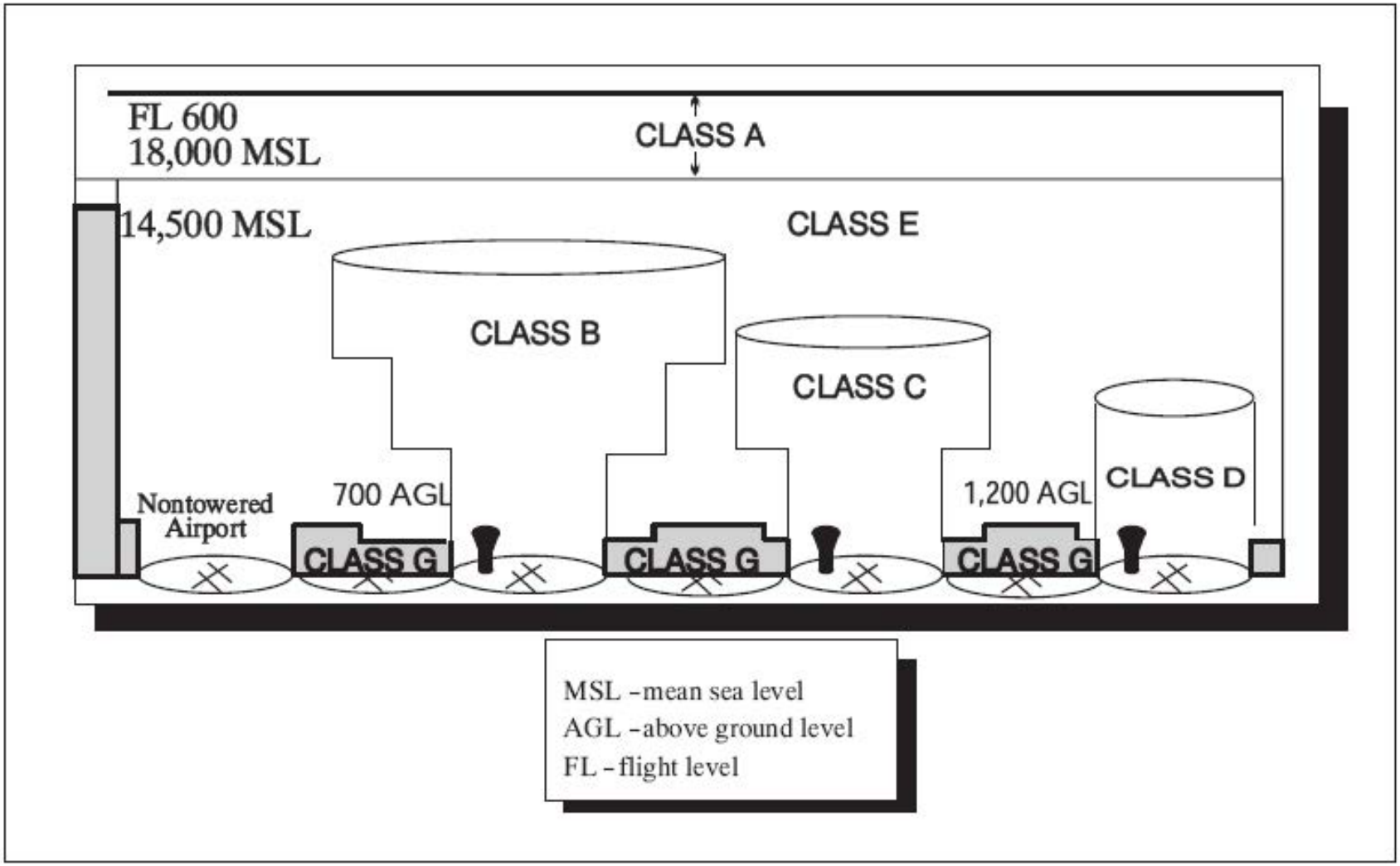
Class C airspace can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude. Class C airspace is designed and implemented to provide additional ATC into and out of primary airports where aircraft operations are periodically at high-density levels such as Abilene Regional Airport, Texas, and Will Rogers World Airport, Oklahoma. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local ATC facilities.

Class D airspace encompasses a 5-statute-mile radius of an operating ATC-controlled airport. It extends from the ground to 2,500 feet AGL or higher. All aircraft operating within Class D airspace must be in two-way communication with the ATC facility.

Class E airspace can be described as general controlled airspace. It includes designated Federal airways consisting of the high-altitude (J or "Jet" Route) system and low-altitude (V or "Victor" Route) system. Federal airways have a width of 4 statute miles on either side of the airway centerline and can be structured between the altitudes of 700 feet AGL and 18,000 feet above MSL. These airways frequently intersect approach and departure paths from both military and civilian airfields. Class E airspace can range from ground level at nontowered airfields up to 18,000 feet above MSL. The majority of Class E airspace is where more stringent airspace control has not been established.

Uncontrolled Airspace. Uncontrolled airspace (Class G) is not subject to restrictions that apply to controlled airspace. Limits of uncontrolled airspace typically extend from the surface to 700 feet AGL in urban areas, and from the surface to 1,200 feet AGL in rural areas. Uncontrolled airspace can extend above these altitudes to as high as 14,500 feet above MSL if no other types of controlled airspace have been assigned. ATC does not have authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating under VMC.

Special Use Airspace. SUA consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. With the exception of Controlled Firing Areas, special use airspace is depicted on aeronautical charts. Chart depictions include hours of operation, altitudes, and the agency controlling the airspace. All SUA descriptions are contained in FAA Order 7400.8, *Special Use Airspace* (USDOT 2007).



Source: FAA 2004

Figure 3-1. FAA Airspace Classifications

The FAA designates SUA for certain military training activities. One such airspace type is designated restricted airspace. A Restricted Area is airspace designated in FAR Part 73 within which the flight of nonparticipating aircraft, while not wholly prohibited, is subject to restriction. Restricted Areas are designated when necessary to confine or segregate activities considered hazardous to nonparticipating aircraft. The Restricted Area managed by the 301 FW is R-5601, associated with Falcon Range (see **Figure 2-2**).

Another type of SUA designated for military training activities are MOAs. MOAs are areas that consist of airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. There is no restriction against a pilot operating under VFR in these areas; however, a pilot should be alert since training activities could include certain military activities such as air combat maneuvers, air intercepts, and acrobatics (USDOT 2007). The 301 FW manages four MOAs: Brownwood, Brady North, Brady South Low, and Brady South High, as shown on **Figures 2-1** and **2-2**.

Airspace for Special Use. Airspace for Special Use are areas used by military aircraft with no restrictions on nonparticipating aircraft. They are designated as such for informational purposes for general aviation. Examples of Airspace for Special Use are MTRs and air-to-air refueling tracks.

The 301 FW manages numerous MTRs (see **Tables 1-1** and **2-1**). MTRs are flight corridors dedicated to low-level flight operations (i.e., typically below 10,000 feet above MSL) that can exceed 250 KIAS (i.e., 287 miles per hour). MTRs are typically 100 to 350 nautical miles (NM) long, 4 to 10 NM wide, and extend vertically from near ground level (i.e., 100 feet AGL) to 5,000 feet AGL or higher. A nautical mile is 1.15 statute miles. MTRs provide airspace for the practice of navigational skills over a variety of terrain and provide the military with access to drop zones, ranges, and other destinations. Separation of MTRs from commercial air routes enhances general aviation safety while allowing the military to train for low-altitude navigation. MTRs include three types and are identified as either an IR, VR, or SR followed by a numerical designation. IR denotes IFR apply along the route, whereas VR denotes VFR apply. Low-altitude navigation training is important because aircrews might be required to fly at low altitudes for tens or hundreds of miles to avoid detection in combat conditions. SRs are used by aircraft that normally operate at low-level airspeeds of less than 250 KIAS. Slower aircraft, such as the C-130 and C-9 aircraft, can fly safely in the same airspace environment with civilian or commercial air traffic by practicing see-and-avoid techniques under VMC. SRs are designated through military approval channels and do not require FAA coordination. The maximum altitude that can be flown in SRs is 1,500 feet AGL. The centerlines of MTRs are depicted on aeronautical charts. Military pilots use the routes to maintain proficiency by simulating wartime missions. Actual wartime missions require aircraft to accomplish high-speed low-level penetrations into enemy airspace in order to avoid detection. The MTRs managed by the 301 FW include 5 IRs, 9 VRs, and 2 SRs.

3.2.1.2 Aircraft Safety

Aircraft safety is based on the physical risks associated with aircraft flight and current military operation procedures concerning aircraft safety. Historical mishap databases enable the military to calculate the mishap rates for each type of aircraft. These rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft. Safe flying procedures, adherence to flight rules, and knowledge of emergency procedures form consistent and repeated aspects of training for all aircrews, including the users of the 301 FW managed airspace. Since the inception of the USAF in 1947, aircraft accidents have steadily declined each year.

Obstructions to flights, which include towers and power transmission lines, represent safety concerns for aircrews, especially those engaged in low-altitude flight training. Hazardous weather conditions can pose safety hazards and influence a pilot to alter flight. Pilots consult the National Weather Service or weather services at local airports to obtain preflight weather information. Adverse weather conditions of concern include tornadoes, thunderstorms, hail, severe turbulence, dust storms, and wind shear. The evaluation of potential hazards of weather conditions rests in a pilot's sound discretion based on knowledge of available information, experience, and the operational limits of the aircraft. Therefore, weather-related safety issues are not carried forward for further analysis in this EA.

All military aircraft fly in accordance with FAR Part 91, *General Operating and Flight Rules*, which governs such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes when flying outside SUA. This regulation has precise requirements for the use of airports, heliports, and other landing areas; local flying rules; and SUA. For example, an installation commander having USAF aircraft assigned to, attached to, or tenant to his or her command must prepare and publish local flying rules. These rules include the use of tactical training and maintenance test flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. Altitudes for aircraft using SUA are set to ensure the safest operating environment. Installation commanders may set different altitudes based on noise abatement, fly neighborly policies, or other safety considerations.

AFI 91-202, *The USAF Mishap Prevention Program*, implements Air Force Policy Directive 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including Bird/Wildlife Aircraft Strike Hazard [BASH]), assigns responsibilities for program elements, and contains program management information. BASH considerations for the 301 FW managed airspace are discussed in **Section 3.6.2.4**.

Bird and wildlife strikes are a safety concern due to the potential damage that a strike might have on the aircraft or injury to aircrews. Birds can be encountered at altitudes of 30,000 feet and higher. However, strike rates rise substantially as altitude decreases. Most birds fly close to ground level and 95 percent of all reported incidents in which a USAF aircraft has struck a bird have been at less than 3,000 feet AGL. Approximately half of these bird strikes occur in the airport environment and about one-third occur during low-altitude training. The USAF devotes considerable attention to avoiding the possibility of bird/wildlife aircraft strikes. It has conducted a worldwide program for decades to study bird migrations, bird flight patterns, and past strikes to develop predictions of where and when bird/wildlife aircraft strikes might occur so as to avoid such incidents.

3.2.2 Description of the Affected Environment

3.2.2.1 Airspace Management

The locations of the airspace for which the 301 FW has management responsibility are show on **Figure 1-1**. As indicated on **Figure 1-1**, many of the MTRs that the 301 FW manages overlap or share common route segments. Also, portions of several routes encompass airspace within the Brownwood and Brady MOAs. These routes include VR101, VR143, VR186, IR123, and IR124. More detailed information concerning specific routes is provided in **Appendix A**.

Table 2-1 provides the number of annual operations assessed for each airspace component managed by the 301 FW. Additional information on the breakdown of annual operations by aircraft type is also presented in **Appendix A**. As presented in **Table 2-1**, the baseline number of annual operations for the entire 301 FW managed airspace totals 14,861. An operation is defined as an event in the airspace. As an example, on a typical training flight, an aircraft takes off and flies on one SR, then on one VR, then performs air combat maneuvers in a MOA, and returns to home base. This equates to 1 operation for the SR, 1 operation for the VR, and 1 operation for the MOA.

Military Training Routes. Training requirements associated with most military fixed-wing aircraft missions involve the use of MTRs. A total of 16 existing MTRs (as shown in **Table 1-1**) are currently being used to accomplish required mission readiness training requirements for users who have access to the airspace managed by the 301 FW. The MTRs managed by the 301 FW include five IRs, nine VRs, and two SRs.

IRs and VRs offer more flexibility to aircrews in that they can be flown at higher airspeeds and altitudes than SRs. Both VRs and IRs are flown under VMC but IRs can also be flown under IMC. These routes are operated under FAA-issued waivers to the DOD to permit operation of an aircraft below 10,000 feet above MSL in excess of 250 KIAS along DOD/FAA mutually developed and published routes. SRs have maximum airspeed and altitude limitations of 250 KIAS and 1,500 feet AGL.

The existing MTRs managed by the 301 FW, which have been assessed for routine use by the various military aircraft, overlie portions of Texas and Oklahoma. The Special Operating Procedures section of the *DOD Flight Information Publication*, *Area Planning*, *Military Training Routes, North and South America* (DOD 2008) dated 31 July 2008 provides notification, operational procedures, and avoidance criteria for noise-sensitive receptors, airfields, environmentally sensitive areas, flight safety considerations, obstructions, and other areas of concern within each MTR (USDOT 2007).

MOAs. A total of four MOAs (i.e., Brady North, Brady South Low, Brady South High, and Brownwood) are currently being used to accomplish required mission readiness training requirements for users of the airspace managed by the 301 FW. The entire Brownwood MOA complex is composed of multiple MOAs. Brownwood 1 East, 1 West, 2 East, and 2 West have a lower altitude of 7,000 MSL, and Brownwood 3 and 4 have a lower altitude of 13,000 MSL. All portions of the Brownwood MOA have an upper altitude of 18,000 MSL. For the purpose of this EA, all six parts are referred to collectively as the Brownwood MOA.

Restricted Areas. A Restricted Area is present in the airspace associated with Falcon Range (see **Figure 2-2**) and is designated as R-5601. Restricted areas contain airspace within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Restricted airspaces are needed when the designated airspace can contain hazardous military activities including live firing of weapons, ordnance delivery, or aircraft testing. Most restricted areas (including R-5601) have specific hours of operations, and users must have permission from the controlling agency before flight through the defined areas.

3.2.2.2 Aircraft Safety

Aircraft safety associated with the 301 FW managed airspace includes the following five key concerns:

1. Aircraft mishaps
2. Local airport exclusion areas in the Brady South High and Low MOAs
3. Chaff and flare activities in Brownwood and Brady MOAs
4. "Lights-out" training utilizing NVG currently occurring in the Brownwood MOA, with a pending request for this training to occur in Brady North, Brady South Low, and Brady South High MOAs
5. BASH issues.

The USAF has defined five classifications of aircraft mishaps: Classes A, B, C, D, and E (USAF 2008). Class A mishaps result in a total cost in excess of $1 million, a fatality or permanent total disability, or destruction or damage beyond economical repair to USAF aircraft. Class B mishaps result in a direct mishap cost totaling $200,000 or more (but less than $1 million), a permanent partial disability, or

inpatient hospitalization of three or more personnel. This does not include individuals hospitalized for observation, diagnostic, or administrative purposes that were treated and released. A Class C mishaps result in total damage that costs in excess of $20,000 (but less than $200,000), or any injury or occupational illness or disease that causes loss of one or more days away from work beyond the day or shift it occurred (called Lost Time). Class D mishaps result in any nonfatal injury or occupational illness that does not meet the definition of Lost Time provided in AFI 91-204, *Safety Investigations and Reports* (USAF 2008). Class E mishaps are those occurrences that do not meet reportable mishap classification criteria, but are deemed important to investigate/report for mishap prevention. Class E reports provide an expeditious way to disseminate valuable mishap prevention information.

The environment for aircraft safety is based on the physical risks associated with aircraft flight and current military operational procedures concerning aircraft safety. Historical mishap databases enable the military to calculate the mishap rates for each type of aircraft. As discussed in **Section 3.1.1**, these rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft.

No aircraft mishaps have occurred in the 301 FW managed airspace in the past 10 years. The most recent aircraft mishaps that occurred in the ROI were two separate Class A mishaps involving F-16 aircraft in 1993 and 1994 that occurred in the Brownwood MOA. No civilian fatalities or injuries occurred as a result of these mishaps (Queretaro 2008).

Two airport exclusion areas are present within the Brady South High and Low MOAs, as shown in **Figure 2-3**. The first is for San Saba County Municipal Airport in the northeastern portion of the MOAs, and the second is for Curtis Field Airport in the southwestern portion of the MOAs. In the exclusion areas, military aircraft must fly 1,500 feet AGL or higher to avoid arrivals and departures into the local airports. The exclusion areas also require general aviation aircraft to stay below 1,500 feet AGL so that they don't come into contact with military aircraft using the MOAs.

Training in the Brownwood and Brady MOAs could involve the use of chaff and flares. Such combat condition training is necessary to simulate and respond to ground-based and aircraft threats. Chaff consists of fine filaments of fiberglass with an aluminum coating. When released from an aircraft as a "burst," chaff becomes a diffuse radar-reflecting cloud that obscures the aircraft from ground or airborne radar. This radar screen allows the aircraft to evade radar positioning and target acquisition by either ground or airborne opponents. All types of flares can be used in the 301 FW managed airspace, but they must burn out before reaching 400 feet AGL (Queretaro 2009b).

Another safety concern is that aircrews can perform "lights-out" training utilizing NVG. In July 2001, the USAF filed a petition with the Department of Transportation seeking relief from the requirements of 14 CFR 91.209(a)(1) and (b). With this petition, the USAF wished to conduct certain night flight military training operations for various aircraft without lighted aircraft position lights. In January 2003, the USAF was granted an exemption (No. 7960) by the FAA for such training in select MOAs. The Brownwood MOA is included on the list of MOAs available for the lights-out activity. In July 2006, the FAA granted the USAF an extension to exemption No. 7960 until 31 January 2009. The extension also granted the USAF permission to include participation of aircraft from other military services while conducting joint operations (AOPA 2007). A request to include Brady North, Brady South Low, and Brady South High MOAs on the list of MOAs available for the lights-out activity is currently pending with the FAA, it is anticipated that the three MOAs will be added to the list in September 2009 (Queretaro 2009a).

By conducting lights-out training prior to actual combat, pilots have an opportunity to achieve the confidence, proficiency, and situational awareness needed to be successful in combat. The USAF needs a solution that permits this vital training to occur within accessible airspace so USAF pilots can "train as

they fight." Due to incompatibility between external aircraft lighting and NVG technology, a vast majority of NVG training must be conducted with reduced or extinguished external lighting (USAF 2001). To enhance their ability to see the outside environment, crews fly using NVG. The use of traditional aircraft lighting "washes out" the pilot's field of vision, hampering their ability to operate safely.

As a result of exemption No. 7960, nonparticipating general aviation aircraft share airspace with unlit, high-speed military aircraft conducting training operations. Nonparticipating pilots have to rely completely on the actions of another aircraft pilot, one with whom they will have no contact (visual or otherwise). Although USAF pilots are among the best-trained aviators in the world, there is an inherent danger in having dissimilar aircraft operating under the prescribed conditions without certain safeguards being in place. Based on recommendations from the Aircraft Owners and Pilots Association, the FAA implemented provisions to address aircraft safety, which include the following (AOPA 2007):

- Military personnel must continuously monitor operations conducted in selected MOAs in order to detect all nonparticipating aircraft.
- The FAA Flight Standards Service will provide information to be published in the *Aeronautical Information Manual* that will provide clarification of the procedures developed for these operations and additional guidance for pilots who operate civil aircraft in the MOAs.
- The USAF must establish a procedure to provide informational briefings to local flying organizations, businesses, and other civilian users within 100 NM of the MOA airspace. These briefings must be provided annually and must be coordinated with the manager of the appropriate flight standards district office. The intent is to increase their awareness of lights-out operations and open lines of communications between the USAF and the civilian users of the MOA airspace.
- In response to this provision, the Aircraft Owners and Pilots Association Air Safety Foundation teamed with the USAF and the Department of Defense to produce *Mission: Possible, Navigating Today's Special Use Airspace,* a safety seminar designed specifically to teach civil pilots how to deal with military lights-out training.

Another aircraft safety issue is BASH. There is always a possibility of bird and wildlife strikes whenever aircraft operate, especially when operating in close proximity to the ground. BASH issues for the ROI as they relate to biological resources are discussed in **Section 3.6.2.4**.

3.2.3 Environmental Consequences

The significance of potential impacts on airspace management or air traffic depends on the degree to which the action would affect the airspace environment. Significant impacts could occur if the results were to impose major restrictions on air commerce opportunities, significantly limit airspace access to a large number of users, or require modifications to air traffic control systems.

Impacts on airspace use were assessed by comparing the projected military flight operations with existing conditions and with civil aviation activities in the defined ROI. This assessment included analyzing the capability of affected airspace elements to accommodate projected military activities, and determining whether such increases would have any adverse impacts on overall airspace use in the area. Also included are considerations of such factors as the interaction of the proposed use of specific airspace with adjacent controlled, uncontrolled, or other military training airspace; possible impacts on other nonparticipating civil and military aircraft operations; and possible impacts on civil airports that underlie or are proximate to the airspace involved in the proposal.

Proposed Action

Airspace Management. Impacts on airspace management are predicated on the extent to which the Proposed Action would affect air traffic within the MTRs, MOAs, and Restricted Area managed by the 301 FW. There would be no significant, adverse effects pertaining to use of the airspace under the Proposed Action due to the fact that no new airspace is proposed. Implementation of the Proposed Action would not result in the need to reconfigure current military airspace, impose any major restrictions on air commerce opportunities, significantly limit airspace access to large numbers of users over current conditions, or require modifications to air traffic control systems.

Total airspace operations associated with 301 FW managed airspace would increase by approximately 21 percent under the Proposed Action (see **Table 2-1**), from a baseline of 14,861 annual operations to 17,931 annual operations under the Proposed Action. However, this increase is spread over a very large area, which includes 16 MTRs, 4 MOAs, and a Restricted Area. The percent increase in operations varies by airspace area. Integration of any new flying operational procedures for the aircraft associated with the Proposed Action into local operating procedures and aircraft security issues would be identified and addressed during implementation of the Proposed Action. Any impacts from the increase in aircraft operations as a result of the Proposed Action could be reduced by an increase in ATC personnel.

Coordination between the services over joint use of military airspace and other training assets managed by the 301 FW is an ongoing activity. Significant planning has occurred to anticipate needs, identify potential problems, and develop workable solutions for issues associated with use of these airspace and associated ATC requirements. Such planning, continuing after implementation of the Proposed Action, should ensure that impacts associated with use of airspace and airspace management requirements are negligible.

Aircraft Safety. Long-term minor adverse impacts on aircraft safety due to aircraft mishaps would be expected as a result of the Proposed Action. Implementation of the Proposed Action would increase the total number of annual operations flown within the 301 FW managed airspace by approximately 21 percent from baseline annual operations. Aircraft mishap rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft. The mishap rate could increase due to the fact that pilots are flying more operations in the airspace, which would increase the estimated flying time that an aircraft would be in the airspace. However, qualified pilots would be conducting the proposed aircraft operations within these airspace areas. Safe flying procedures, adherence to flight rules, and knowledge of emergency procedures form consistent and repeated aspects of training for all aircrews, including the users of the 301 FW managed airspace. The continued implementation of AFI 91-202, *The USAF Mishap Prevention Program*, would also reduce the potential for mishaps (USAF 1998).

No impacts would be expected from the continued existence of the San Saba County Municipal Airport and Curtis Field Airport exclusion areas within the Brady South High and Low MOAs. Military pilots using the MOAs are already aware of the exclusion areas and are instructed to stay 1,500 feet AGL or above while in the exclusion areas. General aviation pilots are already aware that the exclusion areas are within the MOAs, and are instructed to stay below 1,500 feet AGL while in the exclusion areas.

In August 1997, Air Combat Command (ACC) finalized an in-depth summary of the types of chaff and flares used within ACC-controlled military airspace, and the general effects of their use on the environment entitled *Environmental Effects of Self-Protection Chaff and Flares* (USAF 1997). ACC developed guidelines to assist in the assessment of the environmental impacts of proposals with chaff and flare use and to prepare documentation to comply with NEPA. The guidelines are based on the findings and conclusions of the study concerning the potential effects of chaff and flares on health, safety, air

quality, physical resources (e.g., soil and water resources), biological resources, land use and visual resources, and cultural resources. Issues that were documented in the study were found to have no significant environmental impacts. Therefore, the continued use of chaff and flare training in the Brownwood and Brady MOAs under the Proposed Action would have no significant environmental impacts on aircraft safety. Environmental impacts on biological resources from chaff and flare use are discussed in **Section 3.6.3**.

Long term minor adverse impacts on aircraft safety due to "lights-out" training utilizing NVG would be expected to continue under the Proposed Action. Lights-out training utilizing NVG currently occurs in the Brownwood MOA, and a request to the FAA is currently pending for this training to occur in Brady North, Brady South Low, and Brady South High MOAs. It is anticipated that the three MOAs will be added to the list of approved MOAs for lights-out training utilizing NVG in September 2009 (Queretaro 2009a). As previously discussed, the increase in the number of annual operations flown in the airspace under the Proposed Action would increase the number of hours pilots would spend in the airspace. Therefore, nonparticipating general aviation aircraft would share airspace with unlit, high-speed military aircraft conducting training operations more frequently under the Proposed Action and the forecasted scenario. Nonparticipating pilots would have to rely completely on the actions of another aircraft pilot more frequently, one with whom they will have no contact (visual or otherwise). Although USAF pilots are among the best-trained aviators in the world, there is an inherent danger in having dissimilar aircraft operating under the prescribed conditions without certain safeguards being in place. These safeguards were discussed in **Section 3.2.2.2**.

Long-term minor adverse effects would be expected to continue from BASH. BASH issues for the ROI as they relate to biological resources are discussed in detail in **Section 3.6.2.4**. There is always a possibility of bird and wildlife strikes whenever aircraft operate, especially when operating in close proximity to the ground. As discussed in **Section 3.6.2.4**, Texas is world-renowned for the variety of bird species that reside or migrate through the state to spend the winters in Central and South America. The subject airspace in Texas and Oklahoma is within the North American Central Migration Flyway. Consequently, numerous species of migrant and resident bird species have potential to use the airspace in the ROI. Under the Proposed Action, the number of annual operations flown in the airspace managed by the 301 FW would increase, which would also increase the number of hours pilots spend in the airspace. Since pilots are spending more time in the airspace, the likelihood that a bird strike could occur would also increase.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. Users of the 301 FW managed airspace would continue to operate with the current inventory of aircraft and the aircraft operations would remain unchanged in the associated airspace. There would be no change in the existing conditions as described in **Section 3.2.2**. No effects on airspace management or aircraft safety above existing levels would be expected.

Cumulative Impacts

As discussed in **Section 2.1**, the forecasted operations presented in **Table 2-1** include the operations shown as part of the Proposed Action. Implementation of the forecasted scenario would increase the total number of annual operations flown by approximately 43 percent from the annual operations under the Proposed Action, and approximately 73 percent from baseline annual operations. Cumulative impacts associated with the forecasted scenario are expected to be similar to the impacts discussed above for the Proposed Action.

3.3 Noise

3.3.1 Definition of the Resource

Noise represents the most identifiable concern associated with aircraft operations. Although communities and even isolated areas receive more consistent noise from other sources (e.g., cars, trains, construction equipment, stereos, wind), the noise generated by aircraft overflights often receives the greatest attention. General patterns concerning the perception and effect of aircraft noise have been identified, but attitudes of individual people toward noise are subjective and depend on their situation when exposed to noise. Therefore, annoyance is considered the primary consequence of aircraft noise. The subjective impression of noise and the disturbance of activities are believed to contribute significantly to the general annoyance response. A number of non-noise-related factors have been identified that might influence annoyance. Annoyance from aircraft noise is discussed further in **Section 3.3.3**.

Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on the roof. Sound is measured with instruments that record instantaneous sound levels in decibels. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. Noise levels, resulting from multiple single events, are used to characterize community noise effects from aircraft operations and are measured using the day-night average A-weighted sound level (DNL). A-weighted decibels (dBA) are used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. All of the noise levels discussed in this EA are in dBA. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or as annoying noise. Affected receptors are specific (i.e., schools, churches, or hospitals) or broad areas (e.g., nature preserves or designated districts) in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise levels in residential areas vary depending on the housing density and location. As shown in **Table 3-1**, a normal suburban area is about 55 dBA, which increases to 60 dBA for an urban residential area, and to 80 dBA in the downtown section of a city (FHWA 1980).

Table 3-1. Typical Outdoor Noise Levels

DNL (dBA)	Location
50	Residential area in a small town or quiet suburban area
55	Suburban residential area
60	Urban residential area
65	Noisy urban residential area
70	Very noisy urban residential area
80	City noise (downtown of major metropolitan area)
88	3rd floor apartment in a major city next to a freeway

Source: FHWA 1980

Noise Metrics. The most widely accepted metric for characterization of the noise environment is the DNL metric. DNL provides the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. to account for increased annoyance. DNL values are obtained by averaging sound exposure level values for a given 24-hour period. DNL is the preferred sound level metric used to characterize noise impacts by FAA, U.S. Department of Housing and Urban Development, USEPA, and DOD for modeling airport environments.

Individual low-altitude events are different from typical noise sources because the rapid onset of aircraft noise in an MTR can create a startle effect. To account for the startle effect of noise events such as low-altitude overflights by high speed military aircraft that are characterized by high onset rates (i.e., the noise level increases very rapidly), the USAF has developed a noise metric specifically for MTRs under direction of the Armstrong Aerospace Medical Research Laboratory called the onset rate-adjusted monthly day-night average (L_{dnmr}). L_{dnmr} represents an average for an entire month, utilizing the highest monthly operational flying activity. The L_{dnmr} includes a 10-dBA penalty for events occurring between 10:00 p.m. and 7:00 a.m. to account for the increased intrusiveness of events that occur during this period when ambient noise levels are generally low and many persons are asleep or engaged in activities subject to interference by high noise levels, such as watching television or listening to music. An additional penalty of up to 11 dBA is added to compensate for the startle effects of a low-altitude overflight.

The USAF recommends that the L_{dnmr} be used as the primary metric for assessing the impact on people of low altitude, high speed military aircraft operations on MTRs, in MOAs, and in the vicinity of bombing ranges. The USAF further recommends that the L_{dnmr} be used in a manner equivalent to the DNL in assessing the land use compatibility of military aircraft noise in such areas. Environmental sound levels below a DNL of 65 dBA are considered compatible with all land uses, including residential development (FICON 1992), and a DNL of 55 dBA has been identified by the USEPA as adequate to protect human health and welfare with an adequate margin of safety (USEPA 1974). Land uses in the ROI are discussed in **Section 3.4**.

Although the DNL or L_{dnmr} is the most useful single metric for characterizing the long-term noise environment, other metrics are useful in characterizing the noise associated with individual events such as a single aircraft flyover. Of the available metrics, the Sound Exposure Level (SEL) is the most useful because it is a composite metric that takes into account the most important characteristics of time varying noise events such as aircraft flyovers, the changing sound levels that occur during the event, and the duration of the noise event. The SEL is a measure of the total sound exposure of an event compressed into a 1-second time interval. Thus, it takes in the sound energy of the event and represents it as a steady noise level that lasts for 1 second. It is important to note that the SEL does not represent the level of sound heard at any specific instant; however, it provides a measure of the total sound energy of a single event and permits comparison of events that differ in both level and duration.

3.3.2 Description of the Affected Environment

The ROI for the Proposed Action includes 16 MTRs, 4 MOAs, and a Restricted Area (Falcon Range) managed by the 301 FW, as shown on **Figure 1-1**, and the land areas underneath this airspace. The airspace managed by the 301 FW is all currently in existence; no new airspace is required under the Proposed Action. The airspace managed by the 301 FW is spread across a large predominately rural area that includes portions of 68 counties: 19 in Oklahoma and 49 in Texas. Typically in rural areas, the dominant noise sources consist of vehicle traffic and industrial facilities. Multiple interstate highways, state routes, and local roadways are within the ROI. The roadways that contribute to vehicle noise within the ROI are show in **Appendix A**. As discussed in **Section 3.2.1.1**, jet routes used by commercial airlines, which are above 18,000 feet MSL, are well above the activities proposed and are not considered part of the ROI.

3.3.3 Environmental Consequences

Analysis Methodology. To allow estimation of the long-term sound levels associated with operations on MTRs, in MOAs, and at bombing ranges, the USAF has developed the *Military Operating Area and Range Noise Model* (MR_NMAP). This computer-based model is designed to predict the levels associated with aircraft operations that vary randomly in altitude and do not follow precise ground tracks. MR_NMAP was used to calculate noise levels associated with 301 FW managed airspace for the baseline and Proposed Action annual operations as shown in **Table 2-1**. Data (shown in **Appendix A**) concerning the type of aircraft, power levels, aircraft speed, altitude distribution, and route width was entered into the model. The MR_NMAP program was then used to calculate the average L_{dnmr} levels directly under the centerline of the MTRs and the average distributed L_{dnmr} level in areas underlying the MOAs and Falcon Range. In addition, the model also calculated the number of events that would exceed a SEL of 65 dBA at the route centerline or within an area underlying a MTR, MOA, or Falcon Range. The results of this analysis are summarized in **Table 3-2**.

Table 3-2. Noise Levels Associated with Baseline and Proposed Action Annual Operations in the 301 FW Managed Airspace

Airspace [1]	Baseline (Pre-BRAC)		Proposed Action (Post-BRAC)	
	Estimated Maximum L_{dnmr} (dBA)	*Events above a SEL of 65 dBA per month* [2]	*Estimated Maximum L_{dnmr} (dBA)*	*Events above a SEL of 65 dBA per month* [2]
VR101	< 55	0	< 55	0
VR104	< 55	0	< 55	0
VR118	< 55	0	< 55	0
VR143	< 55	0	< 55	0
VR186	< 55	0	< 55	0
VR1110	< 55	0	< 55	0
VR1124	< 55	0	< 55	0
VR1128	< 55	0	< 55	0
VR1137	< 55	0	< 55	0
IR103	< 55	0	< 55	0
IR105	< 55	0	< 55	0
IR123	< 55	0	< 55	0
IR124	< 55	0	< 55	0
IR139	< 55	0	< 55	0
SR228	< 55	0	< 55	0
SR270	< 55	0	< 55	0
Brady North MOA	< 55	1	< 55	1
Brady South Low MOA	< 55	0	< 55	0
Brady South High MOA	< 55	1	< 55	1
Brownwood MOA	< 55	0	< 55	0
Falcon Range (R-5601C/D/E [3])	56.2	2	57.3	3

Notes:

1. Noise levels shown for the MTRs are at the route centerline.
2. SEL values are rounded.
3. The noise levels shown for Falcon Range are for R-5601C, D, and E combined.

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Projected noise effects were evaluated qualitatively for the alternatives considered.

Annoyance. Noise can cause a person to become annoyed. Noise annoyance is defined by USEPA as any negative subjective reaction to noise by an individual or group. Aircraft noise effects can be described according to two categories: annoyance and human health considerations. Annoyance, which is based on a perception, represents the primary effect associated with aircraft noise. DNL is the accepted unit for quantifying community annoyance to general environment noise, including aircraft noise.

Table 3-3 presents the percentages of people that would be projected to be "highly annoyed" when exposed to various levels of noise measured in DNL. This table presents the results of more than a dozen studies of the relationship between noise and annoyance levels. This relationship was suggested in 1977 by the National Academy of Sciences and was subsequently reevaluated for use in describing people's reaction to semicontinuous (transportation) noise (Finegold et al. 1994). The data shown provide a perspective on the level of annoyance that might be anticipated. For example, 12 to 22 percent of persons exposed on a long-term basis to a DNL of 65 to 69 dBA are expected to be annoyed by such noise events.

Table 3-3. Percentage of Population Highly Annoyed by Noise Exposure Levels

DNL	Percentage of Persons Highly Annoyed	
	Low	***High***
65–69 dBA	12	22
70–74 dBA	22	36
75–79 dBA	36	54
80+ dBA	> 54	

Source: Finegold et al. 1994

Proposed Action

The baseline and Proposed Action annual operations summarized in **Table 2-1,** as well as the data consisting of the type of aircraft, power levels, aircraft speed, altitude distribution, and route width shown in **Appendix A** were entered into the MR_NMAP model to estimate the maximum L_{dnmr} levels expected to occur as a result of each of aforementioned scenarios. The results of this analysis are summarized in **Table 3-2**, which shows the maximum L_{dnmr} at the MTR centerline and the number of events where the SEL would be expected to exceed 65 dBA. This table also shows the average noise level in the areas under each of the MOAs and the airspace surrounding Falcon Range.

Long-term intermittent minor adverse impacts on the acoustical environment would be expected to continue as a result of the aircraft noise associated with the Proposed Action. Long-term intermittent minor adverse impacts on the acoustical environment exist because the airspace managed by 301 FW is currently in use, therefore intermittent aircraft overflights are already occurring. The Proposed Action does not include any construction or personnel changes at NAS JRB Fort Worth or the other users of the 301 FW managed airspace. Therefore, there would be no change in the amount of vehicle noise.

Individuals are often interested in what they might personally experience from an aircraft overflight in their vicinity. The ambient noise level in a quiet suburban residential area in the daytime is generally a DNL of about 50 dBA, which increases to 60 dBA for an urban residential area, and 80 dBA for the downtown area of a major city in the daytime (USEPA 1974). As discussed in **Section 3.4.2**, most of the land underlying the MTRs, MOAs, and Falcon Range is undeveloped, and is classified as forested or agricultural; with some open water (USGS 2001). The USEPA estimates the ambient sound level of agricultural areas at approximately 44 dBA (USEPA 1974). Individual A-weighted sound levels can vary widely depending upon the location, season, and weather. Levels can range from 20 dBA up to 60 dBA.

If an aircraft passes directly overhead at low altitude, the SEL can exceed 100 dBA. When aircraft operations occur in an area it is important to understand that individual aircraft noise events are typically heard for only a few seconds. The instantaneous noise level is very low at the beginning and end of this period. As the aircraft approaches, the sound level increases to some maximum level depending on how close the aircraft comes to the receiver or individual on the ground. If an aircraft passes to the side of a person (or any receiver) at some distance, the maximum noise level experience would be lower, but the levels would be near that maximum for a longer period of time. For example, if a person were half a mile to the side, the noise level would be 10 to 15 dBA lower than if the overflight were directly overhead. An aircraft 2 to 3 miles away might not be heard at all. Weather conditions, maintenance requirements, mission requirements, and other factors can cause variations in daily training activities.

The likelihood of an aircraft flying over an individual varies depending upon the type of airspace being flown in. Typically, residences and cities are overflown at a minimum altitude of 1,000 feet AGL. In MTRs, flights are dispersed within the corridor, both horizontally and vertically. The wider the corridor, the lower the probability that any given point would be overflown more than once per day. The widest segments spread out the operations, thereby reducing the probability of overflight in any one location.

Total airspace operations associated with 301 FW managed airspace would increase by approximately 21 percent under the Proposed Action (see **Table 2-1**), from a baseline of 14,861 annual operations to 17,931 annual operations under the Proposed Action. However, this increase would be spread over a very large area, which includes 16 MTRs, 4 MOAs, and a Restricted Area. As discussed in **Section 3.3.1**, a DNL of 55 dBA has been identified by the USEPA as adequate to protect human health and welfare with an adequate margin of safety (USEPA 1974). The USAF recommends that the L_{dnmr} be used in a manner equivalent to the DNL in assessing the land use compatibility of military aircraft noise in such areas. Therefore, an L_{dnmr} of 55 dBA is adequate to protect human health and welfare with an adequate margin of safety.

As shown in **Table 3-2**, L_{dnmr} levels for the MTRs and MOAs are less than 55 dBA for the baseline and Proposed Action annual operations. In addition, for the Proposed Action all of the L_{dnmr} levels for the MTRs and MOAs are below the ambient sound level of approximately 44 dBA. The L_{dnmr} levels at Falcon Range for both operational scenarios would exceed 55 dBA. However, none of the L_{dnmr} levels for the 301 FW managed airspace would exceed the threshold of 65 dBA required for land use planning.

The increased number of annual operations under the Proposed Action would increase the likelihood that a high-speed aircraft flyover would startle a noise sensitive receptor underneath the airspace. The areas underlying the 301 FW managed airspace are predominately rural; therefore, the startle effect would be limited to a small number of noise receptors underneath the aircraft's flight path. In more populated areas pilots would continue to observe all rules governing standoff distances (i.e., AFI 11-202 and FAR Part 91-119), which stipulate aircraft must avoid congested areas and settlements by 1,000 feet AGL; stay within a horizontal radius of 2,000 feet of other aircraft; and avoid isolated people, vessels, vehicles, or structures by 500 feet.

Based on annoyance factors correlated to aircraft noise (see **Table 3-3**) less than 12 percent of people living under the 301 FW managed airspace would be expected to be highly annoyed. As shown in **Table 3-2**, under baseline conditions no events per month above an SEL of 65 dBA would be expected for the areas underlying the MTRs, or the Brady South Low and Brownwood MOAs. The number of SEL events above 65 dBA would not increase in areas underlying the MTRs or the Brady South Low and Brownwood MOAs under the Proposed Action. Approximately one event above an SEL of 65 dBA occurs in the areas underlying the Brady North and Brady South High MOAs per month under baseline conditions. The number of SEL events above 65 dBA would not increase under the Proposed Action in the areas underlying these MOAs. The number of SEL events above 65 dBA in Falcon Range would increase from 2 per month under baseline conditions to 3 per month under the Proposed Action. The airspace managed by 301 FW is currently in use, so intermittent aircraft overflights in these areas are already occurring. Therefore, it is expected that an increase of one SEL event above 65 dBA per month for the Proposed Action would have a negligible long-term impact on the area underlying Falcon Range.

The MR_NMAP model was also used to predict the maximum cumulative L_{dnmr} levels at locations where MTRs cross, or where MTRs overlap in an area underlying the MOAs. Two areas within the 301 FW managed airspace were analyzed for potential cumulative L_{dnmr} levels. These two areas are as follows:

1. Where VR104 (segment I-J) and VR1137 (segment H-I) overlap with Falcon Range (as shown in **Figures A-8** and **A-15**).
2. Where IR124 (segment F-G) and VR186 (segment F-G) overlap with the Brady South Low MOA (as shown in **Figures A-5** and **A-11**).

Neither of these areas resulted in a cumulative L_{dnmr} levels above 65 dBA; however, the first area would result in cumulative L_{dnmr} levels above 55 dBA. For the first area (VR104, VR1137, and Falcon Range) that was analyzed, the cumulative L_{dnmr} level associated with baseline conditions would be approximately 56.2 dBA, and the cumulative L_{dnmr} level associated with the Proposed Action would be approximately 57.3 dBA (a 2 percent increase). For the second area that was analyzed, the cumulative L_{dnmr} level associated with baseline conditions would be approximately 44.8 dBA, and the cumulative L_{dnmr} level associated with the Proposed Action would be approximately 46.4 dBA (a 4 percent increase). Since the cumulative L_{dnmr} levels for both areas would be below 65 dBA, there would be no increased impact on the acoustical environment in these areas as a result of overlapping airspace components. Long-term intermittent minor adverse impacts on the acoustical environment would be expected to continue as a result of the aircraft noise associated with the Proposed Action.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. NAS JRB Fort Worth would continue to operate with the current inventory of aircraft and the aircraft operations would remain unchanged in the associated airspace. There would be no change in acoustical environment as described in **Section 3.3.2** for baseline conditions.

Cumulative Impacts

As discussed in **Section 2.1**, the forecasted operations presented in **Table 2-1** include the operations shown as part of the Proposed Action. Implementation of the forecasted scenario would increase the total number of annual operations flown by approximately 43 percent from the annual operations under the Proposed Action, and approximately 73 percent from baseline annual operations. However, as discussed above for the Proposed Action, this increase in aircraft operations would be spread over a very large area, which includes 16 MTRs, 4 MOAs, and a Restricted Area. Long-term intermittent minor adverse impacts

on the acoustical environment due to aircraft noise would be expected to continue under the forecasted scenario.

The same analysis methodology used above for the Proposed Action was used to calculate noise levels associated with 301 FW managed airspace for the forecasted annual operations as shown in **Table 2-1**. The results of this analysis are shown in **Table 3-4**.

Table 3-4. Noise Levels Associated with Forecasted Annual Operations in the 301 FW Managed Airspace

Airspace [1]	Forecasted	
	Estimated Maximum L_{dnmr} (dBA)	*Events above a SEL of 65 dBA per month* [2]
VR101	< 55	0
VR104	< 55	0
VR118	< 55	0
VR143	< 55	0
VR186	< 55	0
VR1110	< 55	0
VR1124	< 55	0
VR1128	< 55	0
VR1137	< 55	0
IR103	< 55	0
IR105	< 55	0
IR123	< 55	0
IR124	< 55	0
IR139	< 55	0
SR228	< 55	0
SR270	< 55	0
Brady North MOA	< 55	3
Brady South Low MOA	< 55	1
Brady South High MOA	< 55	2
Brownwood MOA	< 55	1
Falcon Range (R-5601C/D/E [3])	58.2	3

Notes:

1. Noise levels shown for the MTRs are at the route centerline.
2. SEL values are rounded.
3. The noise levels shown for Falcon Range are for R-5601C, D, and E combined.

As discussed in **Section 3.3.1**, an L_{dnmr} of 55 dBA is adequate to protect human health and welfare with an adequate margin of safety. As shown in **Table 3-4**, L_{dnmr} levels for the MTRs and MOAs would be less than 55 dBA for the forecasted scenario. In addition, under the forecasted scenario only the L_{dnmr} levels for IR103 and Brady South Low MOA would exceed the ambient sound level of approximately 44 dBA. The L_{dnmr} levels at Falcon Range for all three operational scenarios would exceed 55 dBA. However, none of the L_{dnmr} levels for the 301 FW managed airspace would exceed the threshold of 65 dBA required for land use planning.

Due to the approximately 43 percent increase in annual operations from the Proposed Action to the forecasted scenario, the forecasted scenario would further increase the likelihood that a high-speed aircraft flyover would startle a noise sensitive receptor underneath the airspace as compared to the Proposed Action. The same rules governing standoff distances (i.e., AFI 11-202 and FAR Part 91-119) discussed above for the Proposed Action would continue to be observed if the forecasted scenario were implemented.

Based on annoyance factors correlated to aircraft noise (see **Table 3-3**), less than 12 percent of people living under the 301 FW managed airspace would be expected to be highly annoyed upon hearing aircraft operations. As shown in **Table 3-4**, under the forecasted scenario no events per month above an SEL of 65 dBA would be expected for the areas underlying the MTRs. Under the forecasted scenario, the number of SEL events above 65 dBA would increase in the areas underlying the MOAs and Falcon Range as compared to baseline conditions and the Proposed Action. The number of SEL events above 65 dBA in the MOAs and Falcon Range would increase under the forecasted scenario as follows:

- Brady North MOA: 1 per month under baseline conditions and the Proposed Action to 3 per month under the forecasted scenario
- Brady South Low MOA: 0 per month under baseline conditions and the Proposed Action to 1 per month under the forecasted scenario
- Brady South High MOA: 1 per month under baseline conditions and the Proposed Action to 2 per month under the forecasted scenario
- Brownwood MOA: 0 per month under baseline conditions and the Proposed Action to 1 per month under the forecasted scenario
- Falcon Range: 2 per month under baseline conditions to 3 per month under the Proposed Action and forecasted scenario.

The airspace managed by 301 FW is currently in use, so intermittent aircraft overflights in these areas are already occurring. Therefore, it is expected that these increases in SEL events above 65 dBA for the forecasted scenario would have negligible long-term impacts on the areas underlying the MOAs and Falcon Range.

The same analysis methodology used above for the Proposed Action was used to predict the maximum cumulative L_{dnmr} levels at locations where MTRs cross, or where MTRs overlap in an area underlying the MOAs. The same two areas in the 301 FW managed airspace that were analyzed for potential cumulative L_{dnmr} levels under the Proposed Action were also analyzed for the forecasted scenario. These two areas are as follows:

1. Where VR104 (segment I-J) and VR1137 (segment H-I) overlap with Falcon Range (as shown in **Figures A-8** and **A-15**).
2. Where IR124 (segment F-G) and VR186 (segment F-G) overlap with the Brady South Low MOA (as shown in **Figures A-5** and **A-11**).

Neither of these areas would be expected to result in a cumulative L_{dnmr} level above 65 dBA for the forecasted scenario; however, the first area would result in a cumulative L_{dnmr} level above 55 dBA. For the first area (VR104, VR1137, and Falcon Range) that was analyzed, the cumulative L_{dnmr} level associated with baseline conditions would be approximately 56.2 dBA, the cumulative L_{dnmr} level associated with the Proposed Action would be approximately 57.3 dBA, and the cumulative L_{dnmr} level associated with the forecasted scenario would be approximately 58.1 dBA. Therefore, the cumulative

L_{dnmr} level for the first area under the forecasted scenario would be an approximate 4 percent increase above baseline conditions, and an approximate 1 percent increase above conditions under the Proposed Action. For the second area that was analyzed, the cumulative L_{dnmr} level associated with baseline conditions would be approximately 44.8 dBA, the cumulative L_{dnmr} level associated with the Proposed Action would be approximately 46.4 dBA, and the cumulative L_{dnmr} level associated with the forecasted scenario would be approximately 49.3 dBA. Therefore, the cumulative L_{dnmr} level for the second area under the forecasted scenario would be an approximate 10 percent increase above baseline conditions, and an approximate 6 percent increase above conditions under the Proposed Action. Since the cumulative L_{dnmr} levels under the forecasted scenario for both areas would be below 65 dBA, there would be no increased impact on the acoustical environment in these areas as a result of overlapping airspace components. Long-term intermittent minor adverse impacts on the acoustical environment would be expected to continue as a result of the aircraft noise associated with the forecasted scenario.

3.4 Land Use

3.4.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions.

Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity and its "permanence."

3.4.2 Description of the Affected Environment

NAS JRB Fort Worth encompasses 1,805 acres in north-central Texas in Tarrant County. The airspace managed by the 301 FW extends north to El Reno, Oklahoma, approximately 50 miles to the east of the City of Dallas; extends west approximately 40 miles southeast of the City of Odessa, Texas; and extends south approximately 15 miles from the Texas-Mexico border (see **Appendix A** for a general location map as well as maps for each MTR, MOA, and Falcon Range). The 301 FW managed airspace encompasses airspace in portions of 68 counties: 19 in Oklahoma and 49 in Texas.

Most of the land underlying the MTRs, MOAs, and Falcon Range is undeveloped, and is classified as forested or agricultural with some open water areas (USGS 2001). Small areas of developed land underlie several of the routes and include the southeastern portion of Oklahoma City, Oklahoma (i.e., MTRs VR1128 and VR1137); the City of Brownwood, Texas (i.e., Brownwood MOA); and the City of

Lawton in Oklahoma (i.e., Falcon Range). Land use in these areas is classified as developed low-intensity or developed medium-intensity (USGS 2001). In addition to these land uses, 11 state and Federal parks underlie the various tracts and are listed in **Table 3-5**.

Table 3-5. Parks Underlying 301 FW Managed Airspace

State or Federal Park	Airspace Areas
Cleburne State Park	VR1124
Colorado Bend State Park	VR101
Fort Richardson State Park	IR103 IR105
Lake Mineral Wells State Park	SR228 SR270
Lake Brownwood State Park	Brownwood MOA
Little River State Park	VR1128 VR1137
Meridian State Park	VR1124
Possum Kingdom State Park	SR270 VR118
Quartz Mountain State Park	IR105
South Llano River State Park	IR123 VR143
Wichita Mountains National Wildlife Refuge	IR105 VR104 VR1137 Falcon Range

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. Therefore, compatible land development is essential to the sustained operation of the military installation. In order to foster a relationship between local governments and NAS JRB Fort Worth, and to encourage compatible land use development, a Joint Land Use Study (JLUS) was completed in 2003. The JLUS was written in cooperation with the North Central Texas Council of Governments, including the cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, and the County of Tarrant. The purpose of the JLUS was to evaluate the implementation of recommendations in the 2002 Air Installation Combat Use Zone Study and to recommend actions that will improve the compatibility of current and future land use surrounding NAS JRB Forth Worth (NCTCG 2008). The JLUS only considers land immediately surrounding NAS JRB Fort Worth and does not address all of the airspace managed by the 301 FW.

3.4.3 Environmental Consequences

The significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use impact would be significant if any of the following were to happen:

- Be inconsistent or in noncompliance with existing land use plans or policies
- Preclude the viability of existing land use
- Preclude continued use or occupation of an area
- Be incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

Proposed Action

The Proposed Action would not involve changes in land use and would not preclude the viability of existing land use. There would be an estimated increase of one SEL event per month above 65 dBA at Falcon Range as compared to the baseline scenario, which would result in negligible long-term impacts from aircraft overflights (see **Section 3.3.3**). However, the maximum estimated L_{dnmr} level at Falcon Range would be below 65 dBA. As discussed in **Section 3.3.1**, sound levels below an L_{dnmr} of 65 dBA are considered compatible with all land uses. In addition, there would not be an increase in estimated L_{dnmr} levels greater than 65 dBA from aircraft operations in any of the airspace analyzed for the 301 FW. As a result, the Proposed Action would not be incompatible with the existing land use.

No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions. The 301 FW would continue to use the current inventory of aircraft and aircraft operations would remain unchanged in the associated airspace.

Cumulative Impacts

As discussed in **Section 2.1**, the forecasted operations presented in **Table 2-1** include the operations shown as part of the Proposed Action. The forecasted scenario would not involve changes in land use and would not preclude the viability of existing land use. Under the forecasted scenario, there would be an estimated increase of one SEL event per month above 65 dBA at Brady South Low MOA, Brady South High MOA, and Brownwood MOA as compared to baseline conditions and the Proposed Action, an estimated increase of one SEL event per month at Falcon Range as compared to baseline conditions, and an estimated increase of two SEL events per month at Brady North MOA as compared to baseline conditions and the Proposed Action. It is expected that these increases in SEL events above 65 dBA for the forecasted scenario would result in negligible long-term impacts from aircraft overflights (see **Section 3.3.3**). However, the maximum estimated L_{dnmr} level for these areas would be expected to be below 65 dBA for all three scenarios analyzed. As discussed in **Section 3.3.1**, sound levels below an L_{dnmr} of 65 dBA are considered compatible with all land uses. In addition, there would not be an increase in estimated L_{dnmr} levels greater than 65 dBA from aircraft operations in any of the airspace analyzed for the 301 FW. As a result, the forecasted scenario would not be incompatible with the existing land use.

3.5 Air Quality

3.5.1 Definition of the Resource

The air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), micrograms per cubic meter ($\mu g/m^3$), or milligrams per cubic meter (mg/m^3).

The Clean Air Act (CAA) directed USEPA to develop National Ambient Air Quality Standards (NAAQS) for pollutants that have been determined to affect human health and the environment. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulates equal to or less than 10 microns in diameter [PM_{10}] and particulates equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS are ambient air quality standards to protect the public health; secondary NAAQS specify levels of air quality to protect the public welfare such as effects on vegetation, crops, wildlife, economic values, and visibility.

The USEPA designates any area that does not meet the national primary or secondary ambient air quality standard for a criteria pollutant as a nonattainment area. For O_3, each designated nonattainment area is classified as marginal, moderate, serious, severe, or extreme, based on ambient O_3 concentrations. In the State of Texas, the Texas Commission on Environmental Quality (TCEQ) has responsibility, and in the State of Oklahoma, the Oklahoma Department of Environmental Quality (ODEQ) has responsibility for implementation of the Federal CAA.

The States of Texas and Oklahoma have adopted the NAAQS for criteria pollutants. The State of Texas has adopted the NAAQS and titled them the Texas Ambient Air Quality Standards. No additional state ambient air quality standards have been promulgated by the State of Texas or Oklahoma. **Table 3-6** presents the primary and secondary USEPA NAAQS.

These programs are detailed in State Implementation Plans (SIPs), which are required to be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the nonattainment area into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA. USEPA has delegated the authority for ensuring compliance with the NAAQS to TCEQ and ODEQ.

USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. All areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS, nonattainment indicates that criteria pollutant levels exceed NAAQS, maintenance indicates that an area was previously designated nonattainment but is now in attainment, and unclassified means that there is not enough information to appropriately classify an AQCR, so the area is considered in attainment.

Federal Prevention of Significant Deterioration (PSD) regulations designate areas nationwide based on their air quality status relative to the NAAQS. PSD areas are categorized as Class I, II, or III. The classification of an area determines the maximum increase in pollutant concentrations, or "increment" of air quality deterioration, allowed over a baseline air quality concentration. Class I areas have the small increments and therefore allow the least amount of air quality deterioration. Class I areas are generally locations that have remained untouched by industry, such as parks or wilderness areas. Conversely, Class III areas have the largest air quality increments and allow the greatest deterioration. Regardless of the size of the increment, the NAAQS may not be violated in a PSD area (40 CFR 51 and 52).

Table 3-6. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Standard	
		Primary	Secondary
O_3	1 Hour [a]	----	Same as Primary Standard
	8 Hours [b]	0.08 ppm (157 µg/m^3)	
	8 Hours	0.075 ppm [g]	
PM_{10}	24 Hours [c]	150 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean [d]	----	
$PM_{2.5}$	24 Hours [e]	35 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean [f]	15 µg/m^3	
CO	8 Hours [c]	9.0 ppm (10 mg/m^3)	None
	1 Hour [c]	35 ppm (40 mg/m^3)	
NO_2	Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	Same as Primary Standard
SO_2	Annual Arithmetic Mean	0.030 ppm (80 µg/m^3)	----
	24 Hours [c]	0.14 ppm (365 µg/m^3)	----
	3 Hours [c]	----	0.5 ppm (1,300 µg/m^3)
Pb	Quarterly Average	1.5 µg/m^3	Same as Primary Standard

Source: USEPA 2008a

Notes:

Parenthetical values are approximate equivalent concentrations.

a. The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. As of 15 June 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.

b. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

c. Not to be exceeded more than once per year.

d. To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 µg/m^3.

e. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3.

f. To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

g. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective 27 May 2008).

Federal PSD regulations also define air pollutant emissions from proposed major stationary sources or modifications to be adverse if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's designation as Class I, II, or III [40 CFR 52.21(c)].

3.5.2 Description of the Affected Environment

The Proposed Action crosses 19 counties in Oklahoma and 49 counties in Texas, including 12 AQCRs. **Appendix E** provides a detailed description of each MTR and MOA, the county and state they are located within, the AQCRs they are within, and each county's attainment status.

As shown in **Appendix E**, only Collin, Denton, Johnson, and Parker counties in Texas are located in Federal moderate nonattainment areas for 8-hour ozone. These counties are classified as being in attainment/unclassified for all other criteria pollutants. All these counties are located within AQCR 215, Metropolitan Dallas-Fort Worth Intrastate (USEPA 2008b). All other counties under the Proposed Action are in attainment/unclassified for all criteria pollutants (USEPA 2008b).

Falcon Range, IR105, VR104, VR1128, and VR1137 all operate over the Wichita Mountains National Wildlife Refuge (NWR), which is classified as a Federal Class I area. Therefore, PSD regulations apply to the Proposed Action. Refer to **Appendix A** for maps showing these airspace operational areas in relation to the Wichita Mountains NWR.

Aircraft-specific data and emissions factors from the U.S. Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis (IERA) publication entitled *Air Emissions Inventory Guidance for Mobile Sources* (IERA 2001) and the USEPA document entitled *Commercial Aircraft 2002* (USEPA 2002) were used to estimate air quality emissions from Baseline conditions. Air quality emissions in tons per year (tpy) from the baseline airspace operations are shown in **Table 3-7**. A detailed description of air quality emissions from the Proposed Action is provided in **Appendix E**.

3.5.3 Environmental Consequences

The Federal *de minimis* threshold emissions rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. **Table 3-8** presents these thresholds, by regulated pollutant. As shown in **Table 3-8**, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

As discussed earlier, only Collin, Denton, Johnson, and Parker counties in Texas are located in Federal moderate nonattainment areas for 8-hour ozone. These counties are classified as being in attainment/unclassified for all other criteria pollutants. All other counties are in attainment/unclassified for all criteria pollutants. Regulated pollutant emissions from the Proposed Action would not contribute to or affect local or regional attainment status with the NAAQS.

Evaluation Criteria

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS "attainment" areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

Table 3-7. Baseline Emissions Estimates from Aircraft Operations

Flight Operational Area	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
VR101	0.028	0.001	0.061	0.000
VR104	0.083	0.002	0.182	0.000
VR118	2.934	0.063	0.666	0.549
VR143	0.763	0.249	7.549	0.146
VR186	2.324	2.638	12.280	1.136
VR1110	0.527	0.013	1.100	0.005
VR1124	0.167	0.006	0.374	0.001
VR1128	0.103	0.008	0.280	0.008
VR1137	0.103	0.008	0.280	0.008
IR103	1.688	0.097	2.138	0.418
IR105	0.186	0.030	0.985	0.045
IR123	0.763	0.249	7.549	0.146
IR124	2.324	2.638	12.280	1.136
IR139	0.202	0.008	0.415	0.016
SR228	0.299	0.023	0.464	0.071
SR270	0.299	0.023	0.464	0.071
Brady North MOA	0.000	0.000	0.000	0.000
Brady South Low MOA	20.905	0.682	3.303	4.271
Brady South High MOA	0.000	0.000	0.000	0.000
Brownwood MOA	0.000	0.000	0.000	0.000
Falcon Range (R-5601C/D/E)	2.261	0.745	21.322	0.593
Total	**35.958**	**7.485**	**71.693**	**8.620**
Regional Emissions	312,518	264,939	1,358,087	704,628
Percent of Regional Emissions Inventory	0.012%	0.003%	0.005%	0.001%

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

Effects on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP.

Table 3-8. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
O_3 (measured as NO_x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO_x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO_x) 100
CO	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment/ maintenance	Serious Moderate Not Applicable	70 100 100
$PM_{2.5}$ (measured directly, as SO_2, or as NO_x)	Nonattainment/ maintenance	All	100
SO_2	Nonattainment/ maintenance	All	100
NO_x	Nonattainment/ maintenance	All	100

Source: 40 CFR 93.153

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area.

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21(b)(23)(iii)).

Proposed Action

Aircraft operations for each MOA, MTR, and Falcon Range were analyzed using the data shown in **Table 2-1** and **Appendix A**. Only flight operations below the mixing layer (3,000 feet AGL) were evaluated for impacts on local and regional air quality. The mixing layer is an important meteorological parameter that affects near-surface atmospheric pollutant concentrations since it determines the volume of air into which pollutants and their precursors are emitted. Typically, the mixing layer is located around 3,000 feet AGL. Therefore, each aircraft was evaluated based on the time spent operating under the 3,000 foot AGL mixing layer.

Aircraft-specific data and emissions factors from the IERA publication entitled *Air Emissions Inventory Guidance for Mobile Sources* (IERA 2001) and the USEPA document entitled *Commercial Aircraft 2002* (USEPA 2002) were used to estimate air quality emissions from the Proposed Action. Air quality emissions associated with the proposed airspace operations are shown in **Table 3-9**. A detailed description of air quality emissions associated with the Proposed Action is provided in **Appendix E**.

Table 3-9. Proposed Action Emissions Estimates from Aircraft Operations

Flight Operational Area	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
VR101	0.028	0.001	0.061	0.000
VR104	0.083	0.002	0.182	0.000
VR118	3.002	0.071	0.824	0.568
VR143	0.707	0.274	7.960	0.162
VR186	2.257	2.902	13.046	1.233
VR1110	0.337	0.008	0.560	0.016
VR1124	0.106	0.008	0.208	0.006
VR1128	0.130	0.014	0.377	0.020
VR1137	0.130	0.014	0.377	0.020
IR103	22.323	0.550	3.801	9.066
IR105	1.447	0.081	2.155	0.508
IR123	0.707	0.274	7.960	0.162
IR124	2.257	2.902	13.046	1.233
IR139	0.244	0.014	0.523	0.030
SR128	0.337	0.028	0.490	0.091
SR270	0.337	0.028	0.490	0.091
Brady North MOA	0.000	0.000	0.000	0.000
Brady South Low MOA	40.918	2.835	11.814	14.862
Brady South High MOA	0.000	0.000	0.000	0.000
Brownwood MOA	0.000	0.000	0.000	0.000
Falcon Range (R-5601C/D/E)	4.002	0.824	23.267	0.761
Total	**79.349**	**10.830**	**87.142**	**28.829**
Regional Emissions	312,518	264,939	1,358,087	704,628
Percent of Regional Emissions Inventory	0.025%	0.004%	0.006%	0.004%

Long-term minor adverse impacts on local air quality would be expected to continue as a result of the aircraft emissions associated with the Proposed Action. As shown in **Tables 3-8**, emissions from the Proposed Action would not exceed the *de minimis* thresholds for AQCR 215 and would be less than 10 percent of the emissions inventory for the ROI (USEPA 2007).

As discussed earlier, portions of the airspace operations are currently conducted over and near Wichita Mountains NWR, which is classified as a Federal Class I area. In addition, emissions from the Proposed Action and forecasted airspace operations would be well below 10 percent of the emissions inventory for the ROI. Therefore, no adverse impacts on regional air quality would be expected to occur within or near Wichita Mountains NWR.

For a majority of counties within the ROI, General Conformity Rule requirements are not applicable. However, for those counties within AQCR 215, General Conformity Rule requirements are applicable. No General Conformity Determination is required since the emissions associated with the aircraft operations under the Proposed Action would be below *de minimis* thresholds and well below 10 percent of the emissions inventory for the ROI. In addition, no adverse impacts would occur on the air quality near and within Wichita Mountains NWR.

No Action Alternative

Under the No Action Alternative, no adverse impacts would be expected as the Proposed Action would not be implemented. Impacts from baseline flight operations would continue to affect the air quality in the ROI.

Cumulative Impacts

Long-term minor adverse impacts on local air quality would be expected to continue as a result of the aircraft emissions associated with the forecasted airspace operations. Air quality emissions associated with forecasted airspace operations are shown in **Table 3-10**. **Table 3-11** shows the emissions from baseline aircraft operations compared to the slight increase in regional criteria emissions from the Proposed Action and forecasted flight operations. As shown in **Tables 3-10** and **3-11**, emissions from the forecasted airspace operations would not exceed the *de minimis* thresholds for AQCR 215 and would be less than 10 percent of the emissions inventory for the ROI (USEPA 2007).

For a majority of counties within the ROI, General Conformity Rule requirements are not applicable. However, for those counties within AQCR 215, General Conformity Rule requirements are applicable. No General Conformity Determination is required since the emissions from forecasted airspace operations would be below *de minimis* thresholds and well below 10 percent of the emissions inventory for the ROI. In addition, no adverse impacts would occur on the air quality near and within Wichita Mountains NWR.

As shown in **Table 2-1**, implementation of the forecasted scenario would increase the total number of annual operations flown by approximately 43 percent from the annual operations under the Proposed Action. As shown in **Table 3-11**, the CO emissions associated with the forecasted scenario are higher than the CO emissions under Proposed Action. As discussed previously, only flight operations below 3,000 feet AGL were evaluated for impacts on local and regional air quality. As shown in **Appendix A**, a higher percentage of the aircraft operations under the Proposed Action are proposed to occur below 3,000 feet AGL than the aircraft operations under the forecasted scenario. Therefore, the emissions associated with the Proposed Action are higher for NO_x, VOC, and PM_{10} than the emissions for those three pollutants associated with the forecasted scenario.

Table 3-10. Forecasted Emissions Estimates from Aircraft Operations

Flight Operational Area	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
VR101	0.829	0.328	0.184	0.168
VR104	0.595	0.212	0.261	0.108
VR118	3.666	0.124	1.439	0.748
VR143	0.851	0.312	8.894	0.178
VR186	2.397	2.930	13.349	1.249
VR1110	0.564	0.017	0.964	0.019
VR1124	0.216	0.015	0.418	0.008
VR1128	0.241	0.025	0.727	0.026
VR1137	0.241	0.025	0.727	0.026
IR103	8.431	0.273	3.141	3.071
IR105	1.945	0.104	2.531	0.710
IR123	0.851	0.312	8.894	0.178
IR124	2.397	2.930	13.349	1.249
IR139	0.272	0.019	0.626	0.040
SR128	0.339	0.033	0.509	0.092
SR270	0.338	0.030	0.500	0.091
Brady High	0.000	0.000	0.000	0.000
Brady Low	27.328	1.213	10.996	5.357
Brady North	0.000	0.000	0.000	0.000
Brownwood	0.000	0.000	0.000	0.000
Falcon Range	4.835	1.117	31.880	0.915
Total	**56.333**	**10.020**	**99.387**	**14.234**
Regional Emissions	312,518	264,939	1,358,087	704,628
Percent of Regional Emissions Inventory	0.018%	0.004%	0.007%	0.002%

Table 3-11. Delta Change in Emissions Estimates from Aircraft Operations

Description	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
Baseline Aircraft Emissions	35.958	7.485	71.693	8.620
Proposed Action Aircraft Emissions	79.349	10.830	87.142	28.829
Delta Change Aircraft Emissions	+43.392	+3.344	+15.449	+20.209
Forecasted Scenario Emissions	56.333	10.020	99.387	14.234
Delta Change Aircraft Emissions	+20.375	+2.535	+27.695	+5.614

3.6 Biological Resources

3.6.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (e.g., wetlands, forests, and grasslands) in which they exist. Protected and sensitive biological resources include federally listed (endangered or threatened), proposed, and candidate species, and designated or proposed critical habitat; species protected under other Federal laws (see **Appendix B**); species of concern managed under Conservation Agreements or Management Plans; and state-listed species.

Under the Endangered Species Act (ESA) (16 U.S.C. 1536), an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The USFWS also maintains a list of species considered to be candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and might warrant protection under the Act.

3.6.2 Description of the Affected Environment

Because the Proposed Action only involves the use of airspace, the evaluation criteria for the effects of continued or increased training operations on wildlife only involve the potential impacts from potential aircraft/wildlife strikes within the airspace and noise. Therefore, for the purposes of this EA, only birds and mammals (e.g., bats) with potential to be within the subject airspace will be discussed from a potential wildlife strike perspective. Animals including birds, mammals, and reptiles and amphibians will be discussed from a potential noise impact perspective.

3.6.2.1 Wildlife

Birds. Texas is world-renowned for the variety of bird species that reside or migrate through the state to spend the winters in Central and South America. The ROI is within the North American Central Migration Flyway. Consequently, numerous species of migrant and resident bird species have potential to use the airspace in the ROI. Various wetlands, grasslands, forests, open waters (e.g., Lake Worth, Trinity River, Concho River, Colorado River, Canadian River), and shorelines of water bodies within the area provide habitat for many resident and migratory species below the 301 FW airspace, thereby creating potential for birds to be within the subject airspace. Waterfowl, wading birds, shorebirds, gulls, pigeons, grackles, raptors, doves, meadowlarks, sparrows, and other songbirds regularly occur on NAS JRB Fort Worth and in the surrounding area (NAS JRB Fort Worth 2004a).

In addition to birds regularly observed within NAS JRB Fort Worth and the surrounding region, there are also less widespread species that could potentially utilize the habitats found within the ROI. At least 36 bird species listed in USFWS's *Birds of Conservation Concern 2002* require habitat that could be included within the ROI (see **Table 3-12**). The ROI spans over three bird conservation regions, including the Central Mixed-Grass Prairie, Edwards Plateau, and Oaks and Prairies (USFWS 2002).

Table 3-12. USFWS Birds of Conservation Concern that Might Occur in the ROI

Scientific Name	Common Name	Habitat
Aimophila cassinii	Cassin's sparrow	Arid grasslands with scattered small trees and shrubs
Aimophila ruficeps	Rufous-crowned sparrow	Successional-scrub
Ammodramus caudacutus	Le Conte's sparrow	Thick, damp grassy areas and wetlands
Ammodramus henslowii	Henslow's sparrow	Grasslands with scattered shrub
Anthus spragueii	Sprague's pipit	Short-grass prairie
Buteo swainsoni	Swainson's hawk	Grasslands, shrublands, and agricultural areas
Calcarius mccownii	McCown's longspur	Short-grass plains, plowed fields, and bare or nearly bare ground
Calcarius ornatus	Chestnut-collared longspur	Short-grass prairie, plowed field, and overgrazed pasture
Calcarius pictus	Smith's longspur	Short grassland
Charadrius alexandrinus	Snowy plover	Sand beaches, salt flats in lagoons, ponds, river bars, lakes, and ponds
Charadrius montanus	Mountain plover	Open plains, short-grass plains and fields, plowed fields, and sandy deserts
Circus cyaneus	Northern harrier	Marshes, prairies, and savannas
Egretta caerulea	Little blue heron	Inland marshes and ponds
Falco peregrinus	Peregrine falcon	Variety of habitats, most with cliffs for nesting and open areas for foraging; rural, suburban, and urban areas
Helmitheros vermivorus	Worm-eating warbler	Woodlands
Icterus spurious	Orchard oriole	Orchards, suburban areas, shrublands, along streams and lakes
Ictinia mississippiensis	Mississippi kite	Riverine forest, open woodland, and prairies near riparian woodland
Lanius excubitor	Loggerhead shrike	Open savanna and shrubland
Laterallus jamaicensis	Black rail	Salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation
Limnothlypis swainsonii	Swainson's warbler	Riparian woodland
Limosa haemastica	Hudsonian godwit	Inland marshes
Melanerpes erythrocephalus	Red-headed woodpecker	Deciduous woodlands, river bottoms, open woods, forest edges, and open wooded swamps
Numenius americanus	Long-billed curlew	Open water, prairies, and savannas
Oporornis formosus	Kentucky warbler	Riparian woodland
Passerina ciris	Painted bunting	Riparian and thorn forest, oak woodlands, savanna, brushy pastures, and hedgerows

Scientific Name	Common Name	Habitat
Passerina versicolor	Varied bunting	Arid thorn brush, riparian areas, scrub forest, canyons, and desert washes
Picoides scalaris	Ladder-backed woodpecker	Deserts and desert scrub
Pluvialis dominica	American golden-plover	Prairies and savannas
Protonotaria citrea	Prothonotary warbler	Riparian woodland
Spizella pusilla	Field sparrow	Old fields, scrubland, and forest edge
Tringa solitaria	Solitary sandpiper	Freshwater ponds, stream edges, temporary pools, wooded areas
Tryngites subruficollis	Buff-breasted sandpiper	Prairies, margins of lakes
Tyrannus forficatus	Scissor-tailed flycatcher	Grasslands , towns, agricultural areas
Vireo bellii	Bell's vireo	Dense thicket
Vireo vicinior	Gray vireo	Desert scrub, mixed juniper or pinyon pine and oak scrub, high plains scrubland
Zonotrichia querula	Harris' sparrow	Scrub, undergrowth in open woodlands and savanna, thickets, brushy fields and hedgerows

Sources: USFWS 2002, Cornell Lab of Ornithology 2003

Mammals. The only mammals with potential to occur in the airspace associated with the ROI are bats, including the Mexican free-tailed bat (*Tadarida brasiliensis*), Mexican long-nosed bat (*Leptonycteris nivalis*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), and cave myotis bat (*Myotis velifer*). These species of bats are generally crepuscular (i.e., dusk and dawn) or nocturnal feeders, although certain species may migrate during the daytime (TTU 1997).

Although they might not occur within the airspace, many land mammals could be affected by airspace operations due to noise effects. Common mammals that have the potential to occur in the ROI are shown in **Table 3-13**.

3.6.2.2 Protected and Sensitive Species

Birds. The USFWS, Texas Parks and Wildlife Department (TPWD), and Oklahoma Department of Wildlife Conservation have identified 17 threatened or endangered Federal- or state-listed birds that might occur within the ROI (USFWS 2008, TPWD 2007, TPWD 2008, and ODWC 2008) (see **Table 3-14**).

Mammals. Six Federal- or state-listed threatened or endangered mammals potentially occur within the ROI: the red wolf (*Canis rufus*), gray wolf (*Canis lupus*), Texas kangaroo rat (*Dipodomys elator*), ocelot (*Leopardus pardalis*), Mexican long-nosed bat, and Louisiana black bear (*Ursus americanus luteolus*) (see **Table 3-14**). As previously mentioned, the Mexican long-nosed bat has potential to occur within the actual airspace itself. The gray wolf has been extirpated from the State of Texas (TPWD 2007).

Table 3-13. Common Mammals in Texas and Oklahoma that Might Occur in the ROI

Scientific Name	Common Name	State
Bassariscus astutus	Ringtail	TX
Canis latrans	Coyote	TX, OK
Castor canadensis	American beaver	TX
Chaetodipus hispidus	Hispid pocket mouse	OK
Dasyppus novemcinctus	Nine-banded armadillo	OK
Didelphis virginiana	Virginia opossum	TX, OK
Dipodomys ordii	Ord's kangaroo rat	OK
Eptesicus fuscus	Big brown bat	TX, OK
Geomys bursarius	Plains pocket gopher	OK
Lasionycteris noctivagans	Silver-haired bat	TX
Lasiurus borealis	Eastern red bat	TX
Lasiurus cinereus	Hoary bat	TX
Lepus californicus	Black-tailed jackrabbit	OK
Lynx rufus	Bobcat	TX, OK
Mephitis mephitis	Striped skunk	TX, OK
Microtus pinetorum	Woodland vole	OK
Mustela frenata	Long-tailed weasel	TX
Myotis velifer	Cave myotis	OK
Neotoma floridana	Eastern woodrat	OK
Neotoma micropus	Southern plains woodrat	OK
Odocoileus virginianus	White-tailed deer	TX, OK
Ondantra zibethicus	Common muskrat	OK
Perognathus flavus	Silky pocket mouse	OK
Peromyscus attwateri	Texas mouse	OK
Peromyscus leucopus	White-footed mouse	TX, OK
Peromyscus maniculatus	Deer mouse	TX, OK
Procyon lotor	Common raccoon	TX, OK
Reithrodontomys fulvescens	Fulvous harvest mouse	TX, OK
Reithrodontomys montanus	Plains harvest mouse	OK
Sciurus carolinensis	Eastern gray squirrel	OK
Sciurus niger	Eastern fox squirrel	OK
Sigmodon hispidus	Hispid cotton rat	TX, OK
Spermophilus tridecemlineatus	Thirteen-lined ground squirrel	OK
Sylvilagus aquaticus	Swamp rabbit	OK

Scientific Name	Common Name	State
Sylvilagus audubonni	Desert cottontail	OK
Sylvilagus floridanus	Eastern cottontail	TX, OK
Tadarida brasiliensis	Brazilian free-tailed bat	TX, OK
Tamias striatus	Eastern chipmunk	OK
Taxidea taxus	American badger	OK
Urocyon cinereoargenteus	Common gray fox	TX, OK

Sources: TPWD 2007, ASM 2008
Notes:
TX = Texas
OK = Oklahoma

Reptiles and Amphibians. Five Federal-or state-listed threatened or endangered reptiles have potential to occur within the ROI: the timber rattlesnake (*Crotalus horridus*), indigo snake (*Drymarchon corais*), brazos water snake (*Nerodia harteri*), concho water snake (*Nerodia paucimaculata*), and Texas horned lizard (*Phrynosoma cornutum*) (see **Table 3-14**).

3.6.2.3 Protected and Sensitive Habitats

Critical habitat is defined in the ESA as specific geographic areas that contain features essential for the conservation of a threatened or endangered species and that might require special management and protection. Critical Habitat can include an area that is not currently occupied by the species but that will be needed for its recovery. The 301 FW airspace components overlie two areas with designated Critical Habitat in Texas and Oklahoma.

Texas. IR124 and the Brownwood MOA are situated over a USFWS- designated Critical Habitat for the Concho water snake, a federally and state-listed threatened species. This critical habitat lies within Concho, Coleman, and Runnels counties. The entire Critical Habitat area encompasses 18,674 acres covering the O.H Ivie Reservoir, a lake formed by the Colorado and Concho Rivers, and its tributaries (USFWS undated).

Oklahoma. Approximately 4,750 acres of the Canadian River is designated as Critical Habitat for the Arkansas River shiner (*Notropis girardi*), a federally and state-listed threatened species. Airspace component VR1128 crosses this habitat in Blaine, Canadian, McClain, and Pottawatomie Counties (USFWS undated).

3.6.2.4 Bird/Wildlife Aircraft Strike Hazard

The potential for a bird strike by an aircraft in the vicinity of the ROI exists due to proximity to nearby water bodies, landfills, natural habitats, and the North American Central Migration Flyway. Texas is world-renowned for the variety of bird species that reside or migrate through the state to spend the winters in Central and South America. The main groups of birds posing BASH threats are gulls, waterfowl, vultures, and raptors. The Lake Worth area hosts a large population of gulls year-round and large populations of waterfowl during winter months. Daily and seasonal movements of resident and migratory bird species create various hazardous conditions to both birds and aircraft. Reported USAF bird/aircraft strikes are on average highest during the months of May, August, September, and October, which are all large migration months (USAF 2007).

Table 3-14. Federal- and State-listed Threatened and Endangered Species that Might Occur in or Migrate Through the ROI

Scientific Name	Common Name	Federal Status	State Status
Mammals			
Canis rufus	Red wolf	E	E (TX)
Canis lupus	Gray wolf	E	E (TX)
Dipodomys elator	Texas kangaroo rat		T (TX)
Leopardus pardalis	Ocelot	E	E (TX)
Leptonycteris nivalis	Mexican long-nosed bat	E	E (TX)
Ursus americanus luteolus	Louisiana black bear	T	T (TX)
Birds			
Asturina nitida	Gray hawk		T (TX)
Buteo albonotatus	Zone-tailed hawk		T (TX)
Buteogallus anthracinus	Common black hawk		T (TX)
Charadrius melodus	Piping plover	T	T (TX, OK)
Dendroica chrysoparia	Golden-cheeked warbler	E	E (TX)
Empidonax trailii extimus	Southwestern willow flycatcher	E	E (TX)
Falco femoralis septentrionalis	Northern aplomado falcon	E	T (TX)
Falco peregrinus anatum	American peregrine falcon	DL	E (TX)
Falco peregrinus tundrius	Arctic peregrine falcon	DL	T (TX)
Grus Americana	Whooping crane	E	E (TX, OK)
Haliaeetus leucocephalus	Bald eagle	DL	T (TX)
Mycteria americana	Wood stork		T (TX)
Numenius borealis	Eskimo curlew	E	E (TX, OK)
Picoides borealis	Red-cockaded woodpecker	E	E (TX, OK)
Plegadis chihi	White-faced ibis		T (TX)
Sterna antillarum	Interior least tern	E	E (TX, OK)
Vireo atricapilla	Black-capped vireo	E	E (TX, OK)
Reptiles			
Crotalus horridus	Timber rattlesnake		T (TX)
Drymarchon corais	Indigo snake		T (TX)
Nerodia harteri	Brazos water snake		T (TX)
Nerodia paucimaculata	Concho water snake	T	T (TX)
Phrynosoma cornutum	Texas horned lizard		T (TX)

Sources: USFWS 2008, TPWD 2007, TPWD 2008, ODWC 2008

Notes:

DL = Delisted

E = Endangered

T = Threatened

TX = Texas

OK = Oklahoma

Approximately 50 percent of recorded bird strikes have been at altitudes lower than 400 feet and almost all strikes have been less than 2,500 feet (92 percent) (USAF 2007). The vast majority of bird/aircraft collisions involve common, large-body birds, particularly gulls, waterfowl, and raptors, or large flocks of smaller birds (FAA 2003). Approximately 90 percent of the birds struck by aircraft in the United States are federally protected under the Migratory Bird Treaty Act (BSC USA 2006).

A BASH Plan is in effect for NAS JRB Fort Worth to help control birds so that they do not interfere with flight operations, mainly by decreasing the airfield's attractiveness to potentially hazardous birds and attracting birds and animals away from the primary flight operations area. The BASH Plan is included as Appendix B in the *NAS JRB Fort Worth Integrated Natural Resources Management Plan* (NAS JRB Fort Worth 2004a). This Plan calls for the modification of areas surrounding the airfield by making the areas unattractive to birds, and thus resulting in less bird-aircraft collision potential; however, this BASH Plan does not and cannot account for all of the airspace utilized by the 301 FW, particularly above natural areas and private lands.

According to AFI 91-202, the following Bird Watch Condition codes are to be used to communicate local bird activity (USAF 1998):

- *Severe:* Bird activity on or immediately above the active runway or other specific location representing high potential for strikes. Supervisors and aircrews must thoroughly evaluate mission need before conducting operations in areas under condition "Severe".
- *Moderate:* Bird activity near the active runway or other specific location representing increased potential for strikes. Bird Watch Condition moderate requires increased vigilance by all agencies and supervisors and caution by aircrews.
- *Low:* Bird activity on and around the airfield representing low potential for strikes.

There have been six reported bird strikes at Falcon Range since September 2005 and one bird strike in IR104 in October 2008 (Queretaro 2008). Details of these bird strikes are provided in **Table 3-15**. No additional bird strikes have been recorded in the 301 FW managed airspace in the last 10 years (Queretaro 2008 and 2009b). According to the 301 FW bird strike data, all incidents have occurred below 4,000 feet AGL. Please note that six of the seven bird strikes were under Bird Watch Condition "Low."

In addition to threats from larger species of birds and large flocks of birds, bats also pose a BASH threat within the 301 FW airspace. Many species of bats occurring within the ROI are colonial and will feed, fly, or migrate together, creating a potentially large BASH threat. In addition, many of these bat species are aerial foragers, thereby increasing the potential amount of time spent within the airspace (TTU 1997). Although operations currently occur after sunset within the ROI, the majority of airspace altitudes for the ROI are well above the elevation at which bats generally feed (i.e., at or near treetops [TTU 1997]). No bat strikes have been recorded in the 301 FW managed airspace in the last 10 years (Queretaro 2008).

3.6.3 Environmental Consequences

Evaluation Criteria

The significance of effects on biological resources 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 proposed activities, and (4) the duration of ecological effects. A habitat perspective is used to provide a framework for analysis of general classes of effects (e.g., noise, human disturbance).

Table 3-15. Bird Strikes in the ROI Since 1998

Date	Bird Watch Condition	Bird Type	Aircraft	Time of day	Airspace Location
9/28/05	Low	Egret	F-18	Mid-afternoon	Less than 1,000 feet AGL 3 miles west of Falcon Range
12/14/05			F-18		3,000 feet above MSL at the transition between Falcon Range and airspace to the west
8/22/06			F-16		Unknown
3/13/08			CH-146		Less than 4,000 feet AGL in Falcon Range northwest of Cache, Oklahoma
4/8/08			AT-38		Less than 4,000 feet AGL in the western part of Falcon Range
9/23/08			F-16		Less than 4,000 feet AGL 4 miles west of Falcon Range while the aircraft was proceeding to Falcon Range
10/8/08	Moderate	Hawk	F-16	3:30 p.m. (1530 hours)	4,000 feet AGL on IR104

Source: Queretaro 2008, Queretaro 2009b

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals, render habitat unsuitable, or reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could have the potential to lead to population declines or local or regional extinction. Bird/animal aircraft strikes could particularly have a potential effect on a species population if that species is threatened or endangered.

Proposed Action

Short-term and potentially long-term minor to moderate direct adverse effects on wildlife would be expected to continue as a result of the aircraft operations associated with the Proposed Action. These effects are associated with noise created by the aircraft (on birds, mammals, reptiles, and amphibians) and the potential for wildlife strikes by aircraft (on birds and bats). Generally, species that live entirely below the surface of the water do not experience the same level of sound as terrestrial species (NPS 1994); therefore, the effects of noise disturbances on fish and other aquatic species have not been evaluated in this EA. Correspondence was sent to several recipients shown in **Appendix C**, including the USFWS Southwest Region (Region 2) and TPWD, soliciting comments concerning the Proposed Action and concerns of any potential environmental issues. Since this EA addresses the recommendations provided by the TPWD regarding potential impacts to wildlife resources (see **Section C**), the TWPD has no objections to the FONSI (see **Appendix D**).

Effects of Noise on Birds. Short-term minor, direct, adverse effects on birds would be expected as a result of noise disturbances from aircraft operations. High-noise events, such as low-altitude overflights, can cause birds to engage in escape or avoidance behaviors (Ellis et al. 1991), activities that could impose an energy cost and affect survival or growth over the long-term. In addition, these noise-avoidance activities diminish the time individuals have for feeding, preening, or caring for young. Nesting birds are extremely sensitive to aircraft overflights and can be flushed from their nests in response to aircraft noise,

shadow, or sight. However, they typically return shortly after the aircraft has passed. Over time, nesting birds can become more habituated to noise (Efroymson et al. 2004).

Extensive studies on raptors (Grubb and King 1991, Ellis et al. 1991), wading and shore birds (Black et al. 1984, Burger 1986), songbirds (Manci et al. 1988, USDA 1992), and red-cockaded woodpeckers (USACE 2001) have all found that birds generally exhibit short-term minor responses such as flushing, avoidance, or abnormal calls. Long-term adverse effects from overflight noise, such as decreases in reproductive success, increased mortality, or habitat abandonment, have not been shown in these studies. Most research also indicates eventual habituation to aircraft noise by avian species (NAS JRB Fort Worth 2004b).

Waterfowl have been found to be particularly disturbed by aircraft noise and migratory waterfowl have responded to disturbances more readily than other species of water birds (Manci et al. 1988). However, most species of waterfowl, if startled to the point of being flushed, quickly resume their normal activities once the aircraft has left the area. Studies measuring changes in habitat use and energetic costs have not demonstrated meaningful long-term effects. Although most studies have shown short-term effects from overflights, a study of the wood duck (*Aix sponsa*) suggested that this species did not appear to habituate to aircraft disturbance (Conomy et al. 1998). Additionally, overall reduction in geese flock sizes was observed in a study of waterfowl populations in Alaska and Canada. Recommendations in one study were made to reduce aircraft flights in the vicinity of premigration staging areas (Gunn and Livingston 1974). Both studies suggest that avian response to aircraft might be species-specific.

Effects of Noise on Mammals. Short-term minor direct adverse effects on mammals would be expected as a result of noise disturbances from aircraft operations. Studies of terrestrial mammals have shown that noise levels of 120 dBA can damage mammals' ears, and levels at 95 dBA can cause temporary loss of hearing acuity (NAS JRB Fort Worth 2004b). L_{dnmr} levels from aircraft overflights did not change noticeably from baseline conditions, as discussed in **Section 3.3.3**. The maximum cumulative L_{dnmr} level from 301 FW aircraft overflights for the Proposed Action is 57.3 dBA, well below the threshold of 65 dBA required for land use planning (FICON 1992). It has been proven that low-altitude overflights do induce stress in animals, largely detected by increased heart rates. Since these reactions are natural responses to predation, infrequent overflights might not be detrimental in and of themselves. However, flights at high frequencies over a long period of time could cause harmful effects. Aircraft disturbance might not cause obvious health effects, but when combined with an additional stressor, could have a larger adverse cumulative impact.

Studies on the effects of overflights on mammals have been focused largely on ungulates. Panic reactions have been observed in caribou herds in Alaska from flights at an altitude of 200 feet or less. Reactions decreased with increasing altitudes and panic reactions stopped at altitudes above 500 feet. Panic reactions seemed to be stronger in larger herds (NAS JRB Fort Worth 2004b). Extensive studies have been conducted on the behavioral and physiological responses of large herbivores to disturbances including overflights; however, few studies have related herbivore responses to biologically important changes, such as decreases in reproductive success or habitat use. Therefore, while large herbivores might exhibit behavioral responses to overflights, it is not known whether they are seriously affected by overflights, particularly over the long term (USDA 1992).

Noise from aircraft has affected large carnivores by causing changes in home ranges, foraging patterns, and breeding behavior. One study recommended that aircraft not be allowed to fly at altitudes below 2,000 feet AGL over important grizzly and polar bear habitat (Dulfour 1980). Wolves have been frightened by low-altitude flights between 25 to 1,000 feet AGL; however, wolves have been found to adapt to aircraft overflights and noise as long as they were not being hunted from aircraft (Dulfour 1980).

Low-altitude flyovers seem to be more disruptive in terrain where there is little cover (Manci et al. 1988, NAS JRB Fort Worth 2004b).

Several studies on the effects of overflights on small mammals, particularly rodents, have failed to find any significant effect on populations. Long-term laboratory studies of small mammals exposed intermittently to high levels of noise demonstrate no changes in longevity. The physiological "fight-or-flight" response, while exhibited, does not appear to have any long-term health consequences. Small mammals are not likely to habituate to sound levels greater than 100 dBA (USDA 1992).

Effects of Noise on Reptiles and Amphibians. Effects of overflights on amphibians and reptiles have rarely been evaluated. Since amphibians and reptiles do not exhibit a well-developed acoustic startle response, they are often regarded as nonsusceptible to noise impacts (USDA 1992).

Overall, research on the effects of noise from overflights on wildlife suggests that while overflights are often initially startling, animals eventually habituate to them under most circumstances. The intensities and durations of the startle response have been shown to decrease with numbers and frequencies of exposure, suggesting no long-term adverse effects. In addition, the L_{dnmr} levels within all of 301 FW managed airspace under the Proposed Action are well below the threshold of 65 dBA required for land use planning (see **Table 3-2**). Therefore, no significant impacts on wildlife would be expected as a result of the Proposed Action. The results of the noise analysis discussed in **Section 3.3.3** indicate that overall noise impacts do not increase above baseline conditions under the Proposed Action. Therefore, inclusion of the proposed aircraft operations is not expected to directly impact species or cause loss of habitat within the ROI.

Effects of Bird/Aircraft Strikes on Birds. Direct short-term and potentially long-term negligible to minor adverse impacts on birds would be expected to continue as a result of bird strikes from increased aircraft operations, particularly low-flying aircraft. The potential for a bird strike always exists whenever aircraft operate, particularly when operating in close proximity to the ground; however, given the fact that there have only been seven recorded bird strikes within the ROI since 1998, it appears that this potential is relatively low. The airspace area managed by the 301 FW of most concern for bird strikes would be Falcon Range (R5601C/D/E), because the majority of the bird strikes recorded in the 301 FW managed airspace in the last 10 years occurred there (i.e., six of the seven strikes, as shown in **Table 3-15**). As shown in **Appendix A**, aircraft operations at Falcon Range currently occur from anywhere between the surface and 40,000 feet above MSL. Portions of the airspace operations are conducted over Wichita Mountains NWR, which is a large source of bird populations in the area (USFWS 2009). However, flight operations are already occurring in all of the 301 FW managed airspace (including Falcon Range) and total airspace operations associated with 301 FW managed airspace would only increase by approximately 21 percent under the Proposed Action. This increase is spread over a very large area, which includes 16 MTRs, 4 MOAs, and Falcon Range; therefore, adverse impacts from increased aircraft operations at Falcon Range and the entire ROI are expected to be negligible to minor.

It is unlikely that bird strikes would result in population-level impacts unless the population of concern is threatened or endangered. If bird strikes involve threatened or endangered species, direct short-term and long-term minor to moderate adverse impacts would be expected. Bird strike data from the 301 FW does not indicate that threatened or endangered species have been struck by aircraft within the ROI (Queretaro 2009b); therefore, the likelihood of a bird/aircraft strike with a threatened or endangered species appears to be very low.

The USAF will continue its program for studying bird migrations, bird flight patterns, and past strikes to develop predictions of where and when bird/aircraft strikes might occur so that such incidents can be avoided or minimized. A key component of the USAF's program is its Avian Hazard Advisory System

(AHAS). AHAS uses the USAF's Bird Avoidance Model (BAM) as a foundation and weather radar to provide a near real-time description of bird activity that can be used by USAF pilots and flight scheduler/planners to make informed decisions when selecting flight routes. The BAM was constructed with the best available data on bird habitats, migration, and flight patterns, combined with key environmental and man-made geographic data. AHAS was created in an effort to protect human lives and equipment during air operations throughout the continental United States (USAHAS 2009). The 301 FW will also continue to record and report bird/aircraft strikes, including data on location, altitude, date, time of day, and the species of bird. Should it be determined that the increase in operations within the 301 FW managed airspace has caused a substantial increase in bird strikes and has resulted in a significant adverse impact to a species, then the 301 FW should coordinate with TPWD and the USFWS, as appropriate, to reconsider management practices that would reduce the adverse effect of continued operations to negligible or minor levels.

Effects of Bat/Aircraft Strikes on Bats. In addition to the effect on aircraft safety as a result of bat strikes, direct short-term negligible to minor adverse impacts on bats could be expected as a result of aircraft strikes. Bats are rated a top USAF wildlife strike hazard by cost and count as of January 2007. Bat strikes are ranked 20th in largest number of reported strikes (441 individuals) (USAF 2007); however, since the majority of flight operations within the ROI will occur during the daytime (see **Appendix A**), and bats are generally crepuscular (i.e., dusk and dawn) or nocturnal feeders, the potential for bat strikes within the ROI is very low. In addition, due to the large difference in altitudes of flight operations within the ROI and elevations at which bats generally feed (e.g., at or near treetops [TTU 1997]), the potential for bat strikes within the 301 FW managed airspace is also low, even at times when bats are most active. The airspace areas managed by the 301 FW that are of most concern for bat strikes would be those with altitudes as low as 100 feet AGL (e.g., IR103, IR105, IR123, IR124, IR139, VF143, VR186, and VR110) and particularly Falcon Range, which could include operations from anywhere between the surface and 40,000 feet above MSL. All other airspace components managed by the 301 FW are at altitudes of 300 feet AGL or greater. Flight operations are already occurring in these airspace areas of concern, and total airspace operations associated with 301 FW managed airspace would only increase by approximately 21 percent under the Proposed Action. This increase is spread over a very large area, which includes 16 MTRs, 4 MOAs, and the Falcon Range; therefore, adverse impacts on bats from increased operations in Falcon Range and the entire ROI are expected to be negligible to minor.

Potentially long-term minor to moderate direct adverse impacts on bats would be expected if strikes involve threatened or endangered species (e.g., the Mexican long-nosed bat, Federal and state-listed as endangered). No bat strikes have been recorded in the 301 FW managed airspace in the last 10 years (Queretaro 2008); therefore, it appears that the likelihood of a bat/aircraft strike, and particularly a threatened or endangered bat/aircraft strike, is very low.

Should it be determined that the increase in operations within the 301 FW managed airspace has caused a substantial increase in bat strikes and has resulted in a significant adverse impact to a species, then the 301 FW should coordinate with the TPWD and the USFWS, as appropriate, to reconsider management practices that would reduce the adverse effect of continued operations to negligible or minor levels.

Effects of Chaff and Flare Residual Materials on Wildlife. Training in the Brownwood and Brady MOAs currently involves the use of chaff and flares. Potential impacts of chaff and flare on biological resources can be direct (e.g., ingestion, inhalation, or mortality from fire caused by chaff or flare) and indirect (e.g., effects on water and forage quality, or habitat changes caused by fire) (USAF 2006). As discussed in **Section 3.2.2.2**, all types of flares can be used in the 301 FW managed airspace, but they are designed to burn out by the time they reach 400 feet AGL (Queretaro 2009b). Details of direct and indirect impacts on biological resources due to the use of chaff and flare include the following (USAF 2006):

- ***Ingestion.*** Negligible impacts on wildlife resulting from ingestion of materials would be expected. The release of chaff and flares results in chaff filaments, plastic sliders and caps, felt spacers, and flare wrapping material falling to the ground. Because of the nature of disposition and the low rate of application and dispersal of chaff filaments during defensive training, wildlife would have little opportunity to ingest chaff filaments or end caps. Although some chemical components of chaff are toxic at high levels, such levels could only be reached through the ingestion of many chaff bundles or billions of chaff filaments.
- ***Inhalation.*** Negligible impacts on wildlife from potential inhalation of materials would be expected. USAF chaff filament size is too large for inhalation (approximately 0.04 inches in diameter and 0.3 to 1 inch in length). Although chaff degrades over time to aluminum or silica particles on the ground, chaff fragments do not display asbestos-like characteristics or pose asbestos-like health risks. Therefore, inhalation of chaff filaments with adverse effects on wildlife is unlikely.
- ***Water and Forage Quality.*** Negligible impacts on water and forage quality would be expected. Confined aquatic habitats would only be at risk if there were large-scale accumulation and decomposition of chaff fibers or dud flairs; however, it is expected that these materials would be broadly distributed with low densities. Therefore, water quality is not expected to be impacted. The magnesium in flares can be toxic at extremely high levels (i.e., repeated and concentrated use in localized areas or several dud flares deposited in one water body). Flare ash would be dispersed over a large area and the probability of several dud flares being deposited in the same area is very unlikely; therefore, no effect of flares on water quality would be expected.
- ***Fire.*** A fire could result in short-term minor to moderate direct adverse effects. Fire risk and fire-frequency are a concern in arid environments. Ecosystem changes that might result from fire include (1) the introduction and spread of invasive and exotic plants; (2) habitat fragmentation, leading to increased vulnerability of isolated populations; and (3) increased wind erosion of soil following fire. Therefore, fires resulting from flare usage could result in direct losses and indirect negative effects. Even though a flare-caused fire would be an extremely rare event, a wind-driven fire could spread to other areas. While fires are a regular constituent of the environment of the Southwest, they can result in substantial short-term damage to habitat and can injure or kill wildlife species that are unable to escape (USAF 2006).

Given the low concentrations of expected chaff deposition under the airspace, migration of aluminum would not be expected to occur. Aluminum would likely remain inactive within the soil and plants would not be expected to uptake any increased concentrations of aluminum (USAF 2006); therefore, no additional aluminum would be expected to bioaccumulate or affect plant growth under the Proposed Action.

No Action Alternative

Under the No Action Alternative, users of the 301 FW managed airspace would continue to operate with the current inventory of aircraft and the aircraft operations would remain unchanged; however, short-term and long-term minor adverse impacts related to aircraft/wildlife strikes and noise, similar to those described for the Proposed Action, would be expected to continue as a result of continuing operations at the presently assessed level of operation.

Cumulative Impacts

As discussed in **Section 2.1**, the forecasted operations presented in **Table 2-1** include the operations shown as part of the Proposed Action. Implementation of the forecasted scenario would increase the total

number of annual operations flown by approximately 43 percent from the annual operations under the Proposed Action, and approximately 73 percent from baseline annual operations. Cumulative impacts associated with the forecasted scenario for biological resources are expected to be similar to the impacts discussed above for the Proposed Action.

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4. CUMULATIVE AND OTHER ADVERSE AFFECTS

4.1 Cumulative Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

The ROI for this EA includes all the military airspace managed by the 301 FW and the land areas directly underneath that airspace. As shown in **Table 2-1**, the 301 FW managed airspace is in Texas and Oklahoma and includes 16 MTRs, 4 MOAs, and a Restricted Area (Falcon Range). The airspace areas managed by the 301 FW are illustrated in **Figure 1-1**. Additional details of each of the airspace areas managed by the 301 FW is provided in **Appendix A**.

BRAC 2005 actions affecting facilities, functions, and personnel at NAS JRB Fort Worth were assessed in a November 2006 EA entitled, *Environmental Assessment for the Implementation of Base Realignment and Closure (BRAC) 2005 Action at Naval Air Station, Joint Reserve Base, Fort Worth, Texas* (NAS JRB Fort Worth 2006). In addition, an *Environmental Assessment of United Arab Emirates Pilot Training in F-5 Aircraft at Fort Worth Alliance Airport, Fort Worth, Texas* was recently completed (HQ AETC 2008). It analyzes the establishment of an intermediate-level pilot training program using F-5 A/B aircraft at Fort Worth Alliance Airport, Texas, for United Arab Emirates Air Force pilots. Portions of the training flights would take place within IR103, IR105, VR104, VR118, Brady MOA, Brownwood MOA, and Falcon Range (HQ AETC 2008). As of January 2009, it was anticipated that this program would be cancelled (Queretaro 2009b). Therefore, F-5 aircraft operations are not included under baseline or Proposed Action conditions in this EA, and only a small amount of F-5 operations were included in the forecasted scenario for Falcon Range only (see **Appendix A**) to account for possible future mission changes.

As discussed in **Section 2.1**, forecasted operations were included in this analysis to account for future mission changes that could be reasonably expected for users of the 301 FW managed airspace. The environmental consequences associated with the forecasted operations are presented in **Section 3** for each resource area. The breadth of the land area underlying the military airspace managed by the 301 FW poses a nearly infinite number of other actions possibly having cumulative effects with the Proposed Action; however, AFRC has not attempted to catalogue and evaluate all such actions because it is believed that no significant cumulative impacts would be expected.

As shown in **Appendix A**, the 301 FW has requested that this EA identify the effective times for all 301 FW managed airspace as being 7 a.m. to 10 p.m. (0700 to 2200 hours) local, 7 days a week, and other times by Notice to Airmen (NOTAM). As shown in **Appendix A**, operations during these hours are already occurring under baseline conditions. Under the Proposed Action and forecasted scenario, if aircraft operations were to be scheduled between 10 p.m. and 7 a.m. (2200 to 0700 hours) local, a NOTAM would be issued (Queretaro 2009b). Therefore, within the ROI, changing the effective times for all 301 managed airspace would not be expected to have any impacts.

4.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

The increase in aircraft operations would increase the use of hazardous materials, such as jet fuel, paints, and solvents, but would not impact overall management plans or capacities for handling these hazardous materials. With the increased use of hazardous materials for aircraft operations, hazardous waste would be expected to increase. This increase would not be expected to impact the management plans or capacities for handling this waste and, therefore, is not considered significant.

The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. The use of nonrenewable resources in the operations of additional aircraft would be unavoidable. Relatively small amounts of energy resources would be committed to the Proposed Action and are not considered significant.

4.3 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

The Proposed Action would not conflict with any applicable off-installation land use ordinances or designated clear zones.

4.4 Relationship Between the Short-term Use of the Environment and Long-term Productivity

Short-term uses of the biophysical components of the human environment include impacts associated with the Proposed Action that would occur over a period of less than 5 years. Long-term uses of the human environment include those impacts occurring over a period of more than 5 years, including permanent resource loss. Several kinds of activities could result in short-term resource uses that compromise long-term productivity. For example, filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in significant intensification of land use within the ROI or in the surrounding area.

4.5 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals). The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, land, and human labor resources. The use of these resources is considered to be permanent.

Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., jet fuel) that are used in the operation of aircraft. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

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APPENDIX A

AIRSPACE AND RANGE ASSETS MANAGED BY THE 301ST FIGHTER WING

Appendix A

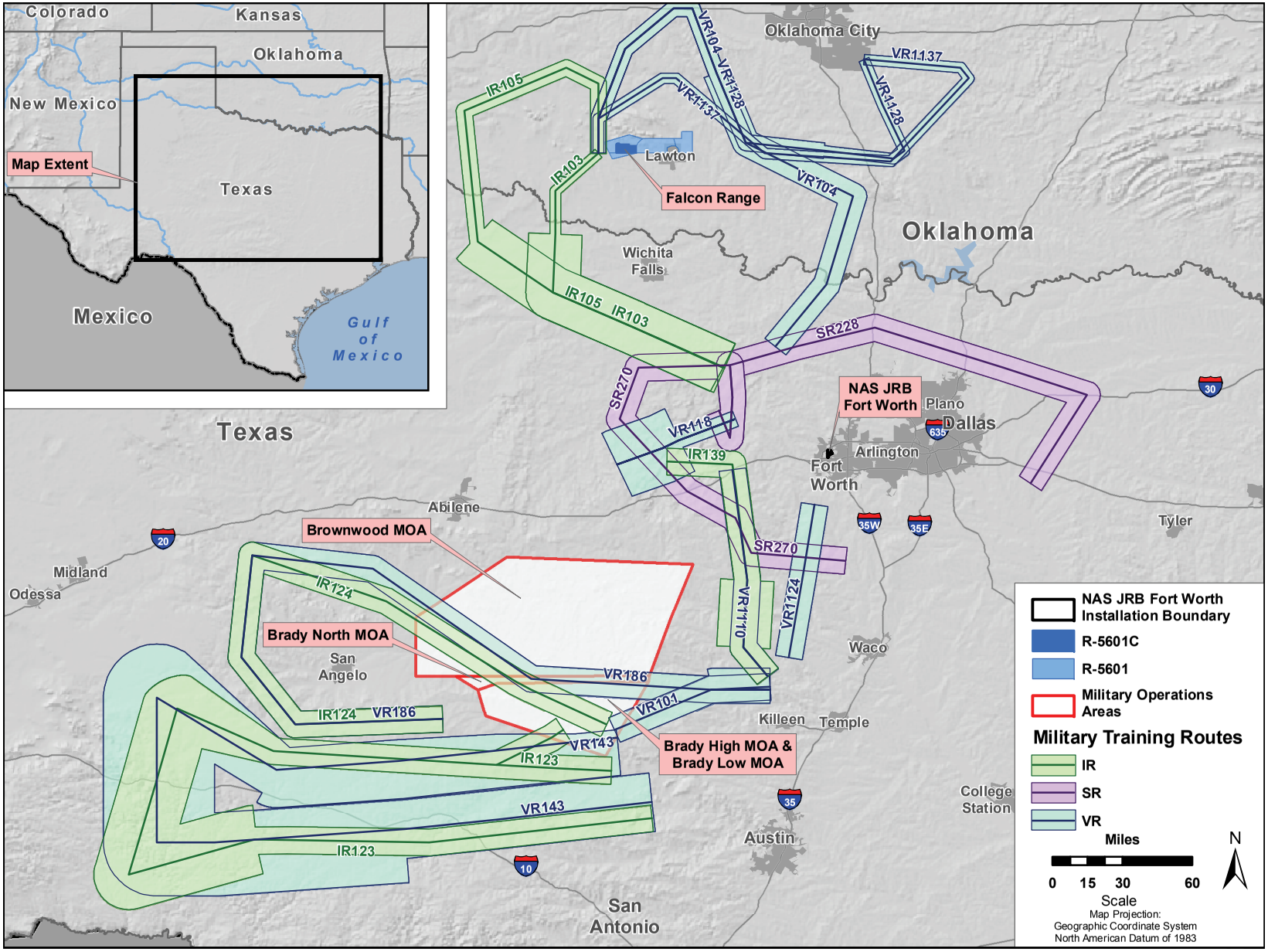
Airspace and Range Assets Managed by the 301st Fighter Wing

This Appendix provides detailed information on the Visual Routes (VRs), Instrument Routes (IRs), Slow Routes (SRs), Military Operations Areas (MOAs), and Restricted (R) airspace managed by the 301st Fighter Wing (301 FW). Annual operations assessed for each airspace component are listed in **Table A-1**. Forecasted operations are included to account for future mission changes that could be reasonably expected. An overview map of all 301 FW airspace components is shown in **Figure A-1**.

The detailed information provided in **Tables A-2** through **A-22** includes turns points for the routes and corner points for the airspace areas, the latitude and longitude of the aforementioned points, the width of the routes, and altitude structure. The information provided in **Tables A-2** through **A-17** is from the Department of Defense (DOD) publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008). The information provided in **Tables A-18** through **A-22** is from the 2008 Arc View Digital Aeronautical Flight Information File (AVDAFIF 2008).

Table A-1. Summary of Annual Operations Associated with 301 FW Managed Airspace

Airspace Component	Baseline (Pre-Base Realignment and Closure [BRAC])	Proposed Action (Post-BRAC)	Forecasted
VR101	1	20	77
VR104	25	48	108
VR118	995	1,026	1,217
VR143	373	428	580
VR186	2,145	2,637	2,680
VR1110	18	35	67
VR1124	4	13	29
VR1128	13	25	46
VR1137	13	25	46
IR103	548	717	764
IR105	46	103	140
IR123	373	428	580
IR124	2,415	2,637	2,680
IR139	18	39	54
SR228	42	53	57
SR270	42	53	55
Brady North MOA	648	870	2,792
Brady South Low MOA	1,538	1,688	2,157
Brady South High MOA	2,788	3,485	5,128
Brownwood MOA	673	948	2,930
Falcon Range (R-5601C/D/E)	2,143	2,653	3,532
Total	**14,861**	**17,931**	**25,719**



Source of Military Training Routes, MOAs, and R5601: AVDAFIF Edition 8, September 2008. Source of NAS JRB Ft. Worth Boundary: e³M, Inc. 2008

Figure A-1. Airspace and Range Assets Managed by the 301st Fighter Wing

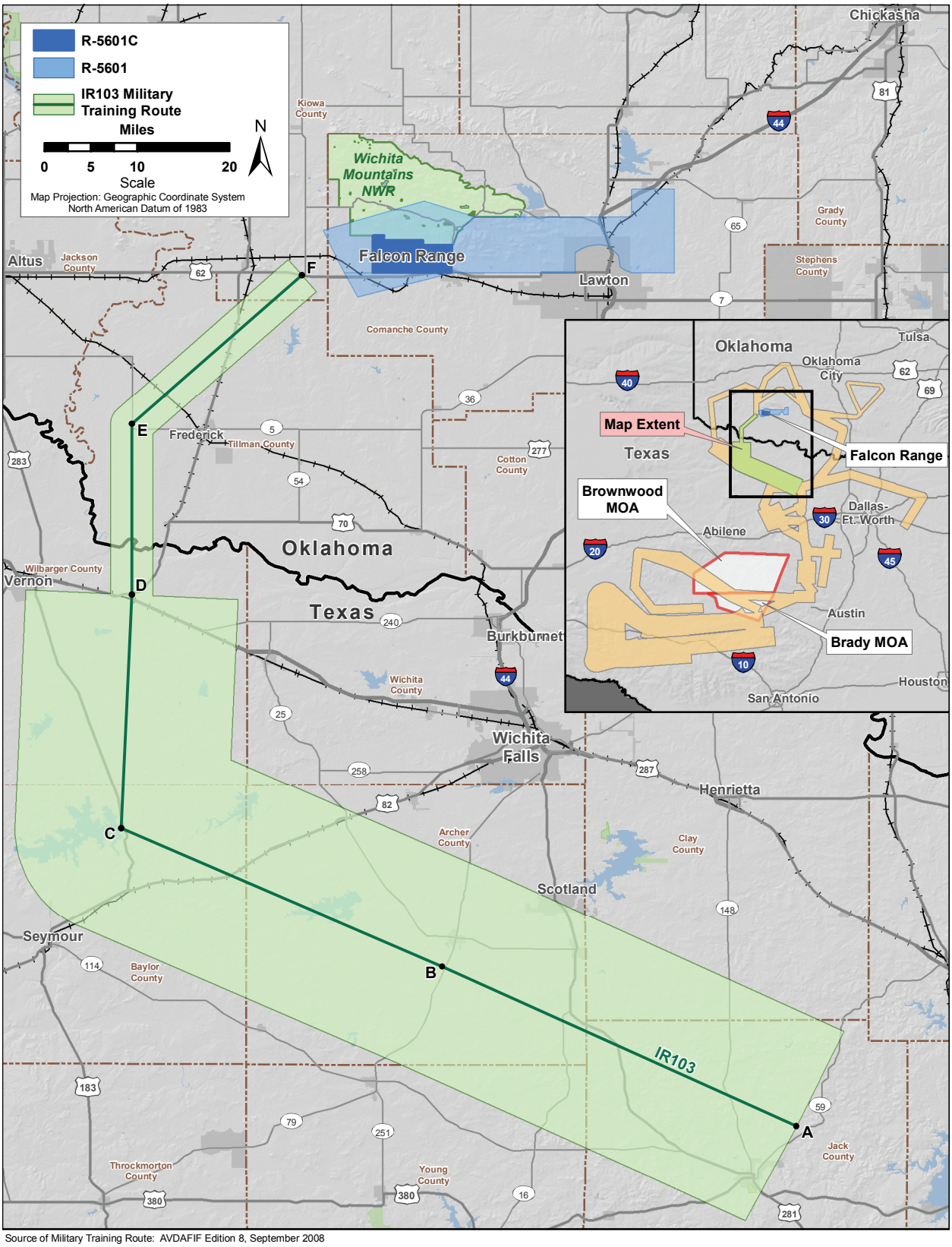
Table A-2. IR103

Turn Point	Latitude/Longitude	Width Left/Right (nautical miles [NM])	Altitude Structure (feet)
A	N 33°18.00' W 98°05.50'	10.0/10.0	500 above ground level (AGL) and 5,000 above mean sea level (MSL)
B	N 33°33.00' W 98°38.80'	10.0/10.00	500 AGL and 5,000 MSL
C	N 33°46.00' W 99°09.00'	10.0/10.00	100 AGL and 5,000 MSL
D	N 34°08.00' W 99°08.00'	2.0/2.0	300 AGL and 2,400 MSL
E	N 34°24.00' W 99°08.00'	2.0/2.0	300 AGL and 2,400 MSL
F	N 34°38.00' W 98°52.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 Operations Group (OG)/Special Use Airspace (SUA), Naval Air Station Joint Reserve Base (NAS JRB) Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (Greenwich Mean Time [GMT] +5), daily, and other times by Notice to Airmen (NOTAM)
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-2. IR103

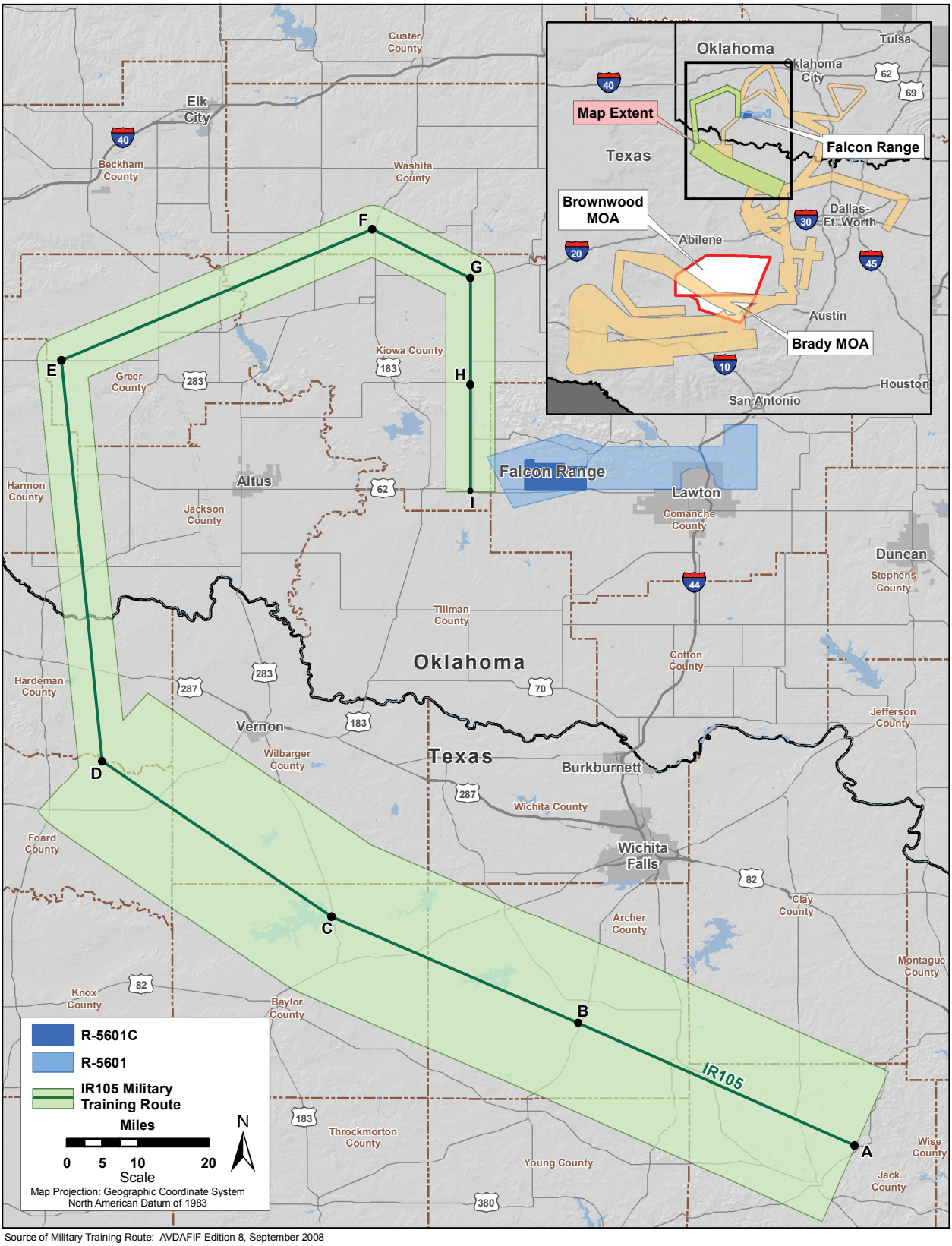
Table A-3. IR105

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 33°18.00’ W 98°05.00’	10.0/10.0	500 AGL and 5,000 MSL
B	N 33°33.00’ W 98°38.80’	10.0/10.00	100 AGL and 5,000 MSL
C	N 33°46.00’ W 99°09.00’	10.0/10.00	100 AGL and 5,000 MSL
D	N 34°05.00’ W 99°37.00’	3.0/3.0	100 AGL and 3,000 MSL
E	N 34°54.00’ W 99°42.00’	3.0/3.0	300 AGL and 3,500 MSL
F	N 35°10.00’ W 99°04.00’	3.0/3.0	300 AGL and 3,500 MSL
G	N 35°04.00’ W 98°52.00’	3.0/3.0	300 AGL and 3,500 MSL
H	N 34°51.00’ W 98°52.00’	3.0/3.0	2,400 AGL and 7,000 MSL
I	N 34°38.00’ W 98°52.00’	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-3. IR105

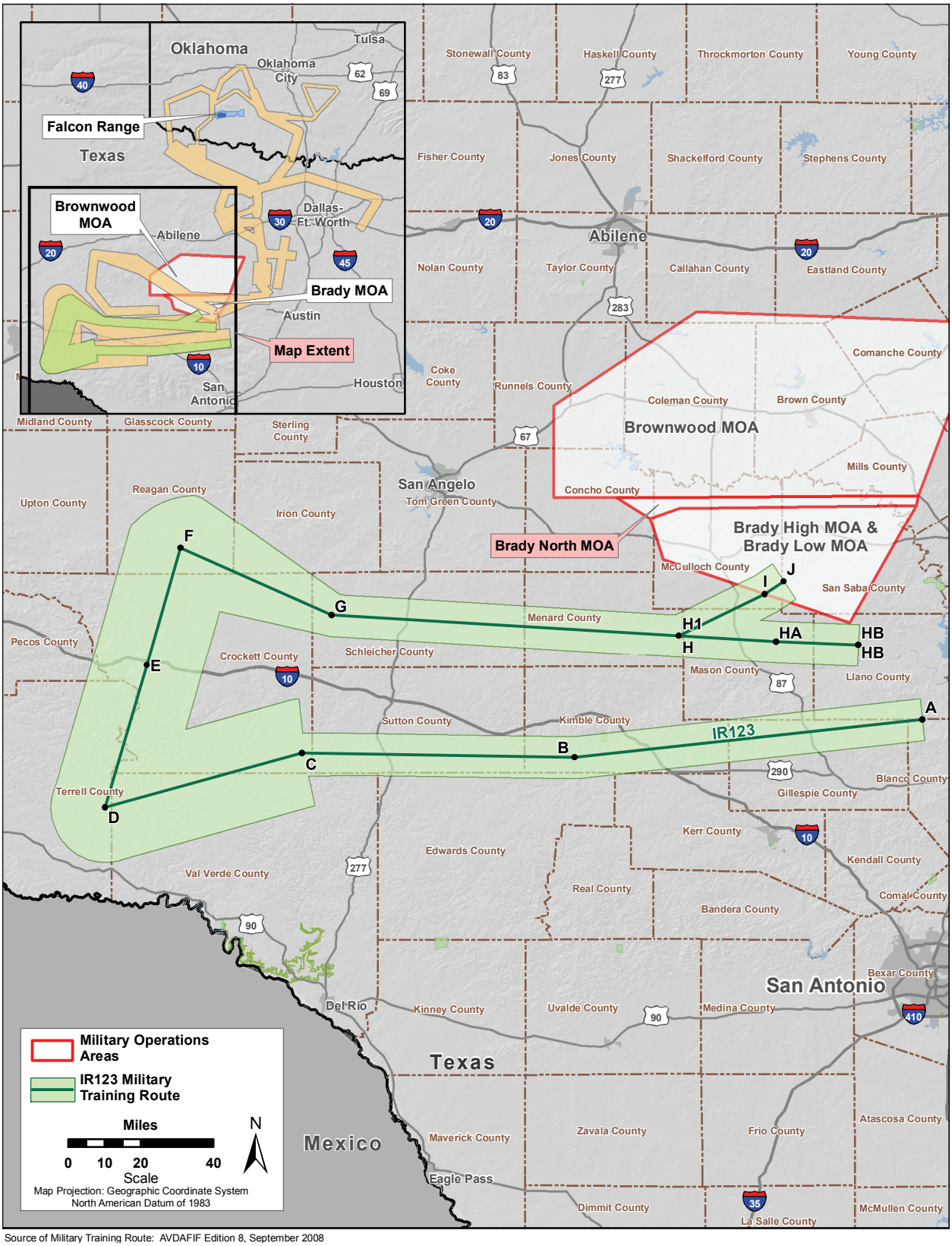
Table A-4. IR123

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 30°30.00' W 98°32.00'	5.0/5.0	500 AGL and 5,000 MSL
B	N 30°21.00' W 99°55.00'	5.0/5.0	500 AGL and 5,000 MSL
C	N 30°22.00' W 101°00.00'	13.0/13.00	100 AGL and 5,000 MSL
D	N 30°09.00' W 101°47.00'	13.0/13.0	100 AGL and 6,000 MSL
E	N 30°43.00' W 101°37.00'	13.0/13.0	100 AGL and 5,000 MSL
F	N 31°11.00' W 101°29.00'	13.0/13.0 Tapers to 5 NM each side	500 AGL and 5,000 MSL
G	N 30°55.00' W 100°53.00'	5.0/5.0	500 AGL and 6,000 MSL
H	N 30°50.00' W 99°30.00'	5.0/5.0	500 AGL and 6,000 MSL Alternate Exit Point
I	N 31°00.00' W 99°09.50'	5.0/5.0	500 AGL and 6,000 MSL
J	N 31°03.00' W 99°05.00'	Exit Point	
H1	N 30°50.00' W 99°30.00'	5.0/5.0	500 AGL and 6,000 MSL to Climb to Point HA
HA	N 30°48.60' W 99°06.90'	5.0/5.0	11,000 MSL and (Contact Houston Air Route Traffic Control Center [ARTCC])
HB	N 30°47.78' W 98°47.24'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-4. IR123

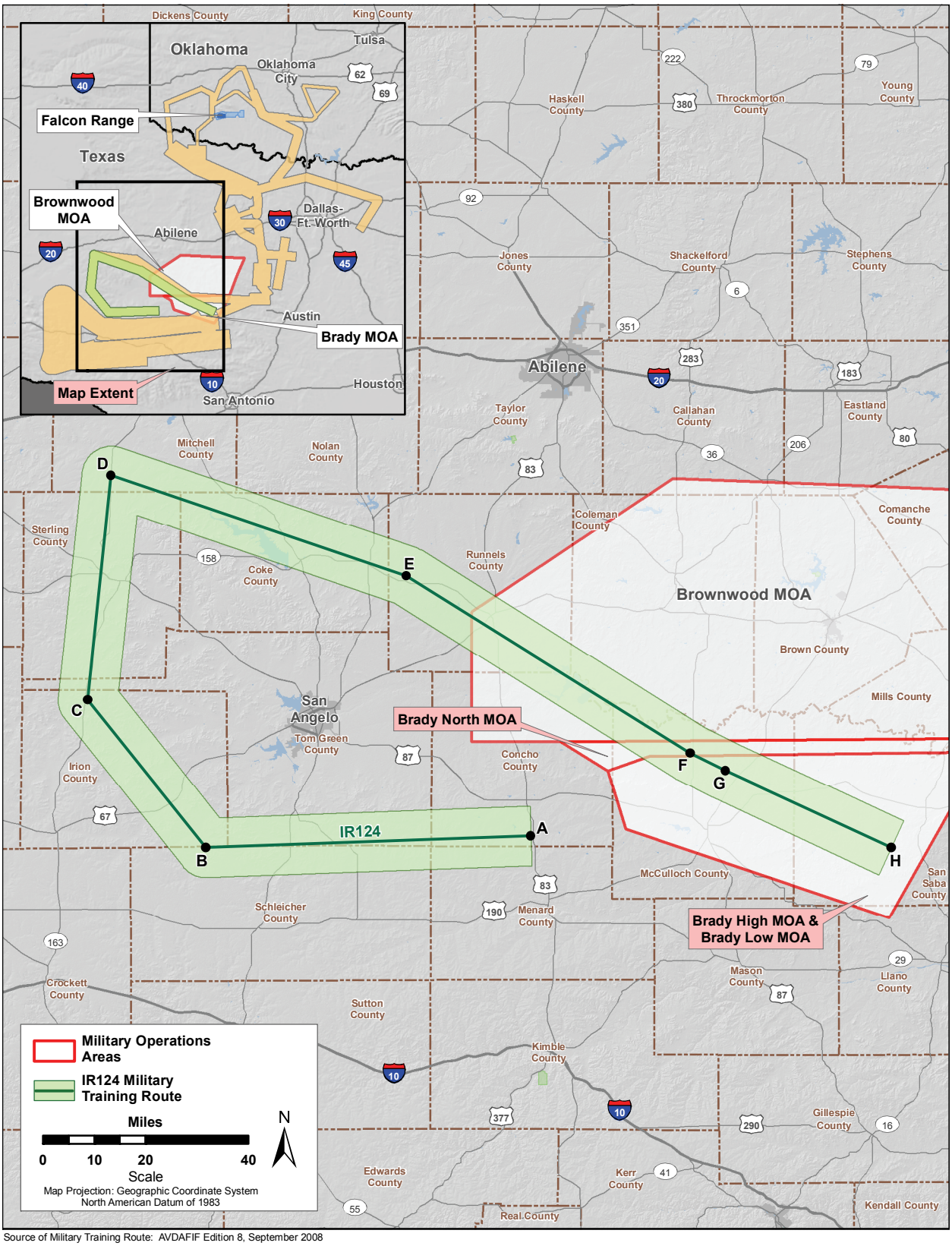
Table A-5. IR124

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 31°07.00' W 99°50.00'	5.0/5.0	500 AGL and 4,000 MSL
B	N 31°05.00' W 100°45.00'	5.0/5.0	100 AGL and 4,000 MSL
C	N 31°30.00' W 101°05.00'	5.0/5.0	100 AGL and 4,000 MSL
D	N 32°08.00' W 101°01.00'	5.0/5.0	500 AGL and 5,000 MSL
E	N 31°51.00' W 100°11.00'	5.0/5.0	500 AGL and 5,000 MSL
F	N 31°21.00' W 99°23.00'	5.0/5.0	500 AGL and 6,000 MSL
G	N 31°18.00' W 99°17.00'	5.0/5.0	500 AGL and 6,000 MSL
H	N 31°05.00' W 98°49.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-5. IR124

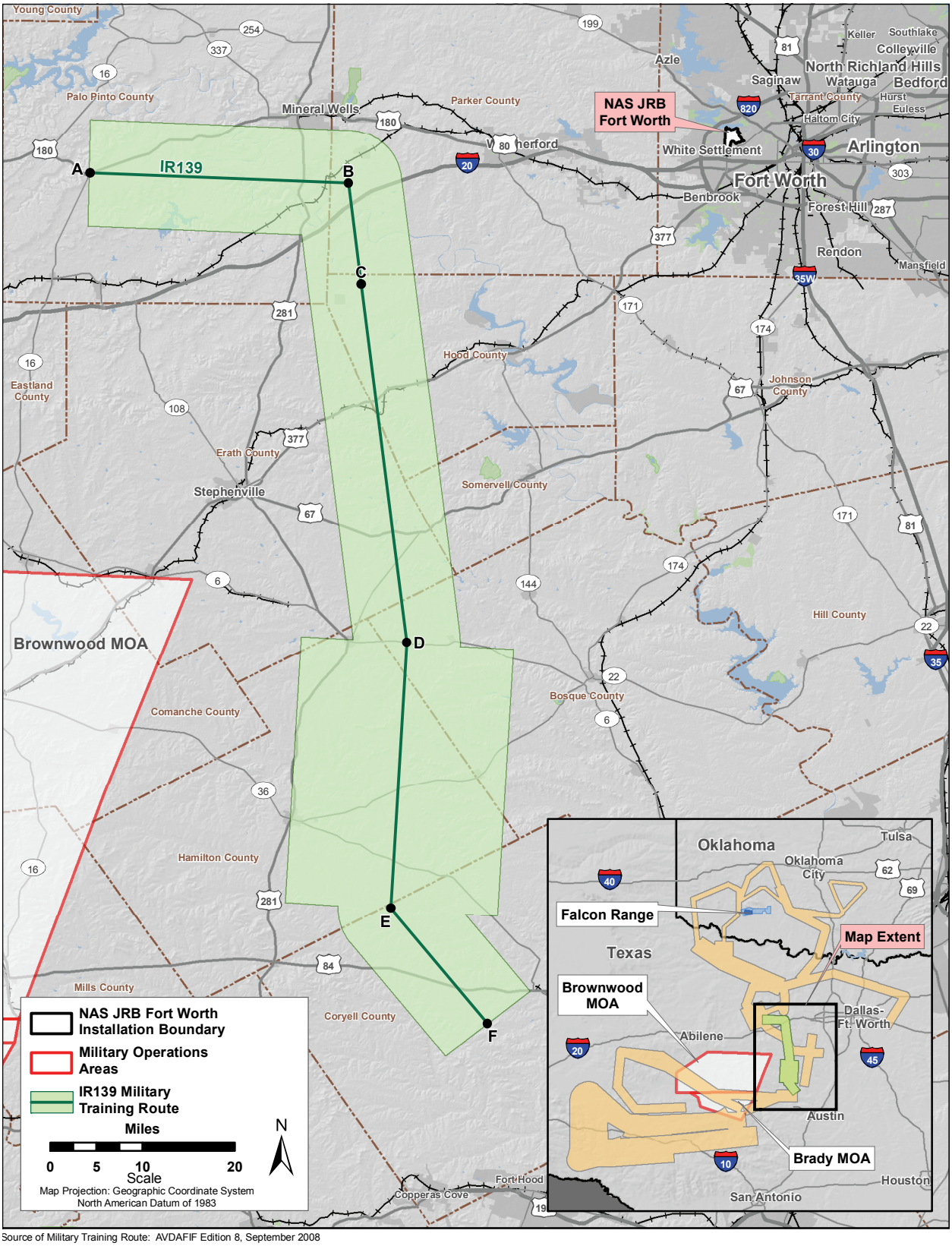
Table A-6. IR139

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 32°43.00' W 98°26.30'	5.0/5.0	500 AGL and 3,000 MSL
B	N 32°42.00' W 98°02.00'	5.0/5.0	500 AGL and 3,000 MSL
C	N 32°32.50' W 98°00.80'	5.0/5.0	100 AGL and 3,000 MSL
D	N 31°58.80' W 97°56.50'	10.0/10.0	100 AGL and 6,000 MSL
E	N 31°33.80' W 97°58.00'	5.0/5.0	1,000 AGL and 6,000 MSL
F	N 31°23.00' W 97°48.90'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-6. IR139

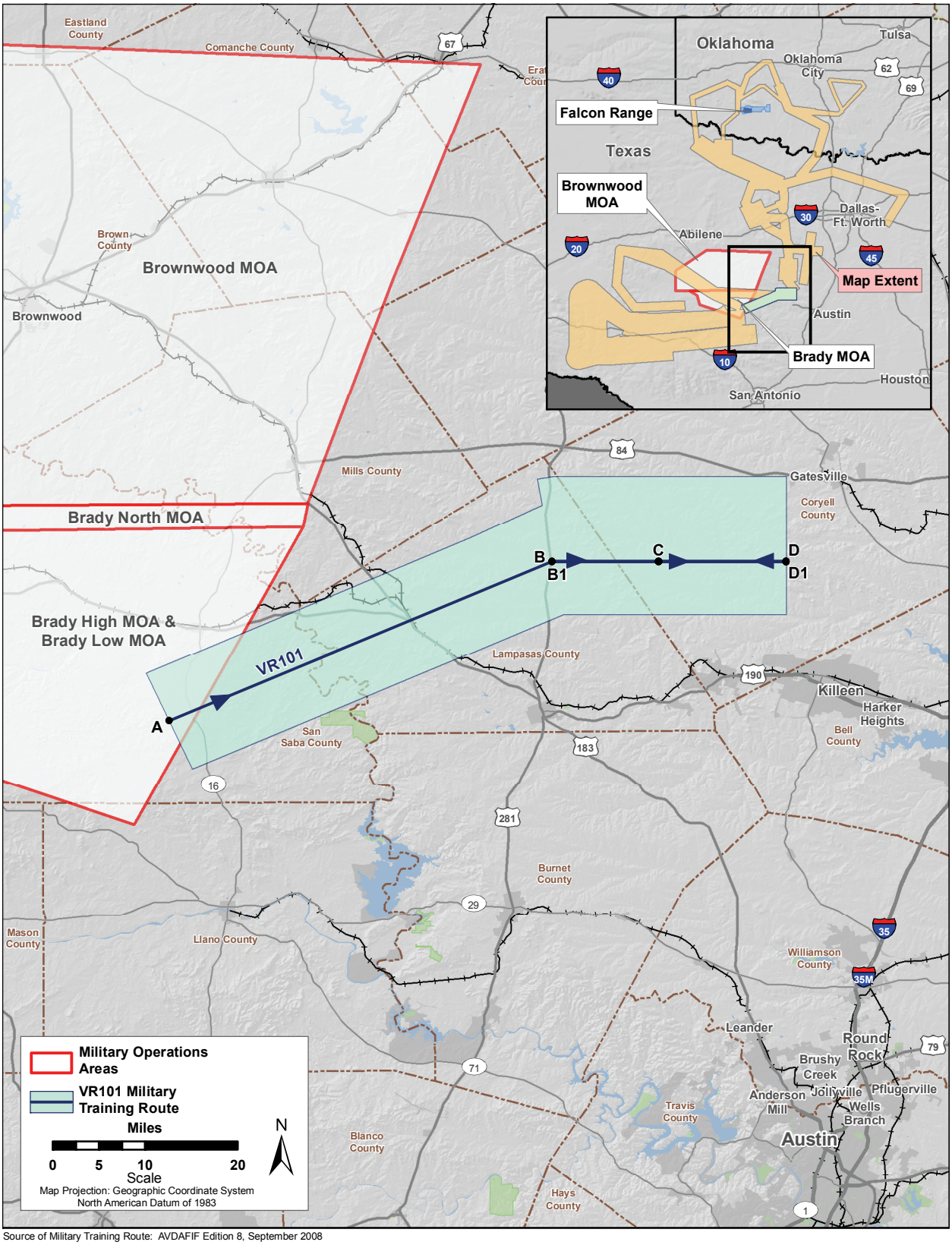
Table A-7. VR101

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 31°03.00’ W 98°46.00’	5.0/5.0	500 AGL and 4,000 MSL
B	N 31°18.00’ W 98°10.00’	8.0/5.0	1,000 AGL and 4,000 MSL
C	N 31°18.00’ W 98°00.00’	8.0/5.0	1,000 AGL and 4,000 MSL
D	N 31°18.00’ W 97°48.00’	8.0/5.0	1,000 AGL and 4,000 MSL
D1	N 31°18.00’ W 97°48.00’	8.0/5.0	1,000 AGL to 4,000 MSL to Left at D1
B1	N 31°18.00’ W 98°10.00’	8.0/5.0	3,000 MSL to Avoid North Fort Hood and Gatesville
		Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-7. VR101

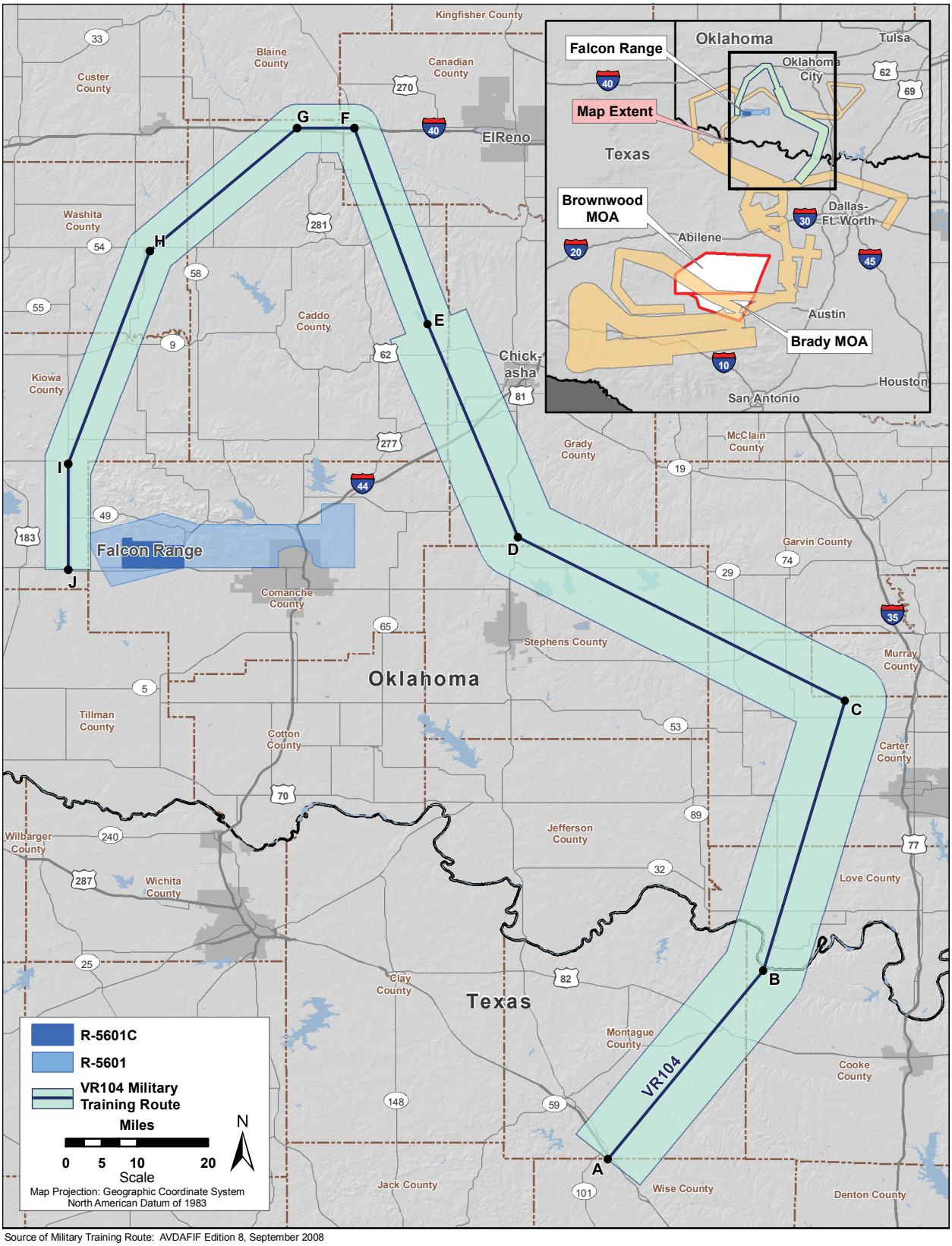
Table A-8. VR104

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 33°26.00' W 97°46.00'	5.0/5.0	300 AGL and 3,500 MSL
B	N 33°49.00' W 97°27.00'	5.0/5.0	300 AGL and 3,500 MSL
C	N 34°22.00' W 97°17.00'	5.0/5.0	300 AGL and 3,500 MSL
D	N 34°42.00' W 97°57.00'	5.0/5.0	300 AGL and 3,500 MSL
E	N 35°08.00' W 98°08.00'	3.0/3.0	300 AGL and 3,500 MSL
F	N 35°32.00' W 98°17.00'	3.0/3.0	300 AGL and 3,500 MSL
G	N 35°32.00' W 98°24.00'	3.0/3.0	300 AGL and 3,500 MSL
H	N 35°17.00' W 98°42.00'	3.0/3.0	300 AGL and 3,500 MSL
I	N 34°51.00' W 98°52.00'	3.0/3.0	2,400 MSL and 10,000 MSL
J	N 34°38.00' W 98°52.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-8. VR104

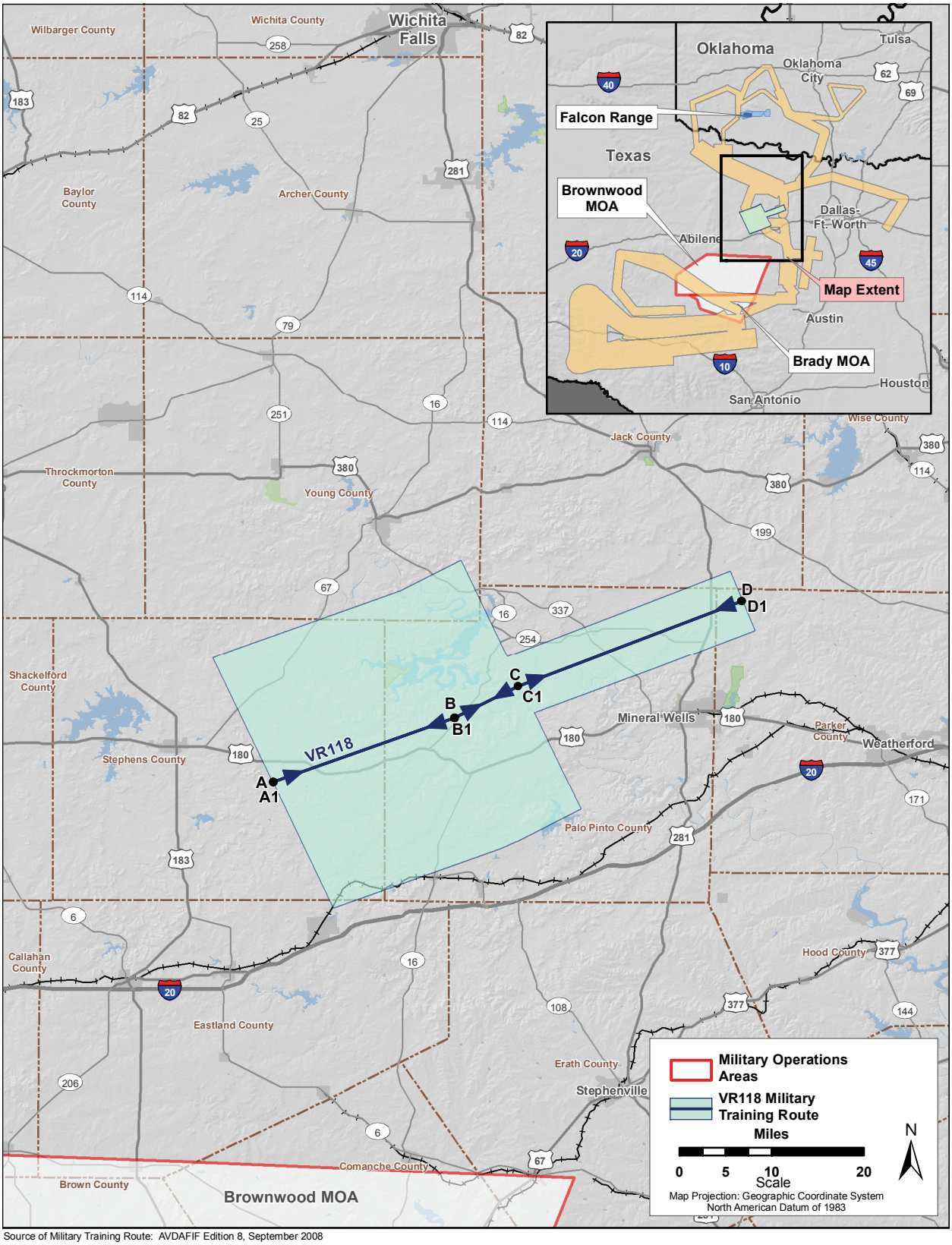
Table A-9. VR118

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 32°42.00' W 98°45.00'	5.0/13.0	500 AGL and 15,500 MSL
B	N 32°48.00' W 98°28.00'	3.0/13.0	500 AGL and 15,500 MSL
C	N 32°51.00' W 98°22.00'	3.0/3.0	500 AGL and 6,000 MSL
D	N 32°59.00' W 98°01.00'	3.0/3.0	500 AGL and 6,000 MSL
D1	N 32°59.00' W 98°01.00'	3.0/3.0	500 AGL and 6,000 MSL to (Start Maneuver Area)
C1	N 32°51.00' W 98°22.00'	3.0/13.0	500 AGL and 15,500 MSL
B1	N 32°48.00' W 98°28.00'	5.0/13.0	500 AGL and 15,500 MSL
A1	N 32°42.00' W 98°45.00'	Exit Point to Thence Via Published Route	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-9. VR118

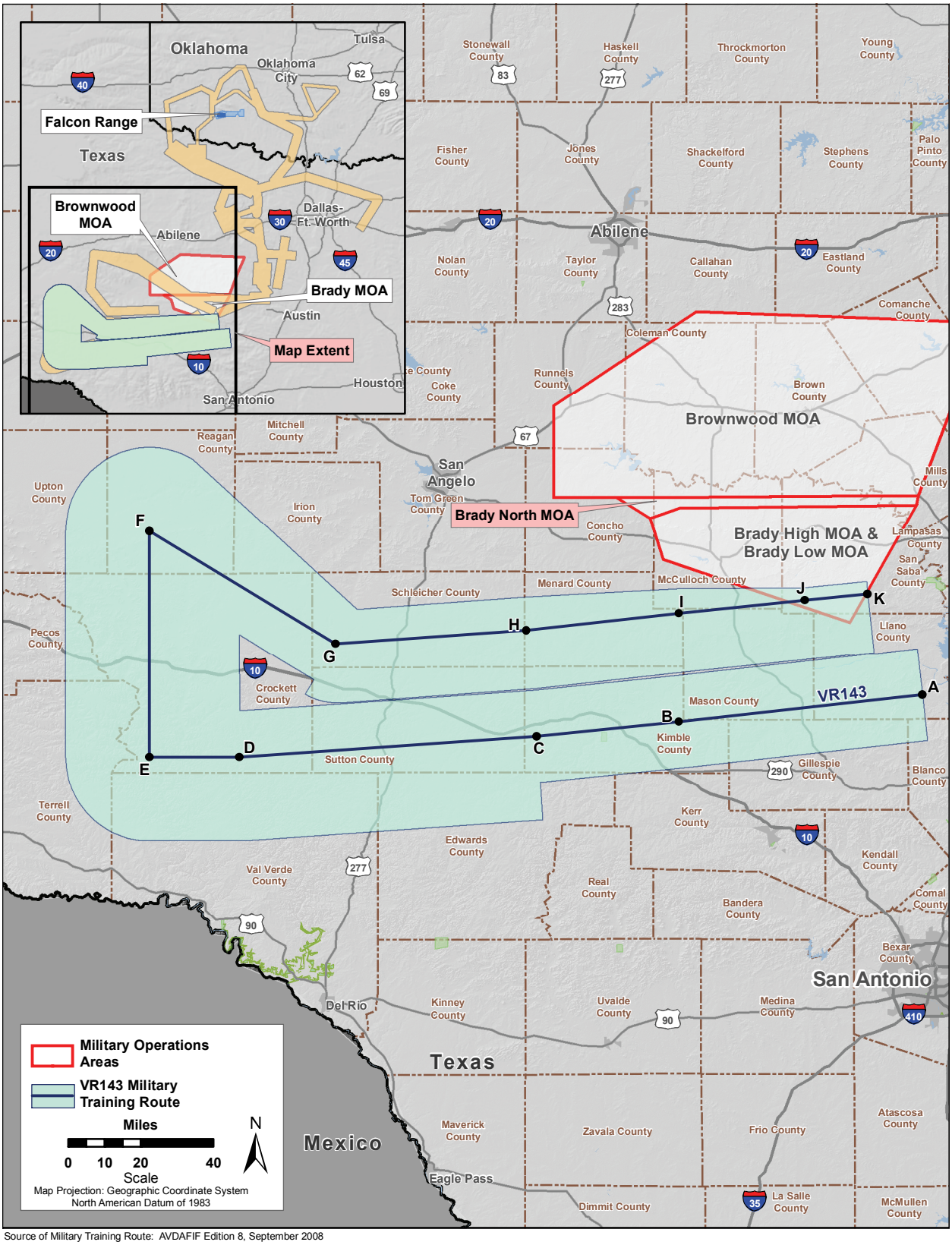
Table A-10. VR143

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 30°36.00’ W 98°32.00’	11.0/11.0	500 AGL and 5,000 MSL
B	N 30°29.50’ W 99°30.00’	11.0/11.0	500 AGL and 5,000 MSL
C	N 30°26.00’ W 100°04.00’	20.0/11.0	100 AGL and 5,000 MSL
D	N 30°21.00’ W 101°15.00’	20.0/20.0	100 AGL and 6,000 MSL
E	N 30°21.00’ W 101°36.50’	20.0/20.0	100 AGL and 5,000 MSL
F	N 31°15.00’ W 101°36.50’	20.0/10.0 Tapers from 20 NM to 8 NM (left)	500 AGL and 5,000 MSL
G	N 30°48.00’ W 100°52.00’	8.0/14.0	500 AGL and 6,000 MSL
H	N 30°51.30’ W 100°06.50’	8.0/14.0 Tapers from 8 NM to 6 NM (left)	500 AGL and 4,000 MSL
I	N 30°55.30’ W 99°30.00’	6.0/14.0 Tapers from 6 NM to 3 NM (left)	500 AGL and 6,000 MSL
J	N 30°58.50’ W 99°00.00’	3.0/14.0	500 AGL and 6,000 MSL
K	N 31°00.00’ W 98°45.00’	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-10. VR143

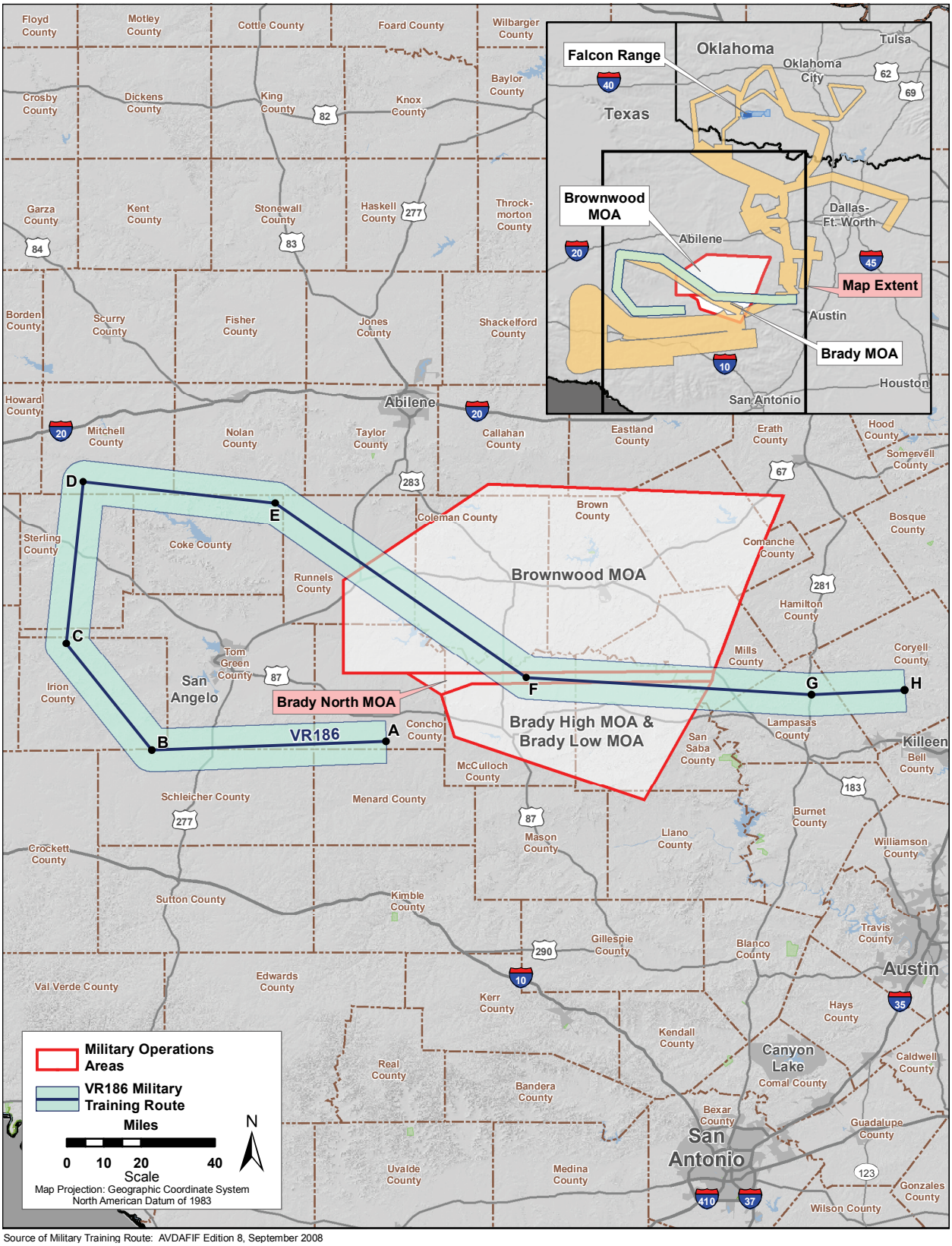
Table A-11. VR186

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 31°07.00' W 99°50.00'	5.0/5.0	500 AGL and 4,000 MSL
B	N 31°05.00' W 100°45.00'	5.0/5.0	100 AGL and 4,000 MSL
C	N 31°30.00' W 101°05.00'	5.0/5.0	100 AGL and 4,000 MSL
D	N 32°08.00' W 101°01.00'	5.0/5.0	100 AGL and 5,000 MSL
E	N 32°03.00' W 100°16.00'	5.0/5.0	500 AGL and 5,000 MSL
F	N 31°22.00' W 99°17.00'	5.0/5.0	500 AGL and 6,000 MSL
G	N 31°18.00' W 98°10.00'	5.0/5.0	1,000 AGL and 6,000 MSL
H	N 31°19.00' W 97°48.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-11. VR186

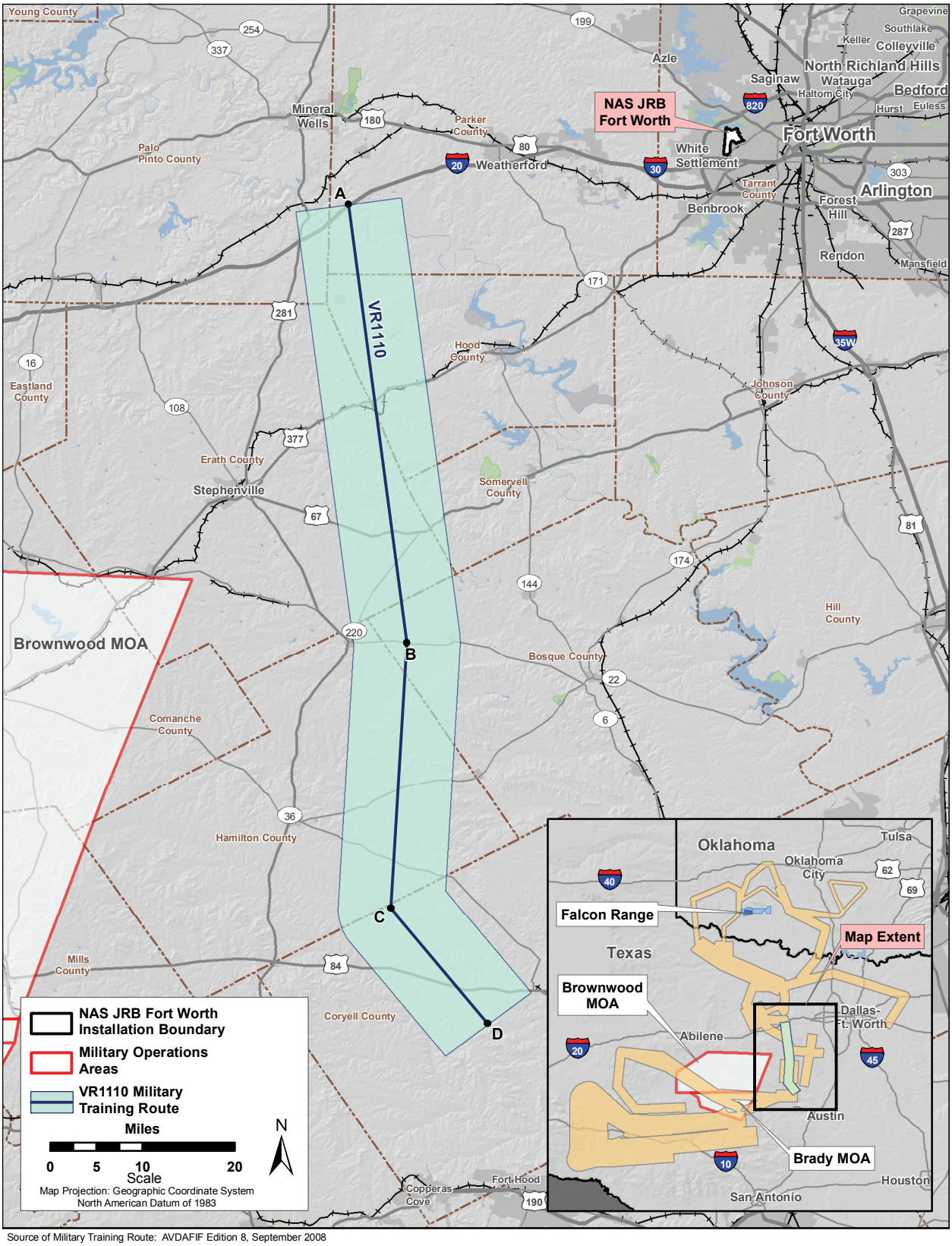
Table A-12. VR1110

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 32°40.00' W 98°02.00'	5.0/5.0	100 AGL and 1,500 MSL
B	N 31°58.80' W 97°56.50'	5.0/5.0	100 AGL and 1,500 MSL
C	N 31°33.80' W 97°58.00'	5.0/5.0	1,000 AGL and 1,500 MSL
D	N 31°23.00' W 97°48.90'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-12. VR1110

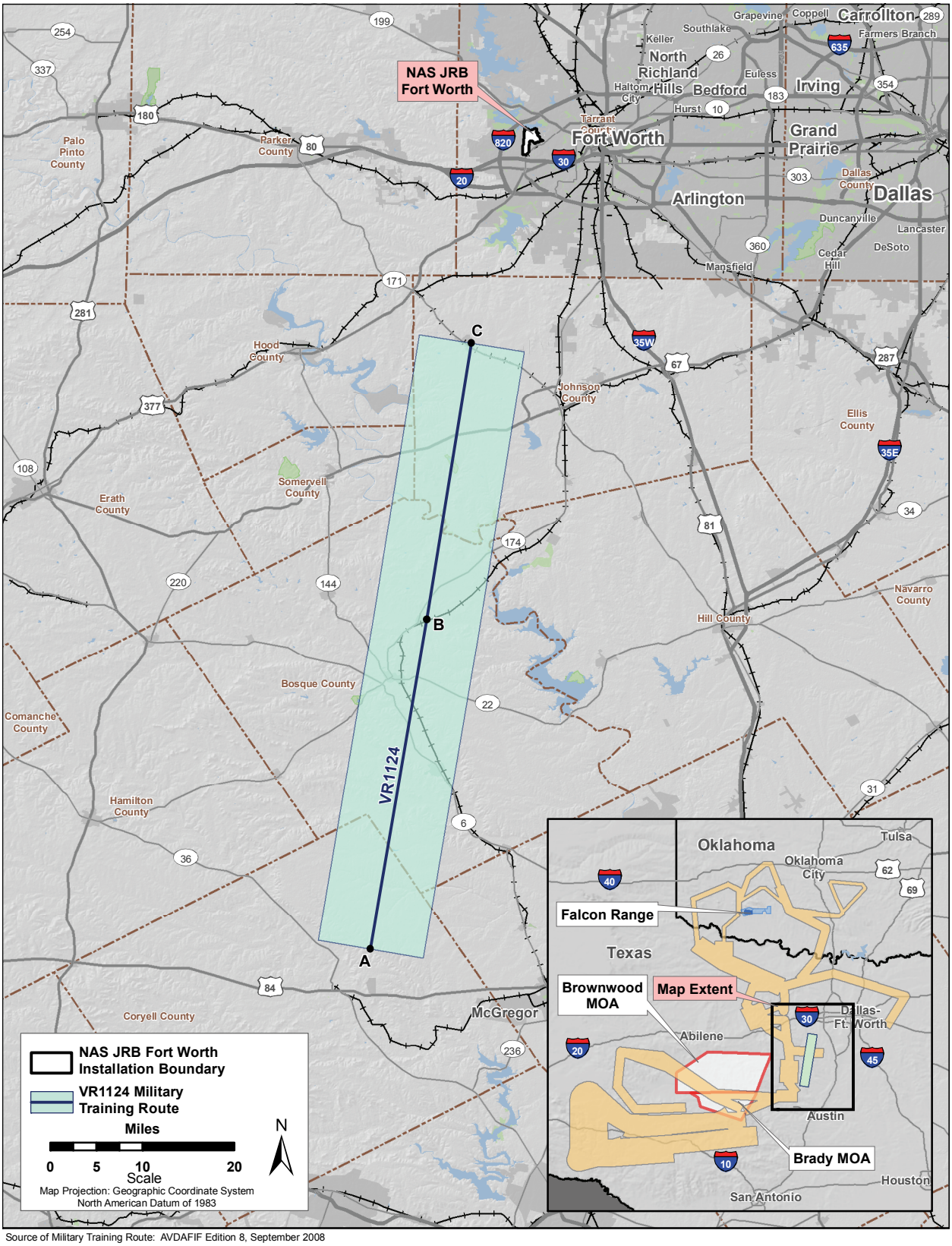
Table A-13. VR1124

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 31°30.00' W 97° 41.00'	5.0/5.0	500 AGL to 1,500 AGL
B	N 32°01.00' W 97°35.70'	5.0/5.0	500 AGL to 1,500 AGL
C	N 32°27.00' W 97°31.50'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-13. VR1124

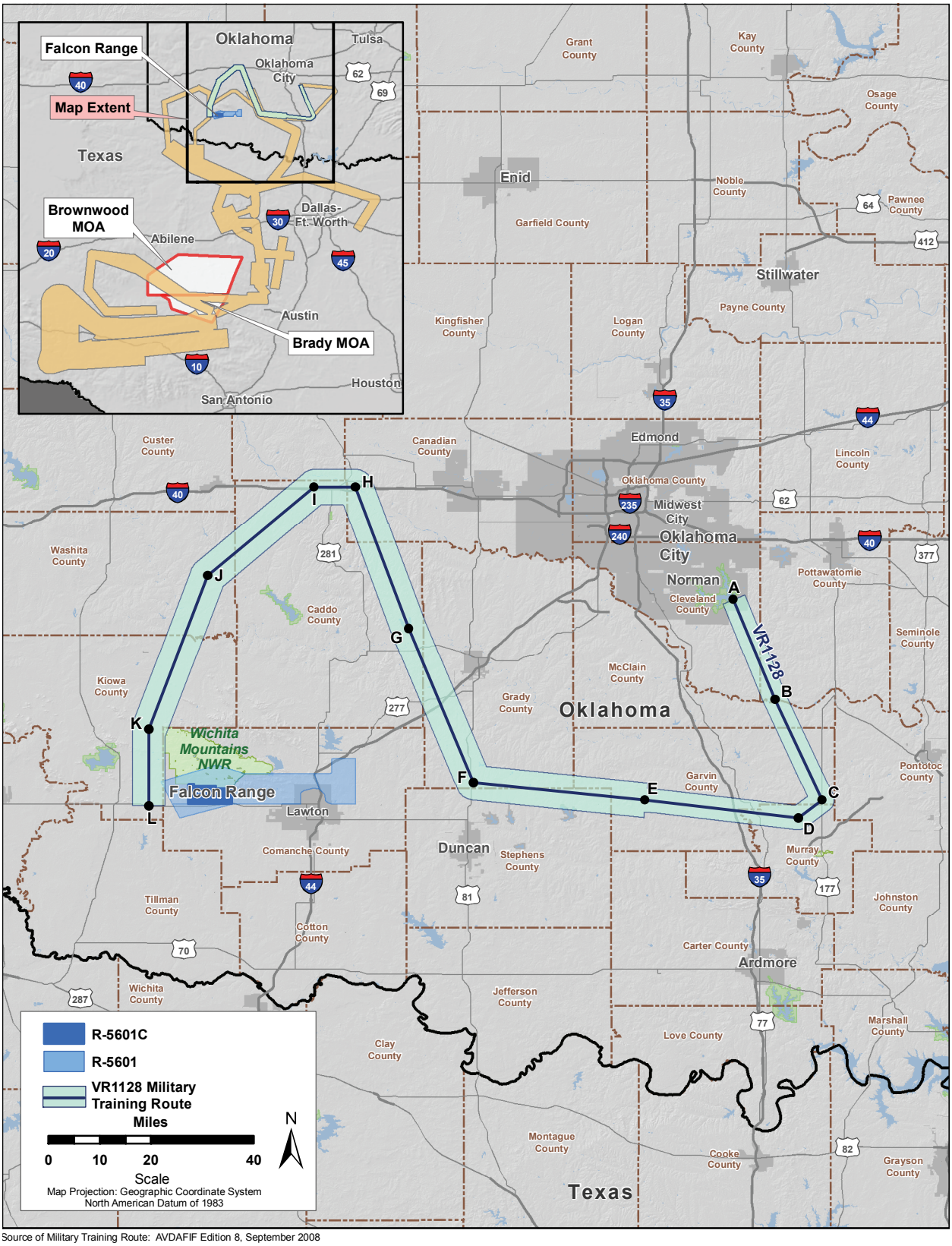
Table A-14. VR1128

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 35°13.00' W 97°13.00'	2.0/2.0	1,500 AGL
B	N 34°56.00' W 97°06.00'	2.0/2.0	500 AGL and 1,500 AGL
C	N 34°39.00' W 96°58.00'	2.0/2.0	500 AGL and 1,500 AGL
D	N 34°36.00' W 97°02.00'	2.0/2.0	500 AGL and 1,500 AGL
E	N 34°39.00' W 97°28.00'	3.0/3.0	500 AGL and 1,500 AGL
F	N 34°42.00' W 97°57.00'	3.0/3.0	500 AGL and 1,500 AGL
G	N 35°08.00' W 98°08.00'	3.0/3.0	500 AGL and 1,500 AGL
H	N 35°32.00' W 98°17.00'	3.0/3.0	500 AGL and 1,500 AGL
I	N 35°32.00' W 98°24.00'	3.0/3.0	500 AGL and 1,500 AGL
J	N 35°17.00' W 98°42.00'	3.0/3.0	500 AGL and 1,500 AGL
K	N 34°51.00' W 98°52.00'	3.0/3.0	1,000 AGL and 1,500 AGL
L	N 34°38.00' W 98°52.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-14. VR1128

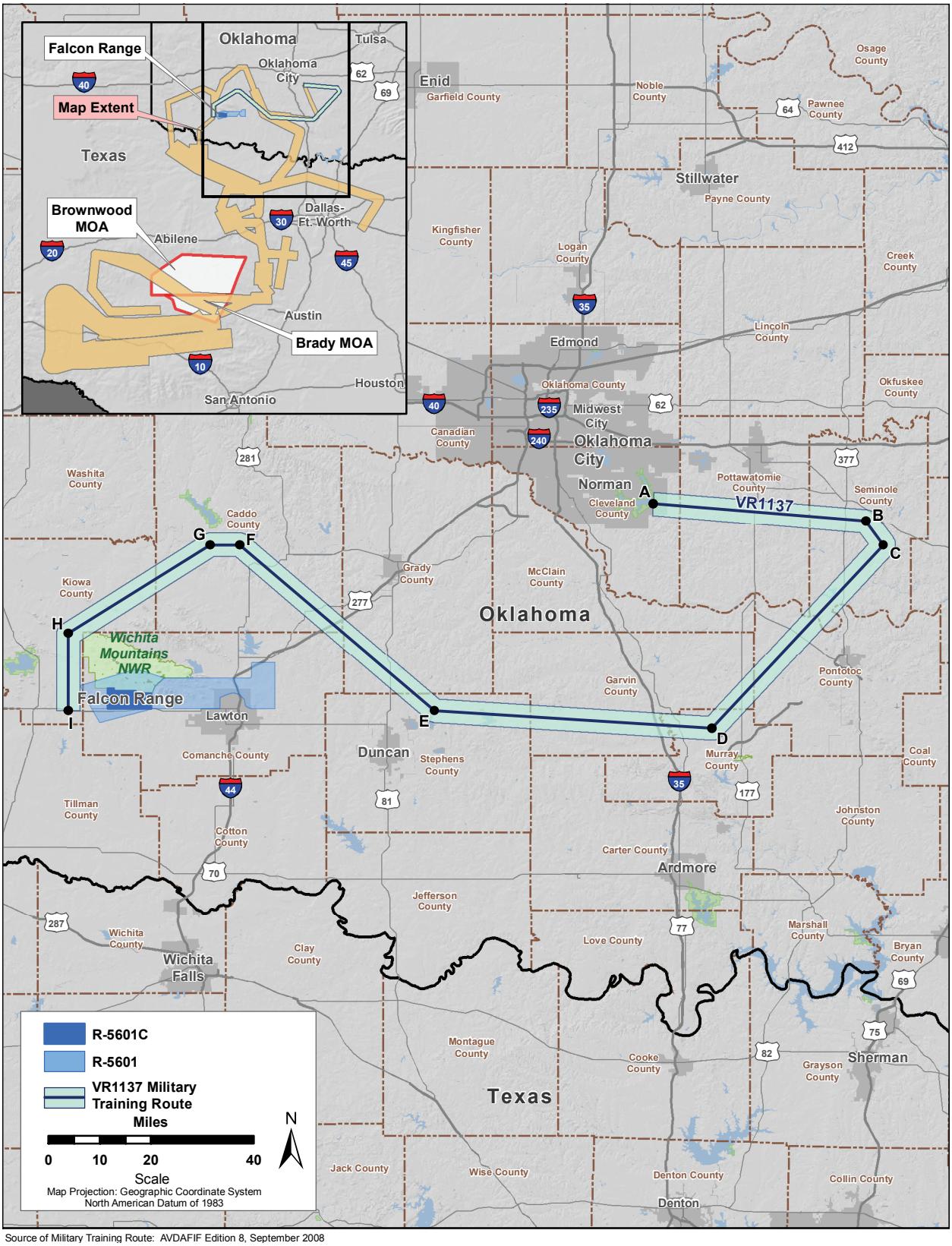
Table A-15. VR1137

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 35°13.00' W 97°13.00'	2.0/2.0	500 AGL and 1,500 AGL
B	N 35°10.00' W 96°37.00'	2.0/2.0	500 AGL and 1,500 AGL
C	N 35°06.00' W 96°34.00'	2.0/2.0	500 AGL and 1,500 AGL
D	N 34°35.00' W 97°03.00'	2.0/2.0	500 AGL and 1,500 AGL
E	N 34°38.00' W 97°50.00'	2.0/2.0	500 AGL and 1,500 AGL
F	N 35°06.00' W 98°23.00'	2.0/2.0	500 AGL and 1,500 AGL
G	N 35°06.00' W 98°28.00'	2.0/2.0	500 AGL and 1,500 AGL
H	N 34°51.00' W 98°52.00'	2.0/2.0	1,000 AGL and 1,500 AGL
I	N 34°38.00' W 98°52.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-15. VR1137

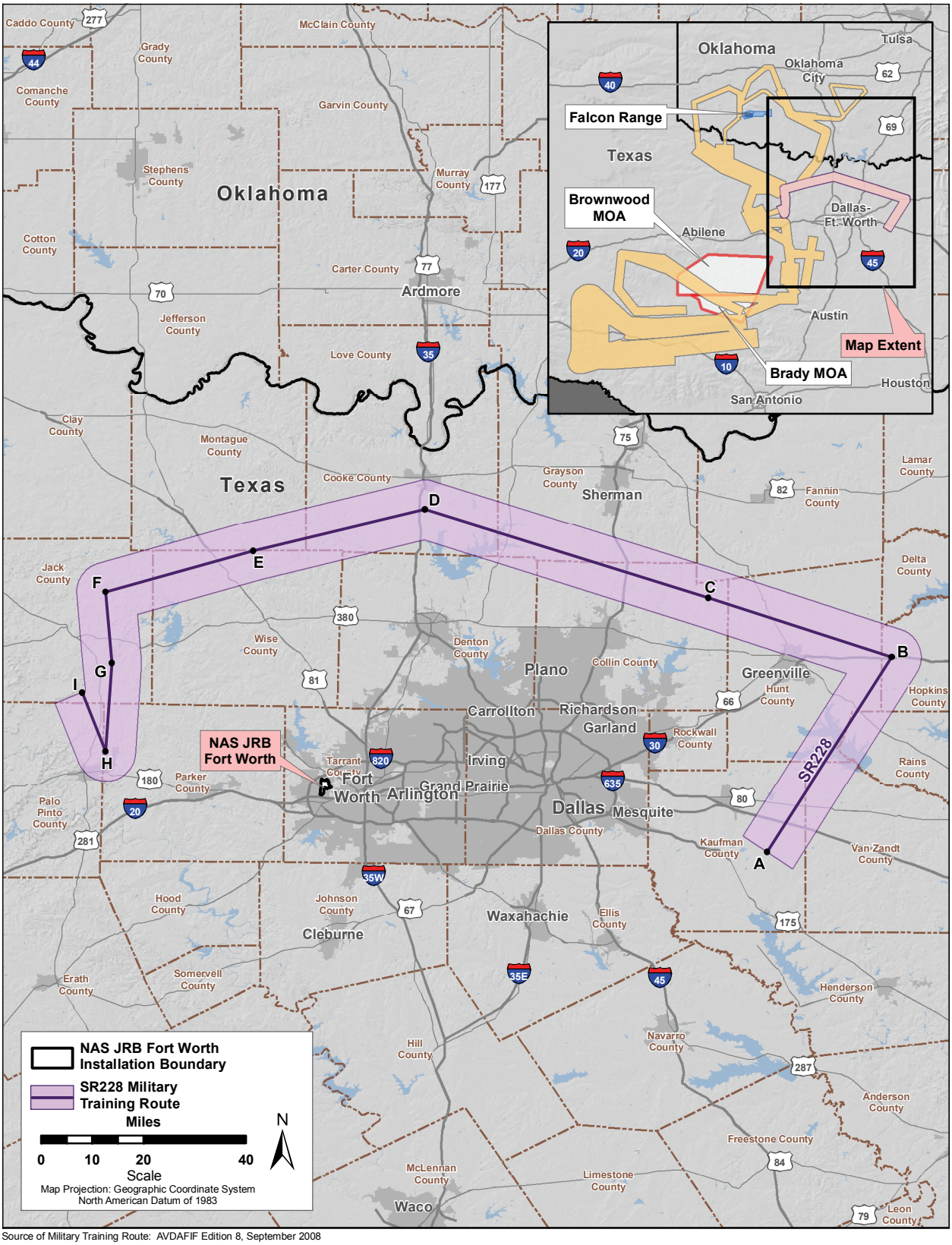
Table A-16. SR228

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 32°35.00' W 96°11.00'	5.0/5.0	500 AGL Minimum
B	N 33°08.00' W 95°50.00'	5.0/5.0	500 AGL Minimum
C	N 33°18.00' W 96°21.00'	5.0/5.0	500 AGL Minimum Alternate Entry Point
D	N 33°33.00' W 97°09.00'	5.0/5.0	300 AGL Minimum
E	N 33°26.00' W 97°38.00'	5.0/5.0	300 AGL Minimum
F	N 33°19.00' W 98°03.00'	5.0/5.0	300 AGL Minimum
G	N 33°07.00' W 98°02.00'	5.0/5.0	300 AGL Minimum
H	N 32°52.00' W 98°03.00'	5.0/5.0	500 AGL Minimum
I	N 33°02.00' W 98°07.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/ SUA, NAS JRB, Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB, Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM
4. 72 hours prior coordination required
5. Minimum altitudes: 500' AGL (A) to (C), (G) to (I). 300' AGL (C) to (G)
5. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-16. SR228

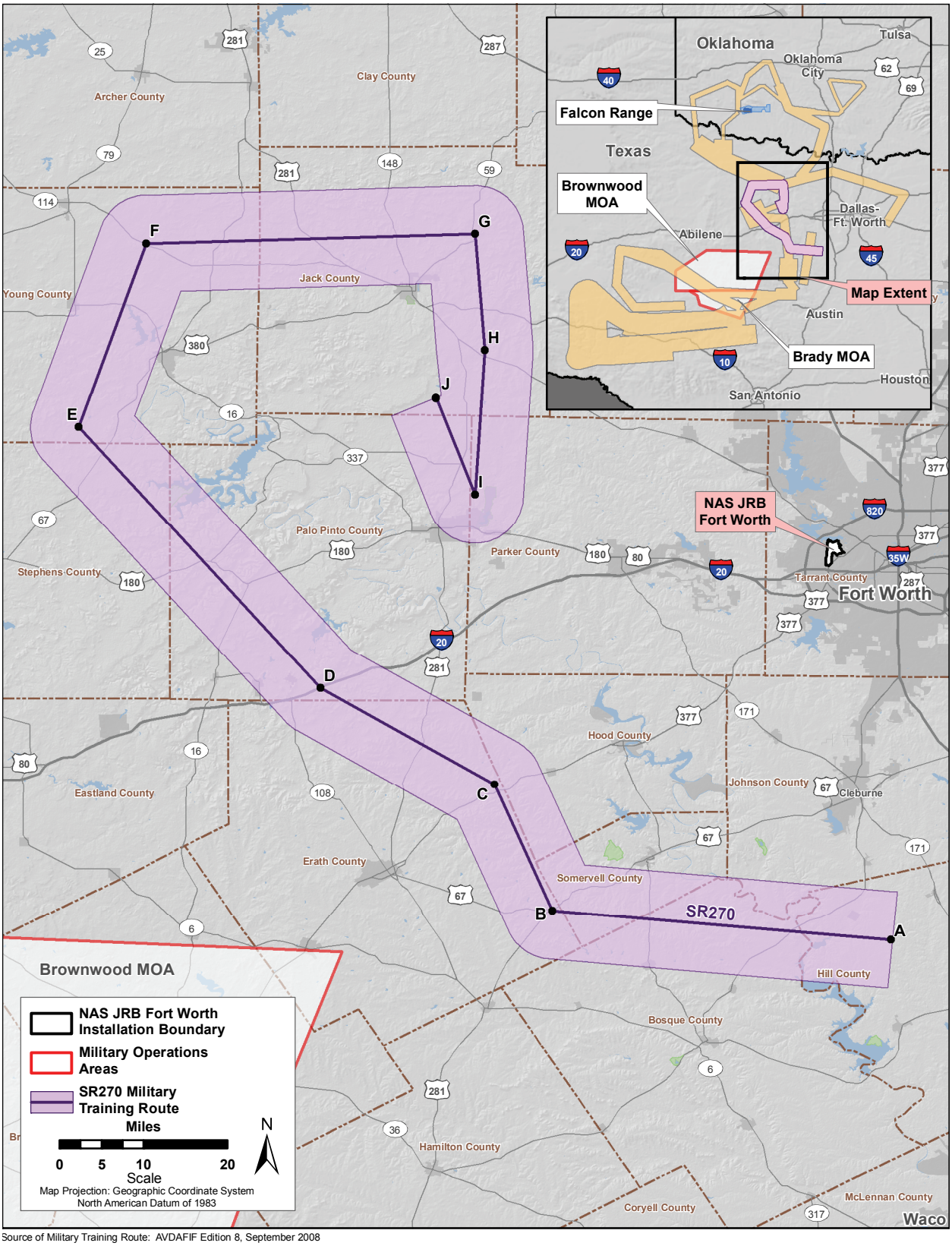
Table A-17. SR270

Turn Point	Latitude/Longitude	Width Left/Right (NM)	Altitude Structure (feet)
A	N 32°06.00' W 97°20.00'	5.0/5.0	500 AGL Minimum
B	N 32°09.00' W 97°55.00'	5.0/5.0	300 AGL Minimum
C	N 32°22.00' W 98°01.00'	5.0/5.0	300 AGL Minimum
D	N 32°32.00' W 98°19.00'	5.0/5.0	300 AGL Minimum Alternate Entry Point
E	N 32°59.00' W 98°44.00'	5.0/5.0	300 AGL Minimum Alternate Entry Point
F	N 33°18.00' W 98°37.00'	5.0/5.0	300 AGL Minimum
G	N 33°19.00' W 98°03.00'	5.0/5.0	300 AGL Minimum
H	N 33°07.00' W 98°02.00'	5.0/5.0	300 AGL Minimum
I	N 32°52.00' W 98°03.00'	5.0/5.0	500 AGL Minimum
J	N 33°02.00' W 98°07.00'	Exit Point	

Source: DOD 2008

Notes:

1. Originating Activity: 301 OG/ SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM
4. 72 hours prior coordination required
5. Minimum altitudes: 500' AGL (A) to (B), 300' AGL (B) to (I), 500' AGL (I) to (J)
6. For information on Special Operating Procedures, please refer to the 2008 DOD publication titled *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America* (DOD 2008).



Source of Military Training Route: AVDAFIF Edition 8, September 2008

Figure A-17. SR270

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Military Operations Areas

Table A-18. Brady North MOA

Corner	Latitude/Longitude	Lower Altitude (feet)	Upper Altitude (feet)
A	N 31°23' .97" W 99°44' 58.71"	3,600 MSL	18,000 MSL
B	N 31°23' 31.39" W 98°32' 47.77"		
C	N 31°21' 12.07" W 98°33' 29.29"		
D	N 31°20' 31.77" W 99°30' .24"		
E	N 31° 8' 1.41" W 99°37' 9.68"		

Source: AVDAFIF 2008
Notes (Source: 301 FW 2006):

1. Originating Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
2. Scheduling Activity: 301 OG/SUA, NAS JRB Fort Worth, Texas
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM.
4. Brady North MOA is used ONLY in conjunction with the Brownwood MOA and Brady South MOA simultaneously. Brownwood MOA is scheduled by NAS JRB Navy Base Operations.

Table A-19. Brady South Low MOA

Corner	Latitude/Longitude	Lower Altitude (feet)	Upper Altitude (feet)
A	N 31°18' 1.41" W 99°37' 9.68"	500 AGL	5,999 MSL
B	N 31°20' 31.77" W 99°30' .24"		
C	N 31°21' 12.07" W 98°33' 29.29"		
D	N 30°53' 23.66" W 98°49' 20.63"		
E	N 31°8' 10.49" W 99°33' 55.91"		

Source: AVDAFIF 2008
Notes (Source: 301 FW 2006):

1. Originating Activity: FAA, Houston ARTCC
2. Scheduling Activity: FAA, Houston ARTCC
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM

Table A-20. Brady South High MOA

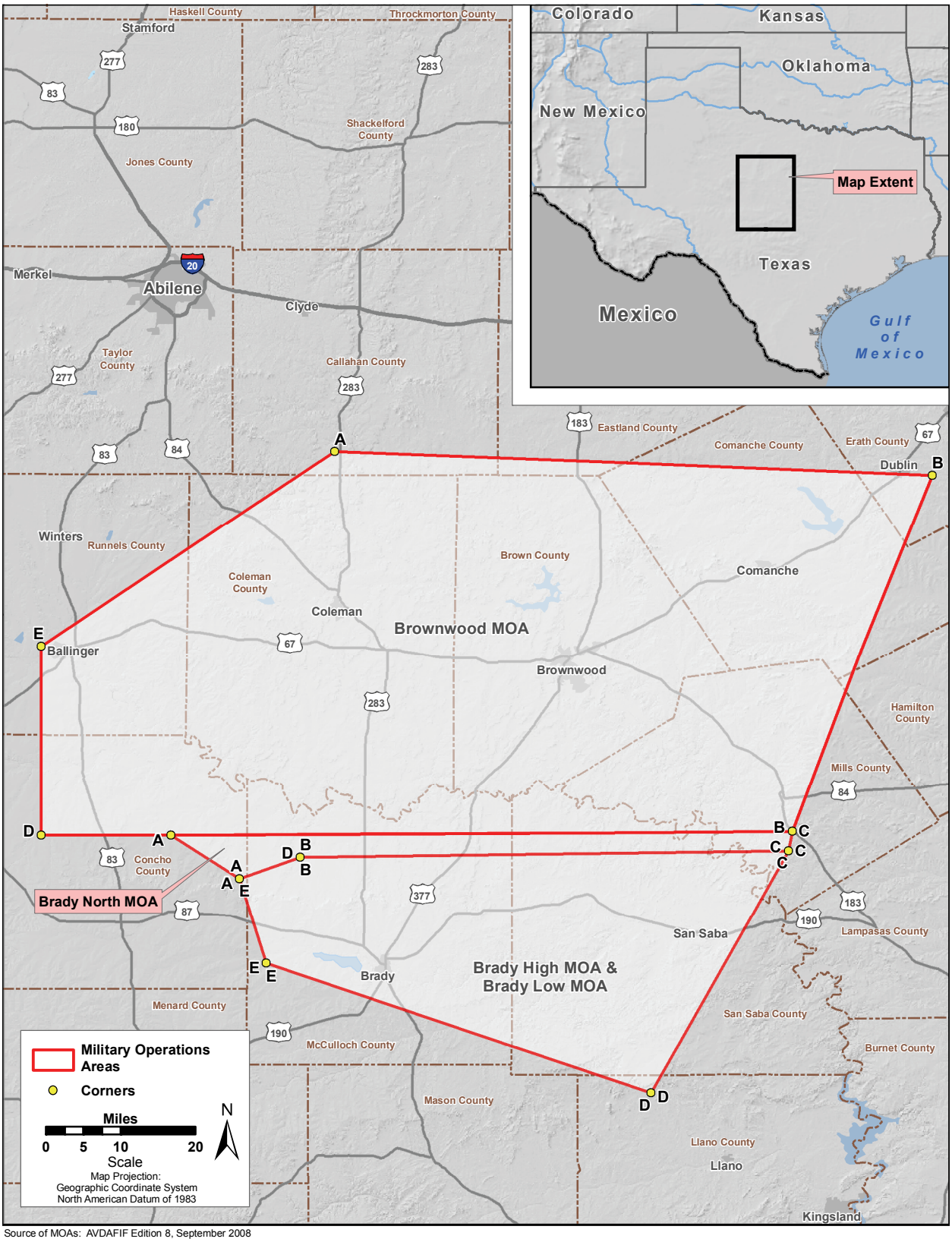
Corner	Latitude/Longitude	Lower Altitude (feet)	Upper Altitude (feet)
A	N 31°18’ 1.41” W 99°37' 9.68”	6,000 MSL	18,000 MSL
B	N 31°20’ 31.77” W 99°30’ .24”		
C	N 31°21’ 12.07” W 98°33’ 29.29”		
D	N 30°53’ 23.66” W 98°49’ 20.63”		
E	N 31°8’ 10.49” W 99°33’ 55.91”		

Source: AVDAFIF 2008
Notes (Source: 301 FW 2006):
1. Originating Activity: FAA, Houston ARTCC
2. Scheduling Activity: FAA, Houston ARTCC
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM

Table A-21. Brownwood MOA/ATCAA

Corner	Latitude/Longitude	Lower Altitude (feet)	Upper Altitude (feet)
A	N 32°7’ 27.79” W 99°25’ 59.06”	7,000–13,000 MSL*	18,000 MSL
B	N 32°4’ 46.84” W 98°16’ 48.51”		
C	N 31°23’ 31.39” W 98°32’ 47.77”		
D	N 31°23’ 5.18” W 99°59’ 51.43”		
E	N 31°44’ 55.6” W 99°59’ 59.51”		

Source: AVDAFIF 2008
Notes (Source: 301 FW 2006):
1. Scheduling Activity: U.S. Navy
2. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM
3. *The entire Brownwood MOA complex is composed of multiple MOAs. Brownwood 1 East, 1 West, 2 East, and 2 West have a lower altitude of 7,000 MSL. Brownwood 3 and 4 have a lower altitude of 13,000 MSL. All portions of the Brownwood MOA have an upper altitude of 18,000 MSL.



Source of MOAs: AVDAFIF Edition 8, September 2008

Figure A-18. Military Operations Areas (MOAs)

R-5601C (Overlying Falcon Range)

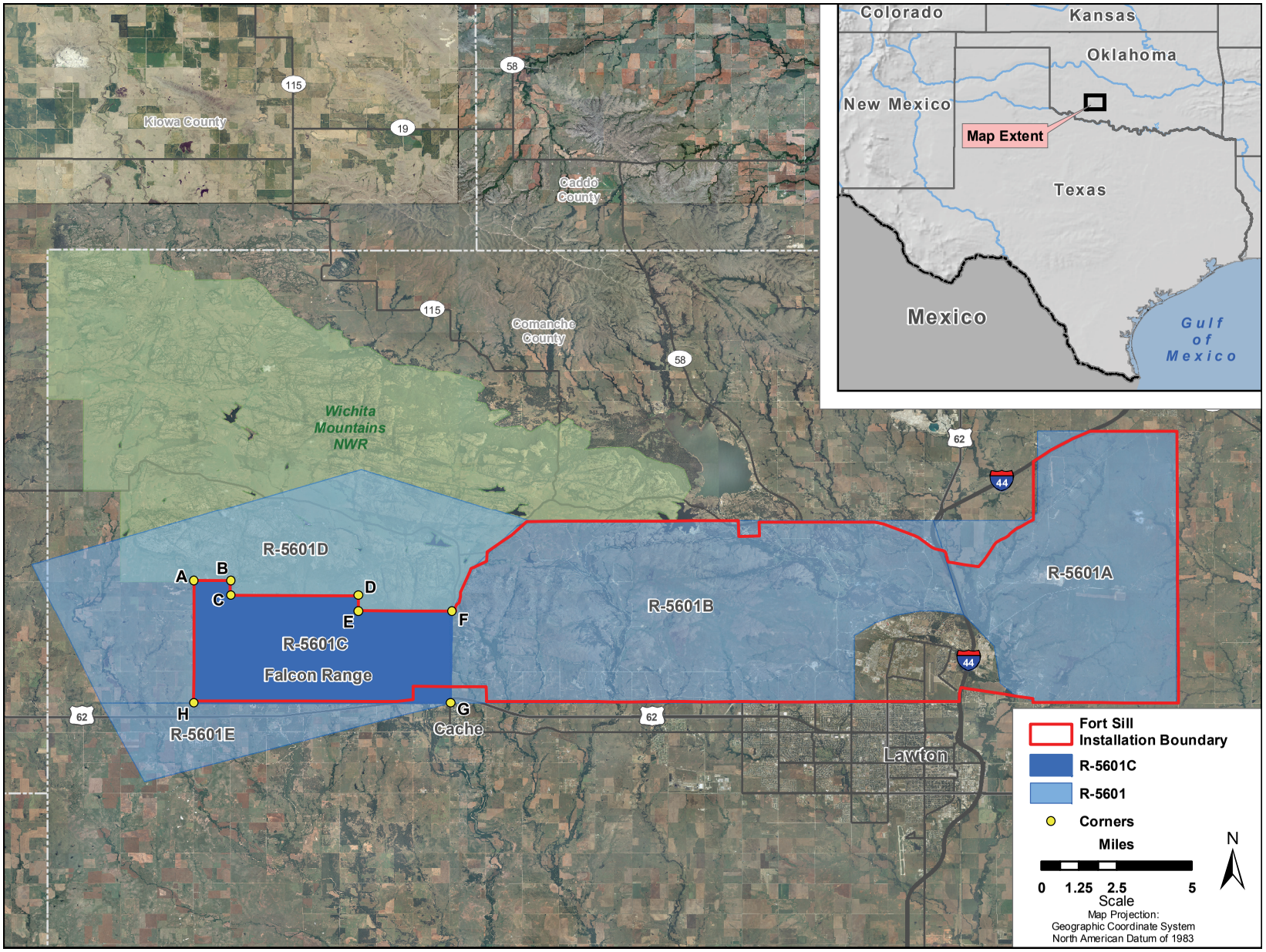
Table A-22. R-5601C

Corner	Latitude/Longitude	Lower Altitude (feet)	Upper Altitude (feet)
A	N 34°41’ 46.01” W 98°45’ 21.63”	Surface	40,000 MSL
B	N 34°41’ 46.5” W 98°44’ 17.26”		
C	N 34°41’ 20.75” W 98°44’ 17.03”		
D	N 34°41’ 20.92” W 98°40’ 36.01”		
E	N 34°40’ 53.98” W 98°40' 35.9”		
F	N 34°40’ 54.05” W 98°37’ 53.9”		
G	N 34°38’ 15.25” W 98°37’ 56.97”		
H	N 34°38’ 15.02” W 98°45’ 20.97”		

Source: AVDAFIF 2008 and Kessens 2008

Notes:

1. Originating Activity: FAA, Fort Worth
2. Scheduling Activity: ARTCC
3. Effective Times: 0700-2200 local (GMT +5), daily, and other times by NOTAM



Source of R5601: AVDAFIF Edition 8, September 2008. Source of Aerial Photography: NAIP 2006, 2005, and 2008

Figure A-19. Falcon Range

References

301 FW 2006 — 301st Fighter Wing (301 FW). 2006. *301st Fighter Wing NAS Fort Worth JRB, Texas Special Use Airspace Quick Reference Guide.* 15 August 2006.

AVDAFIF 2008 — Arc View Digital Aeronautical Flight Information File (AVDAFIF). 2008. Edition 8. National Geospatial-Intelligence Agency (NGA). September 2008.

DOD 2008 — Department of Defense (DOD). 2008. *DOD Flight Information Publication, Area Planning, Military Training Routes, North and South America.* 31 July 2008. Published by National Geospatial-Intelligence Agency, St. Louis, Missouri. Copyright 2003 by the United States Government. NSN 7641014109670. NIMA Ref. No. PLANXAP1BBOOK.

Kessens 2008 — Kessens, Mark. 2008. E-mail correspondence between Mr. Mark Kessens (QAE at Falcon Range) and Ms. Elaine Dubin (engineering-environmental Management [e²M]) regarding Falcon Range areas, coordinates, and hours of operation. 7 July 2008.

301 FW Airspace and Airfield Operations Data Collection Request (Excel Workbook)

Note: The operational data below is shown as it was provided by the 301st Fighter Wing OG/RO. For several airspace areas, altitude distributions and flight profile data were not provided for the C-172 and T-6 aircraft. When completing the noise and air quality analyses, assumptions were made based on altitude distributions that were provided for similar aircraft and default flight profile data from the noise modeling program. In addition, substitute aircraft were chosen for the noise and air quality analyses because several of the aircraft shown below were not available. The substitutions were made based on similar engine types and aircraft sizes.

Aircraft Type	Falcon Range (R-5601 C/D/E)																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
AT-38	1200	0	1200	1200	0	1200	1200	0	1200	0.9	420	0.5	10%	10%	40%	35%	5%	0%	0%	100%
F-16	475	48	523	760	65	825	1060	75	1135	0.9	420	0.6	5%	5%	10%	15%	50%	10%	5%	100%
F/A-18	200	45	245	168	42	210	170	45	215	0.9	400	0.6	10%	10%	10%	30%	30%	10%	0%	100%
Alpha	55	0	55	108	0	108	108	0	108	0.9	375	2.0	30%	20%	20%	20%	10%	0%	50%	150%
B-1	5	1	6	3	3	6	3	3	6	0.85	400	1.0	2%	3%	0%	0%	0%	45%	5%	55%
F22	5	1	6	5	1	6	5	1	6	90	420	0.6	5%	5%	10%	15%	50%	10%	100%	195%
B-2	6	0	6	6	6	12	0	6	6	0.9	350	1.0	0%	0%	0%	0%	0%	0%	50%	50%
B-52	22	0	22	25	0	25	25	10	35	0.9	350	1.5	0%	0%	0%	0%	0%	50%	0%	50%
UH-60	24	36	60	60	15	75	60	15	75	1	150	0.8	75%	25%	0%	0%	0%	0%	0%	100%
CH-146	0	0	0	80	10	90	80	10	90	1	110	2.0	75%	25%	0%	0%	0%	0%	0%	100%
CH-47	4	10	14	4	12	16	4	12	16	1	150	0.3	75%	25%	0%	0%	0%	0%	0%	100%
A-10	6	0	6	60	20	80	110	30	140	0.9	275	0.7	10%	10%	10%	35%	30%	5%	0%	100%
F-5	0	0	0	0	0	0	500	0	500	0.9	420	0.5	10%	10%	40%	35%	5%	0%	0%	100%

Aircraft Type	Brady High																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	1472		1472	1764		1764	1062	118	1180	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-18	18		18	202		202	648	72	720	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-1	2		2	2		2	360	40	400	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-2	1		1	3		3	10	2	12	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-52	3		3	1		1	33	3	36	0	350	1.25	0%	0%	0%	25%	50%	25%	0%	100%
T-43	2		2	4		4	22	2	24	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
AT-38	6		6	133		133	65	7	72	0	300	1	0%	0%	0%	25%	50%	25%	0%	100%
T-1	1233		1233	1310		1310	2300	0	2300	0	240	1	0%	0%	0%	25%	50%	25%	0%	100%
A-10	4		4	1		1	33	3	36	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
C-130	2		2	6		6	33	3	36	0	210	1.5	0%	0%	0%	25%	50%	25%	0%	100%
C-17	3		3	5		5	22	2	24	0	250	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-15C	7		7	12		12	87	9	96	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-15E	7		7	12		12	87	9	96	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
KC-135	4		4	1		1	22	2	24	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
KC-10	4		4	3		3	22	2	24	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-22	6		6	10		10	16	2	18	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
MH-47	6		6	7		7	8	4	12	0	150	0.3	75%	25%	0%	0%	0%	0%	0%	100%
F-35/JSF	8		8	9		9	16	2	18	0	500	1	0%	0%	0%	10%	25%	65%	0%	100%

Aircraft Type	Brady Low																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	1447		1447	1764		1764	486	54	540	0	450	1.25	5%	20%	70%	5%	0%	0%	0%	100%
F-18	18		18	202		202	324	36	360	0	450	1.25	5%	20%	70%	5%	0%	0%	0%	100%
B-1	2		2	2		2	360	20	380	0	500	1.25	5%	20%	70%	5%	0%	0%	0%	100%
B-2	1		1	3		3	10	2	12	0	500	1.25	5%	20%	70%	5%	0%	0%	0%	100%
B-52	3		3	1		1	33	2	35	0	350	1.25	5%	20%	70%	5%	0%	0%	0%	100%
T-43	2		2	4		4	22	2	24	0	300	1.25	5%	20%	70%	5%	0%	0%	0%	100%
AT-38	6		6	133		133	32	4	36	0	300	1	5%	20%	70%	5%	0%	0%	0%	100%
T-1	1		1	10		10	22	2	24	0	240	1	5%	20%	70%	5%	0%	0%	0%	100%
A-10	10		10	7		7	16	2	18	0	300	1.25	5%	20%	70%	5%	0%	0%	0%	100%
C-130	2		2	6		6	33	2	35	0	210	1.5	5%	20%	70%	5%	0%	0%	0%	100%
C-17	3		3	5		5	22	2	24	0	250	1.5	5%	20%	70%	5%	0%	0%	0%	100%
F-15C	7		7	12		12	43	5	48	0	450	1.25	5%	20%	70%	5%	0%	0%	0%	100%
F-15E	7		7	12		12	43	5	48	0	450	1.25	5%	20%	70%	5%	0%	0%	0%	100%
KC-135	4		4	1		1	10	2	12	0	350	1.5	5%	20%	70%	5%	0%	0%	0%	100%
KC-10	4		4	3		3	10	2	12	0	350	1.5	5%	20%	70%	5%	0%	0%	0%	100%
F-22	6		6	10		10	16	2	18	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-35/JSF	8		8	9		9	16	2	18	0	500	1	0%	0%	0%	10%	25%	65%	0%	100%
MH-47	6	0	6	7		7	8	0	8	1	150	0.3	15%	25%	60%	0%	0%	0%	0%	100%
C-172	1	0	1	1	0	1	1	0	1	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	Brady North																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	564		564	462		462	1062	118	1180	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-18	18		18	190		190	648	72	720	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-1	2		2	2		2	360	40	400	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-2	1		1	3		3	10	2	12	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-52	3		3	1		1	33	3	36	0	350	1.25	0%	0%	0%	25%	50%	25%	0%	100%
T-43	2		2	4		4	22	2	24	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
AT-38	6		6	133		133	65	7	72	0	300	1	0%	0%	0%	25%	50%	25%	0%	100%
T-1	1		1	10		10	43	5	48	0	240	1	0%	0%	0%	25%	50%	25%	0%	100%
A-10	10		10	7		7	33	3	36	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
C-130	2		2	6		6	33	3	36	0	210	1.5	0%	0%	0%	25%	50%	25%	0%	100%
C-17	3		3	5		5	22	2	24	0	250	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-15C	7		7	12		12	87	9	96	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-15E	7		7	12		12	22	2	24	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
KC-135	4		4	1		1	22	2	24	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
KC-10	4		4	3		3	22	2	24	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-22	6		6	10		10	16	2	18	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-35/JSF	8		8	9		9	16	2	18	0	500	1	0%	0%	0%	25%	50%	25%	0%	100%

Aircraft Type	Brownwood																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	575		575	498		498	1121		1121	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-18	23		23	221		221	857		857	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-1	4		4	4		4	400		400	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-2	2		2	4		4	15		15	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-52	3		3	2		2	38		38	0	350	1.25	0%	0%	0%	25%	50%	25%	0%	100%
T-43	2		2	4		4	21		21	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
AT-38	7		7	131		131	72		72	0	300	1	0%	0%	0%	25%	50%	25%	0%	100%
T-1	4		4	15		15	52		52	0	240	1	0%	0%	0%	25%	50%	25%	0%	100%
A-10	11		11	8		8	36		36	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
C-130	2		2	7		7	38		38	0	210	1.5	0%	0%	0%	25%	50%	25%	0%	100%
C-17	3		3	5		5	22		22	0	250	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-15C	7		7	13		13	91		91	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-15E	8		8	13		13	91		91	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
KC-135	4		4	1		1	22		22	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
KC-10	4		4	3		3	22		22	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-22	6		6	10		10	16		16	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-35/JSF	8		8	9		9	16		16	0	500	1	0%	0%	0%	25%	50%	25%	0%	100%

Aircraft Type	VR-101																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	0		0	10		10	25		25	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-18	0		0	0		0	5		5	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-1	0		0	0		0	0		0	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-2	0		0	0		0	0		0	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-52	0		0	0		0	0		0	0	350	1.25	0%	0%	0%	25%	50%	25%	0%	100%
T-43	0		0	0		0	0		0	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
AT-38	0		0	0		0	0		0	0	300	1	0%	0%	0%	25%	50%	25%	0%	100%
T-1	0		0	0		0	0		0	0	240	1	0%	0%	0%	25%	50%	25%	0%	100%
A-10	0		0	9		9	11		11	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
C-130	0		0	0		0	0		0	0	210	1.5	0%	0%	0%	25%	50%	25%	0%	100%
C-17	0		0	0		0	0		0	0	250	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-15C	0		0	0		0	0		0	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-15E	0		0	0		0	0		0	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
KC-135	0		0	0		0	0		0	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
KC-10	0		0	0		0	0		0	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-22	0		0	0		0	10		10	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-35/JSF	0		0	0		0	25		25	0	500	1	0%	0%	0%	25%	50%	25%	0%	100%
C-172	1		1	1		1	1		1	0	100	2								

Aircraft Type	VR-104																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	8		8	12		12	25		25	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-18	0		0	1		1	3		3	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-1	0		0	0		0	0		0	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-2	0		0	0		0	0		0	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
B-52	0		0	0		0	0		0	0	350	1.25	0%	0%	0%	25%	50%	25%	0%	100%
T-43	0		0	0		0	0		0	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
AT-38	8		8	10		10	16		16	0	300	1	0%	0%	0%	25%	50%	25%	0%	100%
T-1	2		2	6		6	9		9	0	240	1	0%	0%	0%	25%	50%	25%	0%	100%
A-10	3		3	8		8	11		11	0	300	1.25	0%	0%	0%	25%	50%	25%	0%	100%
C-130	3		3	10		10	12		12	0	210	1.5	0%	0%	0%	25%	50%	25%	0%	100%
C-17	0		0	0		0	0		0	0	250	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-15C	0		0	0		0	0		0	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-15E	0		0	0		0	0		0	0	450	1.25	0%	0%	0%	25%	50%	25%	0%	100%
KC-135	0		0	0		0	0		0	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
KC-10	0		0	0		0	0		0	0	350	1.5	0%	0%	0%	25%	50%	25%	0%	100%
F-22	0		0	0		0	15		15	0	500	1.25	0%	0%	0%	25%	50%	25%	0%	100%
F-35/JSF	0		0	0		0	16		16	0	500	1	0%	0%	0%	25%	50%	25%	0%	100%
C-172	1	0	1	1	0	1	1	0	1	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	VR-118																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	978		978	989		989	1111	0	1111	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	3		3	10		10	22	2	24	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	2	0	2	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	2	0	2	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	2	0	2	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	2	0	2	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	3		3	8		8	11	0	11	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	0		0	0		0	2	0	2	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	2		2	2	0	2	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	5		5	10		10	12	0	12	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	2	0	2	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	2	0	2	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	2	0	2	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	16	2	18	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
UAV	5		5	6		6	22	0	22	0	50	2	50%	25%	25%	0%	0%	0%	0%	100%
C-172	1	0	1	1	0	1	1	0	1	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	VR-143																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	13		13	15		15	17		17	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	3		3	7		7	9		9	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	315		315	341		341	374		374	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	21		21	32		32	35		35	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	6		6	8		8	9		9	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	2		2	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	10		10	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	6	0	6	5	0	5	6	0	6	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
T-6	7		7	20		20	120		120											

Aircraft Type	VR-186																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	53		53	23		23	31		31	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	1		1	3		3	3		3	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	2350	0	2350	2589	0	2589	2610	0	2610	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	4		4	5		5	6		6	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	10		10	20		20	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	7	0	7	5	0	5	6	0	6	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
T-6	0		0	2	0	2	4		4											

Aircraft Type	VR-1110																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	9		9	29		29	34		34	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	3		3	3		3	5		5	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	0		0	0		0	0		0	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	23		23	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	6	0	6	3	0	3	5	0	5	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
																				0%
																				0%
																				0%
																				0%
																				0%
																				0%
																				0%
																				0%

Aircraft Type	VR-1124																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	0		0	7		7	8		8	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	2		2	5		5	7		7	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F15-C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F15-E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	8	4	12	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	2	0	2	1	0	1	2	0	2	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	VR-1128																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	2		2	3		3	3		3	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	2		2	3		3	3		3	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	4		4	8		8	15		15	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	2		2	3		3	5		5	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	2		2	7		7	8		8	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	10		10	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	1	0	1	1	0	1	2	0	2	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	VR-1137																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	2		2	3		3	3		3	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	2		2	3		3	3		3	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	4		4	8		8	15		15	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	2		2	3		3	5		5	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	2		2	7		7	8		8	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	10		10	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	1	0	1	1	0	1	2	0	2	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	IR-103																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	483		483	265		265	370		370	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	4		4	78		78	8		8	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	65		65	69		69	70		70	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	0		0	0		0	0		0	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	10		10	21		21	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	273		273	7		7	87		87	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	200		200	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	2	0	2	2	0	2	3	0	3	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
Alpha Jet	0		0	7		7	5		5	0.9	375	2.0	30%	20%	20%	30%	0%	0%	0%	100%

Aircraft Type	IR-105																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	0		0	2		2	8		8	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	4		4	8		8	10		10	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	33		33	65		65	79		79	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	0		0	0		0	0		0	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	1		1	15		15	21		21	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	7		7	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	1	0	1	3	0	3	3	0	3	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
Alpha Jet	7		7	10		10	12		12	0.9	375	2.0	30%	20%	30%	20%	0%	0%	0%	100%

Aircraft Type	IR-123																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	13		13	*15*		15	17		17	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	3		3	*7*		7	9		9	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	*0*		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	*0*		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	*0*		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	*0*		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	315		315	*341*		341	374		374	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	21		21	32		32	35		35	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	6		6	8		8	9		9	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	2		2	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	0		0	10		10	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	6		6	5		5	6		6	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
T-6	7		7	*20*		20	120		120											

Aircraft Type	IR-124																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	53		53	23		23	31		31	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	1		1	3		3	3		3	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	2350		2350	2589		2589	2610		2610	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	4		4	5		5	6		6	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	0		0	0		0	0		0	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	10		10	20		20	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	7	0	7	5		5	6		6	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%
T-6	0		0	2		2	4		4											

Aircraft Type	IR-139																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
F-16	4		4	10		10	11		11	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-18	2		2	3		3	5		5	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-1	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-2	0		0	0		0	0		0	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
B-52	0		0	0		0	0		0	0	350	0.6	10%	10%	20%	30%	30%	0%	0%	100%
T-43	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
AT-38	1		1	5		5	9		9	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
T-1	0		0	0		0	0		0	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	4		4	7		7	9		9	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	5		5	8		8	11		11	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
F-15C	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-15E	0		0	0		0	0		0	0	450	0.5	10%	10%	20%	30%	30%	0%	0%	100%
F-22	0		0	4		4	7		7	0	500	0.5	10%	10%	20%	30%	30%	0%	0%	100%
C-172	2		2	2		2	2		2	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	SR-228																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
T1	5		5	6		6	10		10	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	35		35	45		45	45		45	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
C-172	2		2	2		2	2		2	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

Aircraft Type	SR-270																			
	Baseline Annual Sorties (Pre-BRAC)			Proposed Annual Sorties (Post-BRAC)			Forecasted Annual Sorties (Hypothetical)			Flight Profile			Altitude Distribution (in Percent)							
	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	5000-10000 ft AGL	10000 ft AGL-FL179	FL180-FL239	FL240-FL500	Total
C-130 Example	960	7	967	960	7	967	960	7	967	65	165	0.5	5%	5%	10%	65%	15%	0%	0%	100%
T-1	5		5	6		6	8		8	0	240	1	10%	10%	20%	30%	30%	0%	0%	100%
A-10	0		0	0		0	0		0	0	300	0.75	10%	10%	20%	30%	30%	0%	0%	100%
C-130	35		35	45		45	45		45	0	210	1	10%	10%	20%	30%	30%	0%	0%	100%
C-17	0		0	0		0	0		0	0	250	1	10%	10%	20%	30%	30%	0%	0%	100%
C-172	2		2	2		2	2		2	0	100	6	80%	20%	0%	0%	0%	0%	0%	100%

APPENDIX B

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix B

Applicable Laws, Regulations, Policies, and Planning Criteria

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws as well as Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

Airspace

Airspace management in the United States Air Force (USAF) is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace (SUA). It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace and establishes practices to decrease disturbances from flight operations that might cause adverse public reaction and provides flying unit commanders with general guidance for dealing with local problems.

Noise

The Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

Land Use

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use.

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQSs) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment to pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCR). Pollutant concentration levels are measured at

designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassifiable. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS, contribute to an increase in the frequency or severity of violations of NAAQS, or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de mimimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Safety

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program,* implements AFPD 91-3, *Occupational Safety and Health,* by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Geological Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland are soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, deep or thick effective rooting zones, and are not subject to periodic flooding. Under the Farmland Protection Policy Act, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the Farmland Protection Policy Act include Federal permitting and licensing, projects on land already

in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water-quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone, through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone, must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

Biological Resources

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintains the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate State Fish and Wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport or carry from one state, territory, or district to another, or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects 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.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

Cultural Resources

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency

official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 establishes rights of American Indian tribes to claim ownership of certain "cultural items," defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners' access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list "programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes, redesigning products, substituting raw materials, and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]) sets a goal for all Federal agencies that promotes environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of, increase diversion of solid waste as appropriate, and maintain cost effective waste prevention and recycling programs in their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to "incorporate pollution prevention principles, techniques, and mechanisms into their planning and decision making processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA."

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for "cradle-to-grave" management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with "hazardous substances" or "extremely hazardous substances" to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as "owners." However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the "innocent purchaser" defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment.

TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for "Asbestos Hazard Emergency Response," which applies only to schools. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, "Lead Exposure Reduction," directs Federal agencies to "conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards." Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

APPENDIX C

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING MATERIALS

Appendix C

Interagency and Intergovernmental Coordination for Environmental Planning Materials

DEPARTMENT OF THE AIR FORCE

AIR FORCE RESERVE COMMAND

MEMORANDUM FOR DISTRIBUTION 4 Sep 08

FROM: Mr. Randy H. Varner
301 FW Environmental Director
1215 Military Parkway
NAS JRB Fort Worth, TX 76127

SUBJECT: Solicitation of input into the preparation of an Environmental Assessment of 301st Fighter Wing (301 FW) Managed Airspace, Naval Air Station Joint Reserve Base (NAS JRB), Fort Worth, Texas.

1. The Air Force Reserve Command (AFRC) is preparing an Environmental Assessment (EA) to continue readiness training operations in airspace components owned and managed by the 301 FW to ensure users can continue to accomplish required mission readiness training requirements. This training involves the continued use of sixteen Military Training Routes (MTRs), Military Operations Areas (MOAs), and Falcon Bombing Range.

2. The environmental impact analysis process for the Proposed Action and appropriate alternatives is being conducted by Headquarters AFRC in accordance with the Council on Environmental Quality guidelines pursuant to the requirements of the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached Description of the Proposed Action and Alternatives (Atch 1) and solicit your comments concerning the proposal and any potential environmental issues of concern to you.

3. Please provide comments or information to engineering-environmental Management (e^2M), 2751 Prosperity Avenue, Suite 200, Fairfax, VA 22031, by 4 Oct 08. In addition, please let us know if you are interested in receiving a copy of the Draft Environmental Assessment and Draft Finding of No Significant Impact (FONSI), once they are available.

4. If members of your staff have any questions, please contact me at 817-782-6475.

RANDY H. VARNER
Environmental Director

Attachments:
(1) Description of the Proposed Action and Alternatives

Federal

Roy R. Queretaro 301 OG/RO
Director Airspace, Ranges, Airfields
1654 Lyons Drive, Room 142
NAS JRB Fort Worth, TX 76127

Cathy Gilmore
Regional NEPA Coordinator
USEPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202

Chief, Ecological Services
Ecological Services Regional Office
Southwest Region (Region 2)
U.S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

NEPA Program Coordinator
Austin, Texas Ecological Services
Field Office
U.S. Fish and Wildlife Service
Compass Bank Building
10711 Burnet Rd, Suite 200
Austin, TX 78758

NEPA Program Coordinator
Arlington, Texas Ecological Services
Field Office
U.S. Fish and Wildlife Service
711 Stadium Dr, Suite 252
Arlington, Texas 76011

NEPA Program Coordinator
Oklahoma Ecological Services Field Office
222 South Houston Ave, Suite A
Tulsa, OK 74127

Teresa Bruner
Southwest Region Regional Administrator
Federal Aviation Administration
FAA Southwest Region
2601 Meacham Boulevard
Fort Worth, TX 76137-4298

USAF Representative
ASW-910
Federal Aviation Administration
FAA Southwest Region, Fort Worth
2601 Meacham Blvd
Fort Worth, TX 76137-4298

State

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NEPA State Single Point of Contact
Budget Planning and Policy Office
1100 San Jacinto
Austin, TX 78701

Harold Stone
Intergovernmental Affairs
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Austin, TX 78744

F. Lawerence Oaks
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Dr. Bob Blackburn
State Historic Preservation Officer
State Historic Preservation Office
Oklahoma Historical Society
Oklahoma History Center
2401 North Laird Avenue
Oklahoma City, OK 73105

Local

John Promise
Director of Environment and Development
North Central Texas Council of Governments
616 Six Flags Drive, Suite 200
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NEPA Program Coordinator
Environmental Affairs Department
DFW Airport Administration Building
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DFW Airport, TX 75261

Ryan Cox, Director
Meacham International Airport System
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Waco Regional Airport Manager
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Brown County Clerk
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Brownwood, TX 76801

Jo Ann Hale
Coleman County Clerk
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Suite 105
Coleman, TX 76834

Ruby Lesley
Comanche County Clerk
County Courthouse
101 West Central
Comanche, TX 76442

Barbara Hoffman
Concho County District and County Clerk
County Courthouse
Paint Rock, TX 76866

Tina A. Smith
McCulloch County Clerk
County Courthouse Square
Brady, TX 76825

Carolyn Foster
Mills County District and County Clerk
1011 Fourth Street
Goldthwaite, TX 76844

Elesa Ocker
Runnels County Clerk
613 Courthouse Square
Ballinger, TX 76821

Kim Wells
San Saba County District and County Clerk
Courthouse
500 East Wallace Street
San Saba, TX 76877

Earlene Shriver
Comanche County Clerk
Comanche County Courthouse
315 Southwest 5th Street
Room 304
Lawton, OK 73501

Tribal

Mr. Gary McAdams, President
Wichita and Affiliated Tribes
Highway 281
P.O. Box 729
Anadarko, OK 73005

Chairman Alonzo Chalepah
Apache Tribe of Oklahoma
P.O. Box 1220
Anadarko, OK 73005

Dr. Robert Brooks
Oklahoma State Archeologist
Oklahoma Archeological Survey
111 East Chesapeake
Norman, OK 73019-0575

Chairperson LaRue Parker
Caddo Tribe
P.O. Box 487
Binger, OK 73009

Robert Cast
Tribal Historic Preservation Officer
Caddo Tribe of Oklahoma
Tribal Historic Preservation Office
P.O. Box 487
Binger, OK 73009

Governor Darrell Flyingman
Cheyenne-Arapaho Tribes
PO Box 137
Concho, OK 73022

Chairman Wallace Coffey
Comanche Indian Tribe
P.O. Box 908
Lawton, OK 73502

Delaware Tribe of West Oklahoma
NAGPRA/Cultural Preservation Office
P.O. Box 825
Anadarko, OK 73005

Chairman Jeff Hauser
Fort Sill Apache Tribe
Route 2, Box 121
Apache, OK 73006

Chairman Billy Evans Horse
Kiowa Tribe
P.O. Box 369
Carnegie, OK 73015

Karen Kaniatobe
Tribal Historic Preservation Officer
Absentee- Shawnee of Oklahoma
Cultural Preservation Department
2025 S. Gordon Cooper Drive
Shawnee, OK 74801

Terry Cole
Tribal Preservation Officer
Choctaw Nation of Oklahoma
P. O. Drawer 1210
Durant, OK 74702

Mr. Jeremy Finch
Tribal Historic Preservation Officer
Citizen Potawatomi Nation
1601 Gordon Cooper Drive
Shawnee, OK 74801

Perry Williams
Environmental Director
Tribal Environmental Office
Alabama-Coushatta Tribe of Texas
571 State Park Road
Livingston, TX 77351

Governor Frank Paiz
Ysleta Del Sur Pueblo Council
119 S. Old Pueblo Road
P.O. Box 17579
El Paso, TX 79907

Chairperson Juan Garza, Jr.
Kickapoo Traditional Tribe of Texas
Shawnee Agency HCR 1 Box 9700
Eagle Pass, TX 78852

Oklahoma Archeological Survey
THE UNIVERSITY OF OKLAHOMA

September 11, 2008

Randy H. Varner
301 FW Environmental Director
1215 Military Parkway
NAS JRB
Fort Worth, TX 76127

Re: *Description of the Proposed Action and Alternatives for an Environmental Assessment of the 301st Fighter Wing Managed Airspace, Naval Air Station Joint Reserve Base, Fort Worth, Texas.*

Dear Mr. Varner:

I have reviewed the above referenced action regarding it potential affect on Oklahoma's prehistoric and early historic archaeological resources. Based upon the provided documentation, it appears that the only involvement pertaining to Oklahoma is the use of Oklahoma airspace as training routes. Thus, there would be no ground disturbing activities in Oklahoma that would present a potential affect to on-ground cultural resources. For this reason, it is my opinion that there is "no effect" to Oklahoma's archaeological cultural heritage and further discussion of treatment measures or alternatives are unwarranted.

This review has been conducted in cooperation with the State Historic Preservation Office, Oklahoma Historical Society.

Sincerely,

Robert L. Brooks
State Archaeologist

Cc: SHPO

111 E. Chesapeake, Room 102, Norman, Oklahoma 73019-5111 PHONE: (405) 325-7211 FAX: (405) 325-7604
A UNIT OF ARTS AND SCIENCES SERVING THE PEOPLE OF OKLAHOMA

From: Jimmy Arterberry
Sent: Wednesday, September 24, 2008 1:23 PM
To: Randy Varner
Subject: EA of 301st Fighter Wing Managed Airspace

Greetings Mr. Varner:

I have just completed a review of the Description of the Proposed Action and Alternatives for an Environmental Assessment of the 301st Fighter Wing Managed Airspace, Naval Air Station Joint Reserve Base, Fort Worth, Texas, received by this office on the 15th of September, 2008. The Comanche Nation Office of Historic Preservation does wish to receive the draft Environmental Assessment for consideration and review. We look forward to the opportunity to comment on the proposed undertakings.

Thank you,

Jimmy Arterberry, THPO
Comanche Nation
584 Bingo Road
Lawton, Oklahoma 73507
(580) 353-0404
(580) 353-0407 fax

Oklahoma Historical Society *Founded May 27, 1893*

State Historic Preservation Office

Oklahoma History Center • 2401 North Laird Ave. • Oklahoma City, OK 73105-7914
(405) 521-6249 • Fax (405) 522-0816 • www.okhistory.org/shpo/shpom.htm

October 7, 2008

Mr. Randy H. Varner
301 FW Environmental Director
1215 Military Parkway
NAS JRB Fort Worth, TX 76127

RE: File #2684-08; Air Force Reserve Command Readiness Training in Airspace Project

Dear Mr. Varner:

We have received and reviewed the documentation concerning the referenced project. Additionally, we have examined the information contained in the Oklahoma Landmarks Inventory (OLI) files and other materials on historic resources available in our office. We find that there are no historic properties affected by the referenced project.

Thank you for the opportunity to comment on this project. We look forward to working with you in the future.

If you have any questions, please contact Charles Wallis, RPA, Historical Archaeologist, at 405/521-6381.

Should further correspondence pertaining to this project be necessary, the above underlined file number must be referenced. Thank you.

Sincerely,

Melvena Heisch
Deputy State Historic
Preservation Officer

MH:jr

TEXAS PARKS & WILDLIFE

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October 31, 2008

Randy H. Varner
301 FW Environmental Director
1215 Military Parkway
NAS JRB Fort Worth, TX 76127

RE: Draft Environmental Assessment of 301st Fighter Wing (301 FW) Managed Airspace, NAS JRB Fort Worth (Tarrant County)

Dear Mr. Varner:

The Texas Parks and Wildlife Department (TPWD) has reviewed the Draft Environmental Assessment (DEA) regarding airspace operations within the Region of Influence (ROI) defined for this DEA as the military airspace managed by the 301 FW and the land areas directly underneath that airspace. The 301 FW is an Air Force Reserve Command located at the Naval Air Station Joint Reserve Base (NAS JRB) Fort Worth. The ROI includes NAS JRB Fort Worth which encompasses 1,805 acres in north-central Texas in Tarrant County. The airspace managed by the 301 FW extends north to El Reno, Oklahoma, approximately 50 miles to the east of the City of Dallas; extends west approximately 40 miles southeast of the City of Odessa, Texas; and extends south approximately 15 miles from the Texas-Mexico border. The 301 FW managed airspace encompasses airspace in portions of 49 Texas counties.

The DEA has been prepared to address an increase in airspace operations within existing managed airspace primarily as a result of recent Base Realignment and Closure (BRAC) changes. An increased number of airspace operations within existing 301 FW managed airspace would result in an increase in the number of hours that pilots spend in the airspace. The DEA indicates that the total airspace operations associated with 301 FW managed airspace would increase by approximately 22 percent under the proposed action, from a baseline of 15,861 annual operations to 19,295. Total airspace operations would increase by approximately 75 percent under the forecasted scenario, from the same baseline of 15,861 annual operations to 27,766.

The DEA indicates that an increase in the number of aircraft/bird strikes within the ROI is likely because pilots would be spending more time in the airspace. The DEA also indicates that the Bird/Wildlife Aircraft Strike Hazard (BASH) plan does not and cannot account for all of the airspace utilized by the 301 FW, particularly above natural areas and private lands, because the BASH plan mainly

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AUSTIN, TEXAS 78744-3291
512.389.4800
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applies to modification of areas surrounding an airfield by making the areas unattractive to birds.

Although the DEA appears to adequately address potential impacts to fish and wildlife resources including rare, threatened, and endangered species and their habitats, TPWD provides the following recommendations:

- The U.S. Air Force should continue its program for studying bird migrations, bird flight patterns, and past strikes to develop predictions of where and when bird/wildlife-aircraft strikes might occur so that such incidents can be avoided or minimized.

- The 301 FW should continue to record and report aircraft/bird strikes while also identifying the species of bird occurring in the strike.

- Should it be determined that the increase in operations within the 301 FW managed airspace has caused a substantial increase in bird strikes, bat strikes, or noise impacts to terrestrial wildlife and has resulted in a major adverse effect to a species, then the 301 FW should coordinate with TPWD and the U.S. Fish and Wildlife Service, as appropriate, to reconsider management practices that would reduce the adverse effect of continued operations to negligible, minor, or moderate.

Thank you for your consideration of these recommendations. I can be contacted at karen.hardin@tpwd.state.tx.us and 903-675-4447 if you have any questions.

Sincerely,

Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

kbh/13438

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APPENDIX D

PUBLIC INVOLVEMENT

Appendix D

Public Involvement

PUBLIC NOTICE

Notice of Availability
Finding of No Significant Impact for the Environmental Assessment
Addressing the 301st Fighter Wing Managed Airspace,
Naval Air Station Joint Reserve Base, Fort Worth, Texas

Naval Air Station Joint Reserve Base, Texas – An Environmental Assessment (EA) of 301st Fighter Wing (301 FW) Managed Airspace, Naval Air Station Joint Reserve Base (NAS JRB), Fort Worth, Texas is being prepared. The Proposed Action is to continue readiness training operations in airspace components managed by the 301 FW to ensure users can continue to accomplish required mission readiness training requirements. This training would involve the continued use of the 301 FW managed airspace at proposed increased utilization levels. There would be no changes in personnel or construction activities required as part of the Proposed Action.

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25 March 2009

Fort Worth Central Public Library
500 West 3rd Street
Fort Worth, TX 76102
(817) 871-7323

Dear Sir or Madam:

The public notice shown below was published in the *Brownwood Bulletin* and the *Lawton Constitution* on March 27, 2009. Please place the enclosed copy of the Draft Final Environmental Assessment either on reserve or in the reference section of your library. Members of the public have been invited to review the document at your library until April 26, 2009. The document should not leave the library.

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If you have any questions, please contact me at (703) 752-7755, extension 107. Thank you.

Sincerely,

engineering-environmental Management, Inc.

Suanne Collinsworth

Suanne Collinsworth, Project Manager

25 March 2009

Brownwood Public Library
600 Carnegie Boulevard
Brownwood, TX 76801
(325) 646-0155

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Sincerely,

engineering-environmental Management, Inc.

Suanne Collinsworth

Suanne Collinsworth, Project Manager

25 March 2009

Lawton Library
110 Southwest 4th Street
Lawton, OK 73501
(580) 581-3450

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Sincerely,

engineering-environmental Management, Inc.

Suanne Collinsworth

Suanne Collinsworth, Project Manager

25 March 2009

F. M (Buck) Richards Memorial Library
1106 S. Blackburn Street
Brady, TX 76825
(325) 597-2617

Dear Sir or Madam:

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Sincerely,

engineering-environmental Management, Inc.

Suanne Collinsworth, Project Manager

25 March 2009

Tom Green County Main Library
113 West Beauregard Street
San Angelo, Texas 76903
(325) 655-7321

Dear Sir or Madam:

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Sincerely,

engineering-environmental Management, Inc.

Suanne Collinsworth

Suanne Collinsworth, Project Manager

25 March 2009

Killeen Public Library
205 East Church Avenue
Killeen, TX 76541
(254) 501-8990

Dear Sir or Madam:

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If you have any questions, please contact me at (703) 752-7755, extension 107. Thank you.

Sincerely,

engineering-environmental Management, Inc.

Suanne Collinsworth

Suanne Collinsworth, Project Manager

Sorrel Canyon Ranch
5200 FM 2525
Brownwood, Texas 76802

MEMO

To: 301 FW Airspace EA

From: Janice Garrett

To Whom It May Concern:

My husband and I own a 600 acre horse ranch in Brownwood, Texas.

We foresee no significant negative impact from the training proposed in our airspace. Except for an occasional sonic boom, the high altitude of these aircraft produce insignificant noise pollution and offer no disturbance to our livestock.

TEXAS
PARKS &
WILDLIFE

Life's better outside.™

Commissioners

Peter M. Holt
Chairman
San Antonio

T. Dan Friedkin
Vice-Chairman
Houston

Mark E. Bivins
Amarillo

J. Robert Brown
El Paso

Antonio Falcon, M.D.
Rio Grande City

Karen J. Hixon
San Antonio

Margaret Martin
Boerne

Philip Montgomery
Dallas

John D. Parker
Lufkin

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

April 16, 2009

"301 FW Airspace EA"
c/o Suanne Collinsworth
e^2M
2751 Prosperity Avenue, Suite 200
Fairfax, VA 22031

RE: Draft Final Environmental Assessment and FONSI
301st Fighter Wing Managed Airspace
NAS JRB Fort Worth (Tarrant County)

Dear Ms. Collinswoth:

The Texas Parks and Wildlife Department (TPWD) has reviewed the Finding of No Significant Impact (FONSI) and Draft Final Environmental Assessment (EA) Addressing the 301st Fighter Wing (301 FW) Managed Airspace.

The EA addresses previous recommendations provided by TPWD regarding potential impacts to fish and wildlife resources. TPWD has no additional comments or concerns regarding the proposed actions and offers no objections to the FONSI.

Please contact me with any questions at karen.hardin@tpwd.state.tx.us or 512-917-4155.

Sincerely,

Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

kbh/13924(13438)

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

APPENDIX E

CALCULATIONS TO SUPPORT THE AIR QUALITY IMPACT ANALYSES

Note: The aircraft operational modes used for modeling air quality are distinguished by fuel flow rates, engine thrust setting, and other factors. The four main aircraft operation modes are taxi/idle, approach, intermediate/climb out, and takeoff/military. According to the USAF IERA, approach mode is measured from the moment an aircraft enters the air quality mixing layer (3,000 feet AGL) until the time when the aircraft lands. This analysis did not estimate air quality emissions above the mixing layer or on the ground (idle/initial takeoff and landings). Therefore approach mode best fits the expected load, and was used in this analysis so that the highest potential emissions would be shown.

Total 301 FW Air Quality Emissions for Baseline, Proposed, and Forecasted Scenarios

Airspace	Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
Falcon Range	2.261	0.745	21.322	0.593	4.002	0.824	23.267	0.761	4.835	1.117	31.880	0.915
Brady High	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brady Low	20.905	0.682	3.303	4.271	40.918	2.835	11.814	14.862	27.328	1.213	10.996	5.357
Brady North	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Brownwood	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
VR-101	0.028	0.001	0.061	0.000	0.028	0.001	0.061	0.000	0.829	0.328	0.184	0.168
VR-104	0.083	0.002	0.182	0.000	0.083	0.002	0.182	0.000	0.595	0.212	0.261	0.108
VR-118	2.934	0.063	0.666	0.549	3.002	0.071	0.824	0.568	3.666	0.124	1.439	0.748
VR-143	0.763	0.249	7.549	0.146	0.707	0.274	7.960	0.162	0.851	0.312	8.894	0.178
VR-186	2.324	2.638	12.280	1.136	2.257	2.902	13.046	1.233	2.397	2.930	13.349	1.249
VR-1110	0.527	0.013	1.100	0.005	0.337	0.008	0.560	0.016	0.564	0.017	0.964	0.019
VR-1124	0.167	0.006	0.374	0.001	0.106	0.008	0.208	0.006	0.216	0.015	0.418	0.008
VR-1128	0.103	0.008	0.280	0.008	0.130	0.014	0.377	0.020	0.241	0.025	0.727	0.026
VR-1137	0.103	0.008	0.280	0.008	0.130	0.014	0.377	0.020	0.241	0.025	0.727	0.026
IR-103	1.688	0.097	2.138	0.418	22.323	0.550	3.801	9.066	8.431	0.273	3.141	3.071
IR-105	0.186	0.030	0.985	0.045	1.447	0.081	2.155	0.508	1.945	0.104	2.531	0.710
IR-123	0.763	0.249	7.549	0.146	0.707	0.274	7.960	0.162	0.851	0.312	8.894	0.178
IR-124	2.324	2.638	12.280	1.136	2.257	2.902	13.046	1.233	2.397	2.930	13.349	1.249
IR-139	0.202	0.008	0.415	0.016	0.244	0.014	0.523	0.030	0.272	0.019	0.626	0.040
SR-128	0.299	0.023	0.464	0.071	0.337	0.028	0.490	0.091	0.339	0.033	0.509	0.092
SR-270	0.299	0.023	0.464	0.071	0.337	0.028	0.490	0.091	0.338	0.030	0.500	0.091
Total	**35.958**	**7.485**	**71.693**	**8.620**	**79.349**	**10.830**	**87.142**	**28.829**	**56.333**	**10.020**	**99.387**	**14.234**

Delta Change in Air Quality Emissions for Baseline, Proposed, and Forecasted Scenarios

Alternative	NO_x	VOC	CO	PM_{10}
Baseline	35.958	7.485	71.693	8.620
Proposed	43.392	3.344	15.449	20.209
Forecasted	20.375	2.535	27.695	5.614

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Oklahoma and Texas Counties Within Proposed Action

Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
2001	312,518	264,939	1,358,087	704,628

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 7 October 2008.

Determination Significance (Significance Threshold = 10%) for Proposed Flight Operations

	Point and Area Sources Combined			
	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
Minimum - 2001	312,518	264,939	1,358,087	704,628
Baseline Emissions	35.958	7.485	71.693	8.620
Baseline %	**0.012%**	**0.003%**	**0.005%**	**0.001%**

Determination Significance (Significance Threshold = 10%) for Proposed Flight Operations

	Point and Area Sources Combined			
	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
Minimum - 2001	312,518	264,939	1,358,087	704,628
Proposed Emissions	79.349	10.830	87.142	28.829
Proposed %	**0.025%**	**0.004%**	**0.006%**	**0.004%**

Determination Significance (Significance Threshold = 10%) for Proposed Flight Operations

	Point and Area Sources Combined			
	NO_x (tpy)	VOC (tpy)	CO (tpy)	PM_{10} (tpy)
Minimum - 2001	312,518	264,939	1,358,087	704,628
Forecasted Emissions	56.333	10.020	99.387	14.234
Forecasted %	**0.018%**	**0.004%**	**0.007%**	**0.002%**

Aircraft Type	Falcon Range (R-5601 C/D/E)																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
A-10	6	80	140	0.9	275	0.7	10%	10%	10%	23.3%	42	9.8	0.0030	0.0011	0.0194	0.004689	0.0406	0.0150	0.2591	0.062522	0.0711	0.0263	0.4534	0.109414
Alpha	55	108	108	0.9	375	2.0	10%	20%	20%	36.7%	120	44	0.0006	0.0171	0.6109	0.000026	0.0011	0.0335	1.1996	0.000050	0.0011	0.0335	1.1996	0.000050
AT-38	1200	1200	1200	0.9	420	0.5	10%	10%	40%	33.3%	30	10	0.6126	0.6512	20.0641	0.383418	0.6126	0.6512	20.0641	0.383418	0.6126	0.6512	20.0641	0.383418
B-1	6	6	6	0.85	400	1.0	2%	3%	20%	11.7%	60	7	0.0581	0.0009	0.0065	0.026844	0.0581	0.0009	0.0065	0.026844	0.0581	0.0009	0.0065	0.026844
B-2	6	12	6	0.9	350	1.0	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	22	25	35	0.9	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
CH-146	0	90	90	1	110	2.0	75%	25%	0%	100.0%	120	120	0.0000	0.0000	0.0000	0.000000	1.2023	0.0427	1.0884	0.010950	1.2023	0.0427	1.0884	0.010950
CH-47	14	16	16	1	150	0.3	10%	25%	10%	38.3%	18	6.9	0.0061	0.0003	0.0042	0.000040	0.0070	0.0003	0.0048	0.000046	0.0070	0.0003	0.0048	0.000046
F-18	245	210	215	0.9	400	0.6	10%	10%	10%	23.3%	36	8.4	0.4851	0.0481	0.3943	0.004451	0.4158	0.0412	0.3380	0.003815	0.4257	0.0422	0.3461	0.003906
F-16	523	825	1135	0.9	420	0.6	5%	5%	10%	13.3%	36	4.8	0.9064	0.0171	0.0905	0.172486	1.4297	0.0269	0.1428	0.272087	1.9670	0.0370	0.1964	0.374325
F-22	6	6	6	90	420	0.6	5%	5%	15%	15.0%	36	5.4	0.0076	0.0008	0.0062	0.000070	0.0076	0.0008	0.0062	0.000070	0.0076	0.0008	0.0062	0.000070
F-5	0	0	500	0.9	420	0.5	10%	10%	40%	33.3%	30	10	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.2552	0.2712	8.3572	0.004461
UH-60	60	75	75	1	150	0.8	75%	25%	0%	100.0%	48	48	0.1814	0.0089	0.1260	0.001200	0.2268	0.0111	0.1575	0.001500	0.2268	0.0111	0.1575	0.001500
TOTAL													**2.2610**	**0.7453**	**21.3223**	**0.5932**	**4.0017**	**0.8236**	**23.2671**	**0.7613**	**4.8345**	**1.1172**	**31.8803**	**0.9150**

Aircraft Type	Brady High																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
A-10	4	1	36	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	6	133	72	0	300	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	2	2	400	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	1	3	12	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	3	1	36	0	350	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	2	6	36	0	210	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	3	5	24	0	250	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	7	12	96	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	7	12	96	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-16	1472	1764	1180	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-18	18	202	720	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	6	10	18	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-35	8	9	18	0	500	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-10	4	3	24	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-135	4	1	24	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
MH-47	6	7	12	0	150	0.3	0%	0%	0%	0.0%	18	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	1233	1310	2300	0	240	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	2	4	24	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
TOTAL													0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Aircraft Type	Brady Low																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	1447	540	1764	0	450	1.25	5%	20%	70%	48.3%	75	36.25	18.9383	0.3563	1.8911	3.604032	7.0675	0.1330	0.7057	1.344974	23.0872	0.4343	2.3054	4.393581
F-18	18	360	202	0	450	1.25	5%	20%	70%	48.3%	75	36.25	0.1538	0.0152	0.1250	0.001411	3.0763	0.3048	2.5006	0.028223	1.7262	0.1710	1.4031	0.015836
B-1	2	380	2	0	500	1.25	5%	20%	70%	48.3%	75	36.25	0.1003	0.0015	0.0113	0.046339	19.0656	0.2914	2.1438	8.804333	0.1003	0.0015	0.0113	0.046339
B-2	1	12	3	0	500	1.25	5%	20%	70%	48.3%	75	36.25	0.0092	0.0040	0.0092	0.020379	0.1105	0.0476	0.1105	0.244547	0.0276	0.0119	0.0276	0.061137
B-52	3	35	1	0	350	1.25	5%	20%	70%	48.3%	75	36.25	0.1755	0.0377	0.1444	0.097803	2.0474	0.4403	1.6842	1.141029	0.0585	0.0126	0.0481	0.032601
T-43	2	24	4	0	300	1.25	5%	20%	70%	48.3%	75	36.25	0.0171	0.0017	0.0061	0.000143	0.2056	0.0206	0.0733	0.001713	0.0343	0.0034	0.0122	0.000285
AT-38	6	36	133	0	300	1	5%	20%	70%	48.3%	60	29	0.0089	0.0094	0.2909	0.005560	0.0533	0.0567	1.7456	0.033357	0.1969	0.2093	6.4489	0.123237
T-1	1	24	10	0	240	1	5%	20%	70%	48.3%	60	29	0.0012	0.0020	0.0085	0.000851	0.0294	0.0485	0.2031	0.020425	0.0123	0.0202	0.0846	0.008511
A-10	10	18	7	0	300	1.25	5%	20%	70%	48.3%	75	36.25	0.0188	0.0070	0.1198	0.028909	0.0338	0.0125	0.2156	0.052035	0.0131	0.0049	0.0839	0.020236
C-130	2	35	6	0	210	1.5	5%	20%	70%	48.3%	90	43.5	0.0202	0.0021	0.0118	0.010596	0.3540	0.0371	0.2071	0.185423	0.0607	0.0064	0.0355	0.031787
C-17	3	24	5	0	250	1.5	5%	20%	70%	48.3%	90	43.5	0.6189	0.0142	0.0594	0.262187	4.9512	0.1140	0.4750	2.097496	1.0315	0.0237	0.0990	0.436978
F-15	7	48	12	0	450	1.25	5%	20%	70%	48.3%	75	36.25	0.2033	0.0831	0.0312	0.042678	1.3943	0.5697	0.2136	0.292648	0.3486	0.1424	0.0534	0.073162
F-15	7	48	12	0	450	1.25	5%	20%	70%	48.3%	75	36.25	0.2033	0.0831	0.0312	0.042678	1.3943	0.5697	0.2136	0.292648	0.3486	0.1424	0.0534	0.073162
KC-135	4	12	1	0	350	1.5	5%	20%	70%	48.3%	90	43.5	0.1325	0.0395	0.2807	0.080548	0.3975	0.1184	0.8420	0.241644	0.0331	0.0099	0.0702	0.020137
KC-10	4	12	3	0	350	1.5	5%	20%	70%	48.3%	90	43.5	0.2165	0.0228	0.0980	0.027115	0.6494	0.0684	0.2939	0.081344	0.1623	0.0171	0.0735	0.020336
F-22	6	18	10	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-35	8	18	9	0	500	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
MH-47	6	8	7	1	150	0.3	15%	25%	60%	60.0%	18	10.8	0.0041	0.0002	0.0028	0.000027	0.0054	0.0003	0.0038	0.000036	0.0048	0.0002	0.0033	0.000032
C-172	1	1	1	0	100	6	80%	20%	0%	100.0%	360	360	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009
TOTAL													**20.9046**	**0.6819**	**3.3034**	**4.2713**	**40.9180**	**2.8349**	**11.8138**	**14.8619**	**27.3285**	**1.2134**	**10.9956**	**5.3574**

Aircraft Type	Brady North																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
A-10	10	7	36	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	6	133	72	0	300	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	2	2	400	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	1	3	12	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	3	1	36	0	350	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	2	6	36	0	210	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	3	5	24	0	250	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	7	12	96	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	7	12	24	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-16	564	462	1180	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-18	18	190	720	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	6	10	18	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-35	8	9	18	0	500	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-10	4	3	24	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-135	4	1	24	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	1	10	48	0	240	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	2	4	24	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
TOTAL													**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Aircraft Type	Brownwood																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	575	498	1121	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-18	23	221	857	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	4	4	400	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	2	4	15	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	3	2	38	0	350	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	2	4	21	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	7	131	72	0	300	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	4	15	52	0	240	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	11	8	36	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	2	7	38	0	210	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	3	5	22	0	250	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	7	13	91	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	8	13	91	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-135	4	1	22	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-10	4	3	22	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	6	10	16	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-35	8	9	16	0	500	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
TOTAL													**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Aircraft Type	VR-101																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	0	10	25	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-18	0	0	5	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	0	0	0	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	0	0	0	0	300	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	0	0	0	0	240	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	0	9	11	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	0	0	0	0	210	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-135	0	0	0	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-10	0	0	0	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	10	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-35	0	0	25	0	500	1	21%	29%	50%	66.7%	60	40	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.8013	0.3274	0.1228	0.168189
C-172	1	1	1	0	100	2	80%	20%	0%	100.0%	120	120	0.0275	0.0007	0.0607	0.000003	0.0275	0.0007	0.0607	0.000003	0.0275	0.0007	0.0607	0.000003
TOTAL													**0.0275**	**0.0007**	**0.0607**	**0.0000**	**0.0275**	**0.0007**	**0.0607**	**0.0000**	**0.8288**	**0.3281**	**0.1835**	**0.1682**

Aircraft Type	VR-104																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	8	12	25	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-18	0	1	3	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	0	0	0	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	8	10	16	0	300	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	2	6	9	0	240	1	0%	0%	0%	0.0%	60	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	3	8	11	0	300	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	3	10	12	0	210	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-135	0	0	0	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
KC-10	0	0	0	0	350	1.5	0%	0%	0%	0.0%	90	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	15	0	500	1.25	0%	0%	0%	0.0%	75	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-35	0	0	16	0	500	1	10%	40%	50%	66.7%	60	40	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.5128	0.2096	0.0786	0.107641
C-172	1	1	1	0	100	6	80%	20%	0%	100.0%	360	360	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009
TOTAL													**0.0826**	**0.0020**	**0.1822**	**0.0000**	**0.0826**	**0.0020**	**0.1822**	**0.0000**	**0.5954**	**0.2116**	**0.2608**	**0.1076**

Aircraft Type	VR-118																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	978	989	1111	0	450	0.5	10%	10%	20%	26.7%	30	8	2.8248	0.0531	0.2821	0.537577	2.8566	0.0537	0.2852	0.543624	3.2090	0.0604	0.3204	0.610683
F-18	3	10	24	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0057	0.0006	0.0046	0.000052	0.0189	0.0019	0.0153	0.000173	0.0453	0.0045	0.0368	0.000415
B-1	0	0	2	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0221	0.0003	0.0025	0.010226
B-2	0	0	2	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0041	0.0018	0.0041	0.008995
B-52	0	0	2	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0310	0.0067	0.0255	0.017267
T-43	0	0	2	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0057	0.0006	0.0020	0.000047
AT-38	3	8	11	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0018	0.0020	0.0602	0.001150	0.0049	0.0052	0.1605	0.003067	0.0067	0.0072	0.2207	0.004218
T-1	0	0	2	0	240	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0014	0.0022	0.0093	0.000939
A-10	0	2	2	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0012	0.0005	0.0079	0.001914	0.0012	0.0005	0.0079	0.001914
C-130	5	10	12	0	210	1	10%	10%	20%	26.7%	60	16	0.0186	0.0019	0.0109	0.009743	0.0372	0.0039	0.0218	0.019486	0.0446	0.0047	0.0261	0.023383
C-17	0	0	2	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.1518	0.0035	0.0146	0.064291
F-15	0	0	2	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0128	0.0052	0.0020	0.002691
F-15	0	0	2	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0128	0.0052	0.0020	0.002691
F-22	0	0	18	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0339	0.0034	0.0276	0.000311
UAV	5	6	22	0	50	2	50%	25%	25%	83.3%	120	100	0.0001	0.0035	0.1262	0.000005	0.0001	0.0042	0.1515	0.000006	0.0005	0.0155	0.5554	0.000023
C-172	1	1	1	0	100	6	80%	20%	0%	100.0%	360	360	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009
TOTAL													**2.9336**	**0.0631**	**0.6662**	**0.5485**	**3.0015**	**0.0714**	**0.8244**	**0.5683**	**3.6655**	**0.1236**	**1.4390**	**0.7481**

Aircraft Type	VR-143																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	26.7%	30	8	0.0375	0.0007	0.0037	0.007146	0.0433	0.0008	0.0043	0.008245	0.0491	0.0009	0.0049	0.009344
F-16	*13*	15	17	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0375	0.0007	0.0037	0.007146	0.0433	0.0008	0.0043	0.008245	0.0491	0.0009	0.0049	0.009344
F-18	*3*	7	9	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0057	0.0006	0.0046	0.000052	0.0132	0.0013	0.0107	0.000121	0.0170	0.0017	0.0138	0.000156
B-1	*0*	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	*0*	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	*0*	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	*0*	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	315	341	374	0	300	0.75	10%	10%	20%	26.7%	45	12	0.1930	0.2051	6.3202	0.120777	0.2089	0.2220	6.8419	0.130746	0.2291	0.2435	7.5040	0.143398
T-1	21	32	35	0	240	1	10%	10%	20%	26.7%	60	16	0.0142	0.0234	0.0980	0.009860	0.0216	0.0357	0.1494	0.015025	0.0237	0.0390	0.1634	0.016434
A-10	6	8	9	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0037	0.0014	0.0238	0.005742	0.0050	0.0018	0.0317	0.007656	0.0056	0.0021	0.0357	0.008613
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	2	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0128	0.0052	0.0020	0.002691	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	10	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0189	0.0019	0.0153	0.000173
C-172	6	5	6	0	100	6	80%	20%	0%	100.0%	360	360	0.4955	0.0121	1.0931	0.000055	0.4129	0.0101	0.9109	0.000046	0.4955	0.0121	1.0931	0.000055
T-6	7	20	120	0	210	0.5	10%	10%	20%	26.7%	30	8	0.0007	0.0007	0.0037	0.000000	0.0020	0.0019	0.0106	0.000000	0.0118	0.0112	0.0633	0.000000
TOTAL													**0.7631**	**0.2492**	**7.5491**	**0.1463**	**0.7069**	**0.2736**	**7.9595**	**0.1618**	**0.8505**	**0.3124**	**8.8935**	**0.1782**

Aircraft Type	VR-186																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	26.7%	30	8	0.1531	0.0029	0.0153	0.029133	0.0664	0.0012	0.0066	0.012642	0.0895	0.0017	0.0089	0.017040
F-16	53	23	31	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0019	0.0002	0.0015	0.000017	0.0057	0.0006	0.0046	0.000052	0.0057	0.0006	0.0046	0.000052
F-18	1	3	3	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	2350	2589	2610	0	240	1	10%	10%	20%	26.7%	60	16	1.5883	2.6203	10.9722	1.103435	1.7499	2.8868	12.0881	1.215656	1.7641	2.9102	12.1861	1.225517
A-10	4	5	6	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0025	0.0009	0.0159	0.003828	0.0031	0.0012	0.0198	0.004785	0.0037	0.0014	0.0238	0.005742
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	10	20	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0189	0.0019	0.0153	0.000173	0.0377	0.0037	0.0307	0.000346
C-172	7	5	6	0	100	6	80%	20%	0%	100.0%	360	360	0.5780	0.0141	1.2753	0.000064	0.4129	0.0101	0.9109	0.000046	0.4955	0.0121	1.0931	0.000055
T-6	0	2	4	0	210	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0002	0.0002	0.0011	0.000000	0.0004	0.0004	0.0021	0.000000
TOTAL													**2.3238**	**2.6384**	**12.2801**	**1.1365**	**2.2570**	**2.9018**	**13.0464**	**1.2334**	**2.3965**	**2.9300**	**13.3493**	**1.2488**

Aircraft Type	VR-1110																						
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	9	29	34	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0260	0.0005	0.0026	0.004947	0.0838	0.0016	0.0084	0.015940	0.0982	0.0018	0.0098	0.018689
F-18	3	3	5	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0057	0.0006	0.0046	0.000052	0.0057	0.0006	0.0046	0.000052	0.0094	0.0009	0.0077	0.000087
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	0	0	0	0	240	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	23	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0434	0.0043	0.0353	0.000398
C-172	6	3	5	0	100	6	80%	20%	0%	100.0%	360	360	0.4955	0.0121	1.0931	0.000055	0.2477	0.0060	0.5465	0.000027	0.4129	0.0101	0.9109	0.000046
TOTAL													**0.5271**	**0.0131**	**1.1003**	**0.0051**	**0.3371**	**0.0082**	**0.5595**	**0.0160**	**0.5639**	**0.0171**	**0.9636**	**0.0192**

Aircraft Type	VR-1124																						
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	0	7	8	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0202	0.0004	0.0020	0.003848	0.0231	0.0004	0.0023	0.004397
F-18	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	2	5	7	0	240	1	10%	10%	20%	26.7%	60	16	0.0014	0.0022	0.0093	0.000939	0.0034	0.0056	0.0233	0.002348	0.0047	0.0078	0.0327	0.003287
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	12	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0226	0.0022	0.0184	0.000208
C-172	2	1	2	0	100	6	80%	20%	0%	100.0%	360	360	0.1652	0.0040	0.3644	0.000018	0.0826	0.0020	0.1822	0.000009	0.1652	0.0040	0.3644	0.000018
TOTAL													**0.1665**	**0.0063**	**0.3737**	**0.0010**	**0.1062**	**0.0080**	**0.2075**	**0.0062**	**0.2156**	**0.0145**	**0.4177**	**0.0079**

Aircraft Type	VR-1128																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	2	3	3	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0058	0.0001	0.0006	0.001099	0.0087	0.0002	0.0009	0.001649	0.0087	0.0002	0.0009	0.001649
F-18	2	3	3	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0038	0.0004	0.0031	0.000035	0.0057	0.0006	0.0046	0.000052	0.0057	0.0006	0.0046	0.000052
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	4	8	15	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0025	0.0026	0.0803	0.001534	0.0049	0.0052	0.1605	0.003067	0.0092	0.0098	0.3010	0.005751
T-1	2	3	5	0	240	1	10%	10%	20%	26.7%	60	16	0.0014	0.0022	0.0093	0.000939	0.0020	0.0033	0.0140	0.001409	0.0034	0.0056	0.0233	0.002348
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	2	7	8	0	210	1	10%	10%	20%	26.7%	60	16	0.0074	0.0008	0.0044	0.003897	0.0260	0.0027	0.0152	0.013640	0.0298	0.0031	0.0174	0.015589
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	10	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0189	0.0019	0.0153	0.000173
C-172	1	1	2	0	100	6	80%	20%	0%	100.0%	360	360	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009	0.1652	0.0040	0.3644	0.000018
TOTAL													**0.1034**	**0.0081**	**0.2798**	**0.0075**	**0.1299**	**0.0140**	**0.3774**	**0.0198**	**0.2407**	**0.0251**	**0.7269**	**0.0256**

Aircraft Type	VR-1137																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	2	3	3	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0058	0.0001	0.0006	0.001099	0.0087	0.0002	0.0009	0.001649	0.0087	0.0002	0.0009	0.001649
F-18	2	3	3	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0038	0.0004	0.0031	0.000035	0.0057	0.0006	0.0046	0.000052	0.0057	0.0006	0.0046	0.000052
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	4	8	15	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0025	0.0026	0.0803	0.001534	0.0049	0.0052	0.1605	0.003067	0.0092	0.0098	0.3010	0.005751
T-1	2	3	5	0	240	1	10%	10%	20%	26.7%	60	16	0.0014	0.0022	0.0093	0.000939	0.0020	0.0033	0.0140	0.001409	0.0034	0.0056	0.0233	0.002348
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	2	7	8	0	210	1	10%	10%	20%	26.7%	60	16	0.0074	0.0008	0.0044	0.003897	0.0260	0.0027	0.0152	0.013640	0.0298	0.0031	0.0174	0.015589
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	10	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0189	0.0019	0.0153	0.000173
C-172	1	1	2	0	100	6	80%	20%	0%	100.0%	360	360	0.0826	0.0020	0.1822	0.000009	0.0826	0.0020	0.1822	0.000009	0.1652	0.0040	0.3644	0.000018
TOTAL													**0.1034**	**0.0081**	**0.2798**	**0.0075**	**0.1299**	**0.0140**	**0.3774**	**0.0198**	**0.2407**	**0.0251**	**0.7269**	**0.0256**

Aircraft Type	IR-103																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%															
F-16	265	483	370	0	450	0.5	10%	10%	20%	26.7%	30	8	0.7654	0.0144	0.0764	0.145663	1.3951	0.0262	0.1393	0.265491	1.0687	0.0201	0.1067	0.203378
F-18	78	4	8	0	450	0.5	10%	10%	20%	26.7%	30	8	0.1471	0.0146	0.1196	0.001350	0.0075	0.0007	0.0061	0.000069	0.0151	0.0015	0.0123	0.000138
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	69	65	70	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0423	0.0449	1.3844	0.026456	0.0398	0.0423	1.3042	0.024922	0.0429	0.0456	1.4045	0.026839
T-1	0	0	0	0	240	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	10	0	21	0	210	1	10%	10%	20%	26.7%	60	16	0.0372	0.0039	0.0218	0.019486	0.0000	0.0000	0.0000	0.000000	0.0781	0.0082	0.0457	0.040921
C-17	7	273	87	0	250	1	10%	10%	20%	26.7%	60	16	0.5312	0.0122	0.0510	0.225019	20.7152	0.4769	1.9873	8.775731	6.6015	0.1520	0.6333	2.796662
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	200	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.3772	0.0374	0.3066	0.003460
C-172	2	2	3	0	100	6	80%	20%	0%	100.0%	360	360	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018	0.2477	0.0060	0.5465	0.000027
Alpha	7	0	5	0.9	375	2.0	30%	20%	20%	56.7%	120	68	0.0001	0.0034	0.1202	0.000005	0.0000	0.0000	0.0000	0.000000	0.0001	0.0024	0.0858	0.000004
TOTAL													**1.6884**	**0.0974**	**2.1377**	**0.4180**	**22.3228**	**0.5503**	**3.8012**	**9.0662**	**8.4313**	**0.2732**	**3.1414**	**3.0714**

Aircraft Type	IR-105																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%															
F-16	0	2	8	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0058	0.0001	0.0006	0.001099	0.0231	0.0004	0.0023	0.004397
F-18	4	8	10	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0075	0.0007	0.0061	0.000069	0.0151	0.0015	0.0123	0.000138	0.0189	0.0019	0.0153	0.000173
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	33	65	79	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0202	0.0215	0.6621	0.012653	0.0398	0.0423	1.3042	0.024922	0.0484	0.0514	1.5851	0.030290
T-1	0	0	0	0	240	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	1	15	21	0	250	1	10%	10%	20%	26.7%	60	16	0.0759	0.0017	0.0073	0.032146	1.1382	0.0262	0.1092	0.482183	1.5935	0.0367	0.1529	0.675056
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	7	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0132	0.0013	0.0107	0.000121
C-172	1	3	3	0	100	6	80%	20%	0%	100.0%	360	360	0.0826	0.0020	0.1822	0.000009	0.2477	0.0060	0.5465	0.000027	0.2477	0.0060	0.5465	0.000027
Alpha	7	10	12	0.9	375	2.0	30%	20%	30%	60.0%	120	72	0.0001	0.0036	0.1272	0.000005	0.0002	0.0051	0.1818	0.000008	0.0002	0.0061	0.2181	0.000009
TOTAL													**0.1863**	**0.0296**	**0.9849**	**0.0449**	**1.4468**	**0.0813**	**2.1545**	**0.5084**	**1.9450**	**0.1039**	**2.5310**	**0.7101**

Aircraft Type	IR-123																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%															
F-16	13	15	17	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0375	0.0007	0.0037	0.007146	0.0433	0.0008	0.0043	0.008245	0.0491	0.0009	0.0049	0.009344
F-18	3	7	9	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0057	0.0006	0.0046	0.000052	0.0132	0.0013	0.0107	0.000121	0.0170	0.0017	0.0138	0.000156
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	315	341	374	0	300	0.75	10%	10%	20%	26.7%	45	12	0.1930	0.2051	6.3202	0.120777	0.2089	0.2220	6.8419	0.130746	0.2291	0.2435	7.5040	0.143398
T-1	21	32	35	0	240	1	10%	10%	20%	26.7%	60	16	0.0142	0.0234	0.0980	0.009860	0.0216	0.0357	0.1494	0.015025	0.0237	0.0390	0.1634	0.016434
A-10	6	8	9	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0037	0.0014	0.0238	0.005742	0.0050	0.0018	0.0317	0.007656	0.0056	0.0021	0.0357	0.008613
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	2	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0128	0.0052	0.0020	0.002691	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	0	10	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0189	0.0019	0.0153	0.000173
C-172	6	5	6	0	100	6	80%	20%	0%	100.0%	360	360	0.4955	0.0121	1.0931	0.000055	0.4129	0.0101	0.9109	0.000046	0.4955	0.0121	1.0931	0.000055
T-6	7	20	120	0	240	0.5	10%	10%	20%	26.7%	30	8	0.0007	0.0007	0.0037	0.000000	0.0020	0.0019	0.0106	0.000000	0.0118	0.0112	0.0633	0.000000
TOTAL													**0.7631**	**0.2492**	**7.5491**	**0.1463**	**0.7069**	**0.2736**	**7.9595**	**0.1618**	**0.8505**	**0.3124**	**8.8935**	**0.1782**

Aircraft Type	IR-124																							
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%															
F-16	53	23	31	0	450	0.5	10%	10%	20%	26.7%	30	8	0.1531	0.0029	0.0153	0.029133	0.0664	0.0012	0.0066	0.012642	0.0895	0.0017	0.0089	0.017040
F-18	1	3	3	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0019	0.0002	0.0015	0.000017	0.0057	0.0006	0.0046	0.000052	0.0057	0.0006	0.0046	0.000052
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-1	2350	2589	2610	0	240	1	10%	10%	20%	26.7%	60	16	1.5883	2.6203	10.9722	1.103435	1.7499	2.8868	12.0881	1.215656	1.7641	2.9102	12.1861	1.225517
A-10	4	5	6	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0025	0.0009	0.0159	0.003828	0.0031	0.0012	0.0198	0.004785	0.0037	0.0014	0.0238	0.005742
C-130	0	0	0	0	210	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	10	20	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0189	0.0019	0.0153	0.000173	0.0377	0.0037	0.0307	0.000346
C-172	7	5	6	0	100	6	80%	20%	0%	100.0%	360	360	0.5780	0.0141	1.2753	0.000064	0.4129	0.0101	0.9109	0.000046	0.4955	0.0121	1.0931	0.000055
T-6	0	2	4	0	240	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0002	0.0002	0.0011	0.000000	0.0004	0.0004	0.0021	0.000000
TOTAL													**2.3238**	**2.6384**	**12.2801**	**1.1365**	**2.2570**	**2.9018**	**13.0464**	**1.2334**	**2.3965**	**2.9300**	**13.3493**	**1.2488**

Aircraft Type	IR-139																						
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
F-16	4	10	11	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0116	0.0002	0.0012	0.002199	0.0289	0.0005	0.0029	0.005497	0.0318	0.0006	0.0032	0.006046
F-18	2	3	5	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0038	0.0004	0.0031	0.000035	0.0057	0.0006	0.0046	0.000052	0.0094	0.0009	0.0077	0.000087
B-1	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-2	0	0	0	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
B-52	0	0	0	0	350	0.6	10%	10%	20%	26.7%	36	9.6	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
T-43	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
AT-38	1	5	9	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0006	0.0007	0.0201	0.000383	0.0031	0.0033	0.1003	0.001917	0.0055	0.0059	0.1806	0.003451
T-1	0	0	0	0	240	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
A-10	4	7	9	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0025	0.0009	0.0159	0.003828	0.0044	0.0016	0.0278	0.006699	0.0056	0.0021	0.0357	0.008613
C-130	5	8	11	0	210	1	10%	10%	20%	26.7%	60	16	0.0186	0.0019	0.0109	0.009743	0.0298	0.0031	0.0174	0.015589	0.0409	0.0043	0.0239	0.021435
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-15	0	0	0	0	450	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
F-22	0	4	7	0	500	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0075	0.0007	0.0061	0.000069	0.0132	0.0013	0.0107	0.000121
C-172	2	2	2	0	100	6	80%	20%	0%	100.0%	360	360	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018
T-6	0	0	0	0	210	0.5	10%	10%	20%	26.7%	30	8	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
TOTAL													**0.2022**	**0.0081**	**0.4154**	**0.0162**	**0.2444**	**0.0139**	**0.5235**	**0.0298**	**0.2716**	**0.0191**	**0.6261**	**0.0398**

Aircraft Type	SR-128																						
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
T-1	5	6	10	0	240	1	10%	10%	20%	26.7%	60	16	0.0034	0.0056	0.0233	0.002348	0.0041	0.0067	0.0280	0.002817	0.0068	0.0112	0.0467	0.004695
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	35	45	45	0	210	1	10%	10%	20%	26.7%	60	16	0.1302	0.0136	0.0762	0.068201	0.1674	0.0175	0.0979	0.087688	0.1674	0.0175	0.0979	0.087688
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-12	0	0	0	0	0	0	0%	0%	0%	0.0%	0	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-172	2	2	2	0	100	6	80%	20%	0%	100.0%	360	360	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018
TOTAL													**0.2987**	**0.0232**	**0.4639**	**0.0706**	**0.3366**	**0.0283**	**0.4903**	**0.0905**	**0.3393**	**0.0327**	**0.5090**	**0.0924**

Aircraft Type	SR-270																						
	Baseline Annual Sorties (Pre-BRAC)	Proposed Annual Sorties (Post-BRAC)	Forecasted Annual Sorties	Flight Profile			Altitude Distribution (in Percent)			Minutes Below 3000 ft AGL			Baseline Emissions (tpy)				Proposed Emissions (tpy)				Forecasted Emissions (tpy)			
	Total	Total	Total	Typical/ Average Power Setting	Indicated Airspeed (knots)	Time Spent in Airspace Per Sortie (Hours)	500-1000 ft AGL	1000-2000 ft AGL	2000-5000 ft AGL	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
C-130 Example	967	967	967	65	165	0.5	5%	5%	10%	% Time Below 3000 ft	Total Time (mins)	Total Time Below 3000 ft	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}	NO_x	VOC	CO	PM_{10}
T-1	5	6	8	0	240	1	10%	10%	20%	26.7%	60	16	0.0034	0.0056	0.0233	0.002348	0.0041	0.0067	0.0280	0.002817	0.0054	0.0089	0.0374	0.003756
A-10	0	0	0	0	300	0.75	10%	10%	20%	26.7%	45	12	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-130	35	45	45	0	210	1	10%	10%	20%	26.7%	60	16	0.1302	0.0136	0.0762	0.068201	0.1674	0.0175	0.0979	0.087688	0.1674	0.0175	0.0979	0.087688
C-17	0	0	0	0	250	1	10%	10%	20%	26.7%	60	16	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-12	0	0	0	0	0	0	0%	0%	0%	0.0%	0	0	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000	0.0000	0.0000	0.0000	0.000000
C-172	2	2	2	0	100	6	80%	20%	0%	100.0%	360	360	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018	0.1652	0.0040	0.3644	0.000018
TOTAL													**0.2987**	**0.0232**	**0.4639**	**0.0706**	**0.3366**	**0.0283**	**0.4903**	**0.0905**	**0.3380**	**0.0305**	**0.4996**	**0.0915**

Aircraft	Engine	Fuel Flow (lb/hr)			
A-10	TF34-GE-100	Idle	App	Int	Mil
Number of Engines:	2	449	773	1,516	3,026

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
20.70	1.49	0.65	0.40	86.68	25.65	6.28	4.00	1.35	4.02	6.42	8.83	8.00	6.19	8.93	2.67

Aircraft	Engine	Fuel Flow (Kg/s)			
Alpha Jet	O-200	Idle	App	Climbout	Takeoff
Number of Engines:	1	0.0010	0.0032	0.0057	0.0057

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
29.000	33.200	20.800	20.800	644.000	1188.000	974.000	974.000	1.600	1.100	4.870	4.870	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (lb/hr)			
AT-38	J85-GE-5H	Idle	App	Int	Mil
Number of Engines:	2	506	1,071	2,155	2,815

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
15.34	3.04	0.64	0.52	158.22	93.67	28.38	28.98	2.11	2.86	5.67	4.66	4.70	1.79	1.13	1.13

Aircraft	Engine	Fuel Flow (lb/hr)			
B-1	F101-GE-102	Idle	App	Int	Mil
Number of Engines:	4	1,117	4,533	6,557	7,828

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
0.00	0.14	0.13	0.11	24.47	1.03	0.85	0.83	4.10	9.16	13.15	2.17	2.17	4.23	1.35	1.68

Aircraft	Engine	Fuel Flow (lb/hr)			
B-2	F118-GE-100	Idle	App	Int	Mil
Number of Engines:	4	1,097	3,773	6,350	10,887

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
0.59	0.87	0.00	0.00	20.98	2.02	0.84	0.65	4.30	11.09	18.01	33.12	1.25	4.47	1.78	1.64

Aircraft	Engine	Fuel Flow (lb/hr)			
B-52	TF33-P-3/103	Idle	App	Int	Mil
Number of Engines:	8	900	3,800	6,240	7,440

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
90.91	1.37	1.50	0.55	95.06	5.24	2.11	0.00	1.39	6.37	7.88	12.08	4.98	3.55	3.15	3.67

Aircraft	Engine	Fuel Flow (lb/hr)			
C-130	T56-A-9	Idle	App	Int	Mil
Number of Engines:	4	725	949	1,724	2,068

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
2.25	0.77	0.51	0.35	5.62	4.30	2.44	2.51	7.47	7.35	9.39	11.19	3.64	3.85	1.46	1.22

Aircraft	Engine	Fuel Flow (lb/hr)			
		T/O	C/O	App	Idle
C-17	F117-PW-100	13,976	10,919	4,279	1,104
Number of Engines:	4				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NOx Emission Index (lb/1000 lb)				PM10 Emission Index (lb/1000 lb)			
T/O	C/O	App	Idle	T/O	C/O	App	Idle	T/O	C/O	App	Idle	T/O	C/O	App	Idle
0.03	0.21	0.30	2.15	0.40	0.36	1.25	23.86	34.30	30.02	13.03	3.96	2.31	2.31	5.52	10.54

Aircraft	Engine	Fuel Flow (Kg/s)			
		Idle	App	Climbout	Takeoff
C-172	TSIO-360C	0.0015	0.0077	0.0125	0.0168
Number of Engines:	1				

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
138.000	11.000	9.500	9.170	592.000	995.000	961.000	1080.000	269.000	451.000	491.000	4.870	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (Kg/s)			
		Idle	App	Climbout	Takeoff
CH-146	PT6T-3D	0.0357	0.1533	0.2160	0.2371
Number of Engines:	2				

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
27.970	0.195	0.060	0.285	75.460	4.970	1.850	2.970	1.615	5.490	7.450	8.010	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (Kg/s)			
		Idle	App	Climbout	Takeoff
CH-47	T55-L712	0.0168	0.0630	0.0742	0.0890
Number of Engines:	2				

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
56.670	0.370	0.490	0.390	53.180	5.250	3.750	3.090	2.780	7.560	8.180	8.610	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
F-15C/E	F100-PW-220	1,084	3,837	5,770	9,679
Number of Engines:	2				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
7.94	5.12	2.89	1.79	35.30	1.92	0.86	0.86	4.61	12.53	22.18	29.32	2.06	2.63	2.06	1.33

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
F-16	F100-PW-200	1,016	3,135	5,406	8,717
Number of Engines:	1				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
8.28	0.26	0.22	0.13	26.61	1.38	0.49	0.86	4.99	13.82	27.60	39.12	2.06	2.63	2.06	1.33

Aircraft	Engine	Fuel Flow (Kg/s)			
		Idle	App	Climbout	Takeoff
F-18	F404-GE-400	0.0786	0.3270	0.7462	3.5780
Number of Engines:	2				

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
58.180	0.540	0.350	0.130	137.340	4.430	1.210	23.120	1.160	5.450	12.750	9.220	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
F-22	F119-PW-100	1,084	3,837	5,770	9,679
Number of Engines:	2				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
7.94	5.12	2.89	1.79	35.30	1.92	0.86	0.86	4.61	12.53	22.18	29.32	2.06	2.63	2.06	1.33

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
F-35/JSF	F119-PW-100	1,084	3,837	5,770	9,679
Number of Engines:	2				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
7.94	5.12	2.89	1.79	35.30	1.92	0.86	0.86	4.61	12.53	22.18	29.32	2.06	2.63	2.06	1.33

Aircraft	Engine	Fuel Flow (Kg/s)			
		Idle	App	Climbout	Takeoff
F-5	J85-GE-5H	0.0638	0.1349	0.2715	1.0250
Number of Engines:	2				

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
15.340	3.040	0.640	2.290	158.340	93.670	28.380	14.190	2.110	2.860	5.670	2.090	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
KC-10	F103-GE-101	1,706	5,238	15,675	19,738
Number of Engines:	3				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NOx Emission Index (lb/1000 lb)				PM10 Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
21.80	1.00	0.70	0.60	61.79	4.30	0.50	0.50	3.60	9.50	29.79	36.54	2.75	1.19	0.89	1.18

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
KC-135E	TF33-P-102	1,065	3,912	6,985	8,756
Number of Engines:	4				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
106.96	1.74	0.95	0.53	117.03	12.37	2.01	0.45	1.80	5.84	8.74	12.39	4.98	3.55	3.15	3.67

Aircraft	Engine	Fuel Flow (Kg/s)			
		Idle	App	Climbout	Takeoff
MH-47	T55-L712	0.0168	0.0630	0.0742	0.0890
Number of Engines:	2				

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
56.670	0.370	0.490	0.390	53.180	5.250	3.750	3.090	2.780	7.560	8.180	8.610	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (lb/hr)			
		Idle	App	Int	Mil
T-1	JT15D-5B	221	496	1,359	1,630
Number of Engines:	2				

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
79.60	8.43	0.70	0.10	108.14	35.30	1.63	0.20	2.15	5.11	9.67	11.30	4.98	3.55	3.15	2.52

Aircraft	Engine	Fuel Flow (Kg/s)			
T-43	JT8D-9A	Idle	App	Climbout	Takeoff
Number of Engines:	2	0.1323	0.2977	0.8453	1.0400

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
3.120	0.600	0.180	0.150	14.140	2.140	1.110	1.040	2.900	6.000	14.500	19.300	0.050	0.050	0.050	0.050

Aircraft	Engine	Fuel Flow (lb/hr)			
T-6	PT6A-68	Idle	App	Int	Mil
Number of Engines:	1	191	334	587	651

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
25.20	4.20	0.30	0.20	73.40	23.70	6.90	5.20	2.70	4.40	6.40	8.80	0.00	0.00	0.00	0.00

Aircraft	Engine	Fuel Flow (lb/hr)			
UAV	Rotax 914F	Idle	App	Int	Mil
Number of Engines:	1	0.0010	0.0032	0.0057	0.0057

VOC Emission Index (lb/1000 lb)				CO Emission Index (lb/1000 lb)				NO_x Emission Index (lb/1000 lb)				PM_{10} Emission Index (lb/1000 lb)			
Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil	Idle	App	Int	Mil
29.00	33.20	20.80	20.80	644.00	1188.00	974.00	974.00	1.60	1.10	4.87	4.87	0.05	0.05	0.05	0.05

Aircraft	Engine	Fuel Flow (Kg/s)			
UH-60	T700-GE-700	Idle	App	Climbout	Takeoff
Number of Engines:	2	0.0168	0.0630	0.0742	0.0890

VOC Emission Index (g/Kg)				CO Emission Index (g/Kg)				NO_x Emission Index (g/Kg)				PM_{10} Emission Index (g/Kg)			
Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff	Idle	App	Climbout	Takeoff
56.670	0.370	0.490	0.390	53.180	5.250	3.750	3.090	2.780	7.560	8.610	19.300	0.050	0.050	0.050	0.050

Notes:

Total emissions per aircraft sortie for a particular pollutant are totaled by adding emissions from each TIM cycle
Aircraft engine emissions for F-15 were used to calcuate emissions for the F-22 and F-35/JSF
Aircraft engine emissions for CH-53 were used to calcuate emissions for the CH-47 and MH-47
Aircraft engine emissions for UH-1 were used to calcuate emissions for the CH-146
Aircraft engine emissions for Cessna 150 were used to calcuate emissions for the UAV (assuming Raptor)
This action does not include flight operations in idle, climbout or takeoff modes. Only operation considered in this EA is approach mod

References:

USAF IERA 2001. US Air Force (USAF). *Air Emissions Inventory Guidance*, Table 3-3 for Criteria Pollutant Emission Factors for Aircraft Engines. July 2001
USEPA 2002. *Commercial Aircraft 2002*. Available online: <http://www.epa.state.oh.us/dapc/transfer/airport/CommercialAircraft2002.xls>. Accessed 2 October 2008

USEPA AirData Tier Report for Portions of Oklahoma and Texas That Fall Within Proposed Action's Airspace Operations

			Area Source Emissions						Point Source Emissions					
Row #	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	OK	Blaine Co	4,620	888	9,619	1,784	71.7	1,856	1,236	1,436	126	77.7	0.21	131
2	OK	Caddo Co	14,302	2,437	17,524	3,052	159	4,145	2,021	3,605	70.8	60.7	37.2	423
3	OK	Canadian Co	33,093	4,484	13,263	2,525	258	5,513	1,974	4,624	57.6	56.6	3.55	389
4	OK	Carter Co	18,091	2,949	9,189	1,609	190	4,231	1,741	2,506	606	483	506	850
5	OK	Cleveland Co	74,578	7,488	15,571	2,991	424	10,070	135	287	37.3	30.7	0.42	132
6	OK	Comanche Co	36,468	4,929	13,940	2,476	266	5,676	683	3,075	123	85.4	4.46	202
7	OK	Garvin Co	16,570	2,690	11,435	1,949	174	3,809	2,337	5,165	85	64.4	2,647	1,744
8	OK	Grady Co	23,691	3,554	18,923	3,319	207	5,493	1,780	2,518	2.17	2.16	203	1,049
9	OK	Greer Co	1,871	364	3,601	681	35.5	472	0	0	0	0	0	0
10	OK	Harmon Co	1,055	239	3,394	664	23.8	248	0	0	0	0	0	0
11	OK	Kiowa Co	4,492	1,025	8,025	1,498	97.6	1,260	0	0	10.9	3.65	0	15.8
12	OK	Love Co	7,904	1,224	5,518	965	74.4	1,206	0	0	0	0	0	0
13	OK	McClain Co	12,580	2,187	9,416	1,624	112	2,273	386	506	36.3	22.1	0	734
14	OK	Murray Co	5,575	943	3,454	630	52.6	902	0	0	56.9	30.4	0	4
15	OK	Pontotoc Co	13,193	2,014	10,688	1,834	141	2,456	635	3,732	326	311	979	271
16	OK	Pottawatomie Co	25,449	3,500	15,793	2,739	227	4,015	1,272	154	105	72.2	0.17	224
17	OK	Seminole Co	13,120	1,891	8,761	1,506	101	2,401	1,778	4,347	236	156	13	304
18	OK	Tillman Co	4,519	927	7,400	1,422	95.7	940	3.6	17.3	20.6	18.2	0.08	38.6
19	OK	Washita Co	7,438	1,354	10,038	1,871	96.1	2,443	375	409	0.08	0.08	0	48.5
1	TX	Archer Co	4,374	579	5,149	945	42.3	2,052	0	0	0	0	0	0
2	TX	Baylor Co	2,363	328	2,542	568	35	824	0	0	0	0	0	0
3	TX	Blanco Co	4,413	497	3,464	633	29.5	619	0	0	0	0	0	0
4	TX	Bosque Co	7,041	1,448	6,947	1,244	92	1,328	351	851	406	153	576	5.22
5	TX	Brown Co	11,817	1,762	9,108	1,614	115	2,983	100	134	32.6	23.6	1.58	582
6	TX	Callahan Co	9,957	1,591	5,317	998	82.3	1,667	123	176	1.11	1.11	0.06	27.1
7	TX	Clay Co	5,061	1,236	5,019	964	110	1,558	54.5	295	3.67	3.56	0	66.1
8	TX	Coke Co	3,020	223	2,487	491	16.3	720	431	1,444	29.5	28.9	463	225
9	TX	Coleman Co	4,081	794	3,487	751	62	1,308	20.7	83.3	0	0	0.5	4.92
10	TX	Collin Co	119,942	14,259	37,589	7,482	832	13,762	1,384	975	56.1	55.4	852	429
11	TX	Comanche Co	5,018	757	5,968	1,049	57.6	1,132	0	0	0	0	0	0
12	TX	Concho Co	2,345	358	3,413	687	35.3	605	0	0	0	0	0	0
13	TX	Cooke Co	14,071	2,408	9,637	1,702	148	3,106	0.15	0.36	0.93	0.67	0	58.6
14	TX	Coryell Co	12,936	1,849	7,364	1,330	142	2,598	0	0	4.48	2.95	0	39.7
15	TX	Crockett Co	14,033	1,680	1,469	611	93.3	3,984	1,639	3,221	22.7	22.6	612	399
16	TX	Delta Co	2,341	341	3,230	577	22.7	432	0	0	0	0	0	0
17	TX	Denton Co	121,036	15,092	29,907	5,658	614	14,718	370	316	192	139	31	678
18	TX	Eastland Co	13,231	2,344	5,554	1,041	127	2,278	170	510	17.8	16	0.76	248
19	TX	Edwards Co	3,909	270	1,825	516	381	552	23.8	15.5	0.03	0.03	0	7.15
20	TX	Erath Co	10,381	1,345	7,089	1,259	87.1	2,127	0.27	0.47	4.31	2.79	0.04	30.4
21	TX	Fannin Co	11,023	1,665	10,821	1,917	117	2,091	1,054	3,179	98.5	96.9	60.8	84.5
22	TX	Foard Co	1,324	196	3,830	787	17.7	341	0	0	0	0	0	0
23	TX	Gillespie Co	8,917	1,079	5,918	1,078	64.4	1,210	0	0	0	0	0	0
24	TX	Grayson Co	45,346	5,791	20,594	3,654	325	7,561	430	574	52.3	29.7	7.72	55.1
25	TX	Hamilton Co	2,851	433	4,024	743	36.8	630	0	0	0	0	0	0
26	TX	Hardeman Co	1,862	811	3,205	685	63.5	606	78.6	96.3	2.18	0.92	0.41	26.3
27	TX	Hill Co	18,700	3,649	11,700	2,079	210	3,130	0	0	20.4	14.5	0	90.6
28	TX	Hood Co	12,085	1,513	12,116	2,073	87.5	2,109	1,349	6,966	147	144	69.5	114
29	TX	Hopkins Co	14,878	1,988	8,540	1,548	114	2,515	229	349	4.67	4.43	2,514	36.9
30	TX	Hunt Co	29,956	4,078	17,619	3,034	241	4,996	17.6	34	2.07	1.8	3.45	11.7
31	TX	Irion Co	1,538	131	1,322	300	16.1	729	380	904	0.55	0.53	98.8	134
32	TX	Jack Co	2,407	282	2,636	523	25.5	1,446	531	818	6.99	6.78	0.11	280
33	TX	Jackson Co	6,006	1,205	6,664	1,310	114	2,278	299	2,562	22.2	21.7	2.48	263
34	TX	Johnson Co	46,019	6,793	25,741	4,412	382	6,611	465	2,231	478	346	53.2	154
35	TX	Kaufman Co	29,871	4,120	16,344	2,844	223	5,301	19	166	2.59	2.47	0.08	175
36	TX	Kerr Co	22,083	2,448	9,693	1,720	132	2,793	0	0	0	0	0	0
37	TX	Kimble Co	11,264	1,411	1,456	360	56.8	1,002	102	23.3	27.5	23.4	0.54	6.88
38	TX	Lampasas Co	5,731	1,211	4,456	809	81.8	961	0	0	0	0	0	0
39	TX	Llano Co	4,753	345	3,502	692	26.9	976	139	889	43	39.8	3.07	35.8
40	TX	Mason Co	2,196	182	2,466	481	16.7	340	0	0	0	0	0	0
41	TX	McCulloch Co	3,396	396	2,757	575	37	793	0	0	0	0	0	0
42	TX	McLennan Co	68,860	8,642	23,815	4,447	486	11,789	2,209	15,966	521	505	1,362	268
43	TX	Menard Co	1,678	126	1,739	366	13.5	265	0	0	0	0	0	0
44	TX	Mills Co	2,646	565	3,191	585	37.8	480	0	0	0	0	0	0
45	TX	Mitchell Co	9,214	1,387	4,840	979	69.7	1,786	1,024	7,435	110	108	82	89.1
46	TX	Montague Co	5,940	1,541	6,056	1,084	105	1,677	14.7	105	1.47	1.47	0	30.4
47	TX	Nolan Co	11,491	2,013	5,397	1,073	121	1,842	402	2,801	371	215	171	129
48	TX	Palo Pinto Co	11,545	1,623	6,010	1,123	99.7	2,478	962	2,071	57.6	57.6	4.78	358
49	TX	Parker Co	37,229	5,403	24,675	4,264	279	5,227	488	893	81.8	62.7	159	285
50	TX	Pecos Co	28,595	3,896	4,563	1,165	177	9,236	4,368	8,953	98.5	96.3	4,227	5,640
51	TX	Rains Co	4,553	577	3,818	684	33.3	1,022	64.6	43.2	0.08	0.08	0.01	13.5
52	TX	Reagan Co	2,123	169	1,584	389	23.8	1,403	1,853	3,437	20.3	19.5	4,478	135
53	TX	Runnels Co	3,967	643	6,671	1,341	62.1	1,375	10.5	7.21	0.01	0.01	52	35.6
54	TX	San Saba Co	2,910	291	2,837	579	27.4	531	0	0	0	0	0	0
55	TX	Schleicher Co	2,512	206	2,334	501	21.4	725	96.9	334	0.04	0.04	1.51	87.5
56	TX	Somervell Co	2,600	308	2,975	504	18.3	503	0	0	0	0	0	0
57	TX	Stephens Co	3,271	542	2,591	532	42.3	1,057	51.8	115	0.06	0.06	0.21	71.4
58	TX	Sterling Co	1,568	127	1,349	321	16.5	695	591	776	0.43	0.42	27.5	159
59	TX	Sutton Co	13,397	1,732	1,471	488	82.8	2,397	964	2,310	2.93	2.9	3.51	464
60	TX	Terrell Co	2,390	851	1,234	358	62.3	944	1,478	1,686	15.9	15.1	0	1,189
61	TX	Tom Green Co	29,137	3,108	11,425	2,217	258	5,866	289	668	37.3	37.3	2.98	27
62	TX	Upton Co	2,871	240	2,905	586	25.9	1,241	1,859	3,826	28.1	26.7	23.9	908
63	TX	Val Verde Co	14,146	1,905	3,649	912	152	2,726	0	0	0	0	0	0
64	TX	Van Zandt Co	17,446	2,629	14,957	2,573	149	3,043	356	459	2.85	2.59	0.22	87
65	TX	Wichita Co	33,997	4,007	6,786	1,414	263	8,294	256	6,947	662	640	603	1,732
66	TX	Wilbarger Co	5,078	1,235	5,452	1,146	99.6	1,695	638	6,285	774	570	3,972	102
67	TX	Wise Co	13,501	2,431	13,270	2,382	166	4,090	1,793	3,884	203	101	0.35	645
68	TX	Young Co	6,602	763	4,890	946	63.2	2,392	749	3,387	55.4	54.8	1,288	696
Total			**1,311,452**	**180,935**	**698,005**	**129,842**	**11,275**	**240,960**	**46,635**	**131,583**	**6,623**	**5,173**	**26,204**	**23,979**

SOURCE:
USEPA - AirData NET Tier Report
http://www.epa.gov/air/data/geosel.html
Site visited on 7 October 2008
*Net Air pollution sources (area and point) in tons per year (2001
Site visited on 13 May 2008.

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