DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)
PROPOSED UTILIZATION OF MILITARY TRAINING ROUTE INSTRUMENT ROUTE-177 AT ALTUS AIR FORCE BASE, OKLAHOMA

Pursuant to provisions of the *National Environmental Policy Act* (NEPA), Title 42 *United States Code* Section 4321 et seq., implemented by Council on Environmental Quality (CEQ) regulations at Title 40, Code of Federal Regulations (CFR) Parts 1500–1508, and 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*, the Department of the Air Force (DAF) prepared the attached Environment Assessment (EA) to address the potential environmental impacts on the human environment, including the natural environment, associated with proposed utilization of Military Training Route (MTR) Instrument Route (IR)-177 at Altus Air Force Base.

Purpose and Need

The purpose of the Proposed Action is to enable efficient C-17 sortie flow from an aerial refueling event to a low-level event for Altus Air Force Base (AFB) aircraft, de-conflict training with other Altus AFB-managed MTRs, and allow for concurrent training throughout Altus AFB-managed airspace.

The Proposed Action is needed to accomplish the following objectives:

- Provide Aircrews with access to low-level tactical ingress and egress, night-vision goggle operation, defensive maneuvering, simulated landing zone operation, and varied terrain and weather condition training scenarios.
- Reduce impacts on flying training incurred by inclement weather conditions.
- Provide Altus AFB with high-altitude descent planning into objective areas.
- Improve low-level formation flight training capabilities.
- Achieve higher fuel savings during training operations.
- Increase flying training access to mountainous terrain.

Description of Proposed Action and Alternatives

The DAF is requesting the utilization of IR-177 and standardization of the floor altitude for C-17 training out of Altus AFB to enable efficient C-17 sortie flow from an aerial refueling event to a low-level event for Altus AFB aircraft. IR-177 is an established MTR that was previously managed by Dyess AFB and used by B-1 aircraft but is not currently used. Utilization of IR-177 would allow training de-confliction with other Altus AFB-managed MTRs and allow for more concurrent training throughout Altus AFB-managed airspace. Under the Proposed Action, only the center linear portion of the legacy IR-177 would be retained and used. The **Preferred Alternative (Alternative 3)** would modify the legacy MTR to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre National Historic Site (NHS) while avoiding Eads Municipal Airport by 3 nautical miles (nm). This alternative would add two points to this MTR segment and allow 4 nm on either side of the centerline, which would maintain the route structure and grant aircraft operating in IR-177 increased capability to navigate around the Sand Creek Massacre NHS while retaining navigable training operations. DAF would request that FAA chart IR-177 in accordance with the Preferred Alternative.

Alternative 1

Alternative 1 would lower and standardize the floor elevation of IR-177 at 300 feet above ground level (AGL), and the MTR would remain in its current linear configuration except that the sections of the legacy MTR over New Mexico, Texas, and the majority of Oklahoma would remain inactive. Under Alternative 1, portions of IR-177 would be repurposed and renamed. The number of proposed flight operations per year is shown in **Table 1**.

Table 1
Proposed Annual Training Activities within the IR-177 MTR

Activity	Aircraft Type	Day Operations	Night Operations	Total Annual Operations
97th Air Mobility Wing	C-17	566	134	700
140th Wing	F-16C	8	2	10
Transient	Fighters	36	4	40
Transient	Other	64	6	70
Total Activities		**674**	**146**	**820**

Alternative 2

Alternative 2 would differ from Alternative 1 in that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1. The sections of the legacy MTR over New Mexico, Texas, and the majority of Oklahoma would remain inactive.

Alternative 3 (Preferred Alternative)

Alternative 3 would be similar to Alternative 1; however, Alternative 3 would modify the legacy MTR to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre NHS while avoiding Eads Municipal Airport by 3 nm. This alternative would add two points to this MTR segment and allow 4 nm on either side of the centerline, which would maintain the route structure and grant aircraft operating in IR-177 increased capability to navigate around the Sand Creek Massacre NHS while retaining navigable training operations. The sections of the legacy MTR over New Mexico, Texas, and the majority of Oklahoma would remain inactive.

No Action Alternative

Under the No Action Alternative, utilization and standardization of the floor of IR-177 would not occur. Altus AFB C-17 pilot training would remain limited in MTR availability needed to offset the effects of inclement weather, practice high-altitude descents, perform terrain masking tactics in mountainous areas, and fly formation flight tactics at low level.

Under the No Action Alternative, Altus AFB would continue to use MTRs in the same geographic region. Poor weather conditions within the existing MTRs would continue to cause cancellation of Altus AFB training missions because no alternate training route is available. Further, training in existing MTRs provides limited vertical terrain features, denying pilots the experience of training in varied terrain.

Summary of Findings

Potentially affected environmental resources were identified through communications with state and federal agencies and review of environmental documentation. The attached EA analyzes potential environmental consequences of the following resource areas: airspace management, air quality (including climate change and greenhouse gas), operational noise, cultural resources, biological resources, land use, socioeconomics, environmental justice and protection of children, and safety and occupational health.

Airspace Management

Under **Alternative 1,** there would be no significant, adverse impacts to airspace management. Short-term impacts could occur when the MTR is active, and Alternative 1 has the potential to affect instrument approach procedures at various airports in the vicinity of the route. Potential impacts to civil traffic and the surrounding airports and airspace would only occur when the MTR is active. There would be no new impacts in the established Cougar Military Operations Area (MOA) and Two Buttes MOA, and existing exclusions within those MOAs would remain in place. Impacts to scheduling and management of existing instrument

routes and MOAs would be handled internally among the DAF agencies and impacts are not anticipated. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Air Quality (including Greenhouse Gas and Climate Change)

Under **Alternative 1,** there would be long-term, minor, adverse impacts to air quality. Emissions resulting from the Proposed Action would remain below the applicable thresholds for air quality standards. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Operational Noise

Under **Alternative 1**, noise levels would not exceed applicable thresholds and there would be no impacts to noise-sensitive receptors; therefore, there would be no long-term, adverse impacts to noise. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Cultural Resources

Under **Alternative 1**, there would be no adverse effects to historic architectural properties, archaeological sites, historic district resources, and Traditional Cultural Properties. Flight operations would be conducted in a way to prevent visual impacts and noise impacts to the Sand Creek Massacre NHS avoidance area. Only a portion of the Amache NHS is located within the APE, and Altus AFB would be able to avoid flying directly over the site without negatively impacting training operations. Internal special operating procedures would identify the Amache NHS for avoidance. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Biological/Natural Resources

Alternative 1 would have no effect to the black-footed ferret, gray wolf, New Mexico meadow jumping mouse, or the monarch butterfly. Alternative 1 may affect, but is not likely to adversely affect, the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, and tricolored bat, all of which may travel through the IR-77 MTR area. There would be minor, adverse impacts to migratory birds due to air strike hazards, and no impacts to vegetation, aquatic resources, or invasive species. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Land Use

Under **Alternative 1**, there would be no change to the current land use underneath the IR-77 MTR except for the insignificant impacts on the ability to site new wind farms in the areas below where the MTR would be utilized. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Socioeconomics

Under **Alternative 1**, there would be no impacts to socioeconomic resources. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Environmental Justice and the Protection of Children

Under **Alternative 1**, there would be no impacts to communities of environmental justice concern or youth populations. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1.**

Safety and Occupational Health

Under **Alternative 1,** there would be long-term, minor, adverse impacts to ground and flight safety due to flight training operations occurring in the newly utilized MTR. Implementation of **Alternatives 2** and **3** would be anticipated to have the same impacts as **Alternative 1**

Cumulative Impacts

The Draft EA considered cumulative impacts, which are effects on the environment that result from the incremental effects of the Proposed Action or Alternatives when added to the effects of other past, present, and reasonably foreseeable actions, regardless of what agency or person undertakes such other actions. The previously completed Cougar MOA modification, as well as the proposed Cannon AFB IR 320, 500, and 501 utilization projects were reviewed in conjunction with the Altus AFB IR-177 utilization action. Due to the geographical proximity of the Cougar MOA to IR-177 and the overlap of IR-501 with IR-177, these airspace actions have the greatest potential to result in cumulative environmental impacts. All environmental resource areas described above were evaluated in the context of these related actions. When considered in conjunction with the incremental effects of past, present, and reasonably foreseeable actions within the region, no significant cumulative impacts would be anticipated to occur with implementation of the Proposed Action.

Mitigation

The EA analysis concluded that the Proposed Action and Alternatives would not result in significant environmental impacts. Alternatives have been proposed in a way to avoid sensitive resources wherever possible. Measures for avoidance of environmental impact include:

- The 140 WG would suspend flights over the Sand Creek Massacre NHS during tribal ceremonies with advance notice of the date, time, and location of such ceremonies;
- The 140 WG would restrict flights below 5,000 feet AGL within a 5 nm radius of the Sand Creek Massacre NHS marker, and no flights over the site would be armed.
- Internal special operating procedures would identify the Amache NHS site for avoidance.

Best management practices are described and recommended in the EA where applicable.

Conclusion

Finding of No Significant Impact. After review of the attached EA prepared in accordance with the requirements of NEPA, CEQ regulations, and 32 CFR Part 989, and which is hereby incorporated by reference, I have determined that the Proposed Action would not have a significant impact on the quality of the human environment, including the natural environment. Accordingly, an Environmental Impact Statement will not be prepared.

_____ _____

BIRJU H. PATEL, Major DATE
USAF Chief
AETC/A4PC Engineer Requirement

Draft
Environmental Assessment for Utilization of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

October 2024

Prepared for:
Department of the Air Force
Air Education and Training Command
97th Air Mobility Wing
Altus Air Force Base, Oklahoma

PRIVACY ADVISORY

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

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

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment period. If you have difficulty accessing the document electronically, please contact Heath Sirmons via email: jimmy.sirmons@us.af.mil or phone: 580-481-7609. Only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

COMPLIANCE

This document has been certified that it does not exceed 75 pages, not including appendices, as defined in 40 CFR § 1501.5(g). As defined in 40 CFR § 1508.1(bb), a "page" means 500 words and does not include maps, diagrams, graphs, tables, and other means of graphically displaying quantitative or geospatial information.

ACCESSIBILITY NOTICE

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

COVER SHEET
Draft Environmental Assessment for
Utilization of Military Training Route Instrument Route-177
Altus Air Force Base, Oklahoma

a. *Responsible Agency: Department of the Air Force*

b. *Location: Altus Air Force Base, Oklahoma*

c. *Designation: Draft Environmental Assessment*

d. *Point of Contact:* Mr. Heath Sirmons, Chief, 97 CES/CEIE, 401 L Avenue, Altus Air Force Base, OK 73523, jimmy.sirmons@us.af.mil

Abstract:

This Environmental Assessment has been prepared pursuant to provisions of the *National Environmental Policy Act*, Title 42 *United States Code* § 4321 et seq., implemented by Council on Environmental Quality Regulations at Title 40, *Code of Federal Regulations* (CFR) Parts 1500–1508, and 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*. Potentially affected environmental resources were identified in coordination with local, state, and federal agencies. Specific environmental resources with the potential for environmental consequences include airspace management, air quality and climate change; operational noise, cultural resources, biological and natural resources, land use, socioeconomics, environmental justice, and safety and occupational health.

The purpose of the Proposed Action is to enable efficient C-17 sortie flow from an aerial refueling event to a low-level event for Altus Air Force Base (AFB) aircraft, de-conflict training with other Altus AFB-managed Military Training Routes (MTRs), and allow for concurrent training throughout Altus AFB-managed airspace.

The Proposed Action is needed to provide Aircrews with access to low-level tactical ingress and egress, night-vision goggle operation, defensive maneuvering, simulated landing zone operation, and varied terrain and weather condition training scenarios. The Proposed Action is also needed to reduce impacts on flying training incurred by inclement weather conditions, provide Altus AFB with high-altitude descent planning into objective areas, improve low-level formation flight training capabilities, achieve higher fuel savings during training operations, and increase flying training access to mountainous terrain.

The analysis of the affected environment and environmental consequences of implementing the Proposed Action concluded that by implementing standing environmental protection measures and best management practices, there would be no significant adverse impacts from the actions at Altus AFB or IR-177 on the environmental resources. Impacts associated with the action would be minor, and significant cumulative impacts are not anticipated with implementation of the Proposed Action when considered in conjunction with past, present, and reasonably foreseeable environmental actions near the IR-177 MTR.

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ACRONYMS AND ABBREVIATIONS

140 WG	140th Wing
97 AMW	97th Air Mobility Wing
ACAM	Air Conformity Applicability Model
AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AFREP	Air Force Representative to the Federal Aviation Administration
AGL	above ground level
AHAS	Avian Hazard Advisory System
ANG	Air National Guard
ANSI	American National Standards Institute
AOPA	Aircraft Owners and Pilots Association
APE	Area of Potential Effects
AR	air refueling
ARTCC	Air Route Traffic Control Center
ATCAA	Air Traffic Controlled Assigned Airspace
BAM	Bird Avoidance Model
BASH	Bird/Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act of 1940
CAA	Clean Air Act
CEJC	community with environmental justice concerns
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPW	Colorado Department of Parks and Wildlife
DAF	Department of the Air Force
DAFI	Department of the Air Force Instruction
dB	decibel
DNL	Day-Night Average Sound Level
DoD	United States Department of Defense
DoDI	Department of Defense Instruction
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FIR	Flight Information Region
FONSI	Finding of No Significant Impact
FY	fiscal year
GHG	greenhouse gas
Hz	Hertz
IPaC	Information for Planning and Consultation
IR	instrument route
KDWP	Kansas Department of Wildlife and Parks
KHSAI	Kansas Historical Society Archaeological Inventory
MAJCOM	major command
MBTA	Migratory Bird Treaty Act
MOA	Military Operation Area
MSL	mean sea level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act

NHPA	National Historic Preservation Act
NHS	National Historic Site
nm	nautical miles
NOTAM	Notice to Air Missions
NPS	National Park Service
NRHP	National Register of Historic Places
PSD	Prevention of Significant Deterioration
ROI	Region of Influence
SAF/IEIM	Assistant Secretary of the Air Force Mission Sustainment
SC-CO_2	social cost of carbon dioxide
SC-GHG	social cost of greenhouse gas
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office
SIP	state implementation plan
SUA	Special-Use Airspace
SWAP	Colorado State Wildlife Action Plan
THPO	Tribal Historic Preservation Office
TCP	Traditional Cultural Property
US	United States
USC	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VFR	visual flight rules
VOC	volatile organic compound
WPA	Works Progress Administration

CHAPTER 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION AND BACKGROUND

The Department of the Air Force (DAF), Air Education and Training Command (AETC), prepared this Environmental Assessment (EA) in compliance with the *National Environmental Policy Act of 1969* (42 *United States Code* [USC] § 4321 et seq.) (NEPA); the Council on Environmental Quality (CEQ) NEPA implementing procedures (40 *Code of Federal Regulations* [CFR] Parts 1500–1508 [1]); and the DAF's regulations at 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*.

THE MILITARY TRAINING ROUTE (MTR) PROGRAM WAS CONCEIVED TO ENSURE THE GREATEST PRACTICAL LEVEL OF SAFETY FOR ALL FLIGHT OPERATIONS. THE MTR PROGRAM IS A JOINT VENTURE OF THE FEDERAL AVIATION ADMINISTRATION AND THE DEPARTMENT OF DEFENSE.

MTRS ARE MUTUALLY DEVELOPED FOR USE BY THE MILITARY FOR THE PURPOSE OF CONDUCTING LOW-ALTITUDE, HIGH-SPEED TRAINING. THE ROUTES HIGHER THAN 1,500 FEET ABOVE GROUND LEVEL (AGL) ARE DEVELOPED TO BE FLOWN, TO THE MAXIMUM EXTENT POSSIBLE, UNDER INSTRUMENT FLIGHT RULES. THE ROUTES AT 1,500 FEET AGL AND BELOW ARE GENERALLY DEVELOPED TO BE FLOWN UNDER VISUAL FLIGHT RULES.

The information presented in this EA serves as the basis for deciding whether the Proposed Action or Alternatives would result in a significant impact to the human or natural environment, requiring the preparation of an Environmental Impact Statement (EIS), or whether no significant impacts would occur, in which case a Finding of No Significant Impact (FONSI) would be prepared.

The 97th Air Mobility Wing (97 AMW) at Altus Air Force Base (AFB), Oklahoma, is requesting a reconfiguration from the Federal Aviation Administration (FAA) for Military Training Route (MTR) Instrument Route (IR)-177 for C-17 aircraft training, as the DAF does not have the authority to reconfigure airspace on its own. Altus AFB is requesting the reconfiguration of IR-177 to use only portions of the MTR that align with current and future training requirements. Portions of the previously utilized, or "legacy"[2] IR-177 (as it will be referred to within this EA), that would not be utilized for training would remain inactive. IR-177 is an established MTR that was previously managed by Dyess AFB, Texas, for B-1 bomber aircraft training but is currently inactive. The DAF's Proposed Action also includes standardization of the floor altitude of this remaining route to 300 feet above ground level (AGL) to align with current and future training requirements.

1.2 LOCATION

1.2.1 Altus AFB

THE C-17 GLOBEMASTER III IS A LARGE MILITARY TRANSPORT AIRCRAFT THAT WAS DEVELOPED FOR THE AIR FORCE FROM THE 1980S TO THE EARLY 1990S. THE C-17 IS A HIGH-WING, FOUR-ENGINE, T-TAILED MILITARY TRANSPORT AIRCRAFT THAT CAN CARRY LARGE EQUIPMENT, SUPPLIES, AND TROOPS DIRECTLY TO SMALL AIRFIELDS IN HARSH TERRAIN ANYWHERE IN THE WORLD.

Altus AFB is located in Jackson County in southwestern Oklahoma, approximately 4 miles east-northeast of the city of Altus and 140 miles southwest of Oklahoma City (**Figure 1-1**). The host unit at Altus AFB is the 97 AMW assigned to the Nineteenth Air Force of the AETC. The 97 AMW serves as the DAF's Combat Mobility and Expeditionary Training Center for Excellence. Altus AFB's mission is to train exceptional mobility Airmen. The 97 AMW provides global mobility by expertly training airlift and aerial refueling Aircrews to achieve global reach and power while simultaneously maintaining worldwide deployment capabilities. Altus AFB is home to the DAF's only formal training unit for the C-17 Globemaster III, KC-135 Stratotanker, and KC-46 Pegasus.

[1] This EA is following the 1 May 2024 update to the CEQ rules, which became effective 1 July 2024 (see Volume 89 *Federal Register*, page 35442–35576).

[2] The term "legacy" refers to the fact that this route had existed for decades and was used by the Colorado Air National Guard but has been inactive. If the Proposed Action or Alternative is implemented, IR-177 would be actively managed and primarily used by the 97 AMW from Altus AFB.

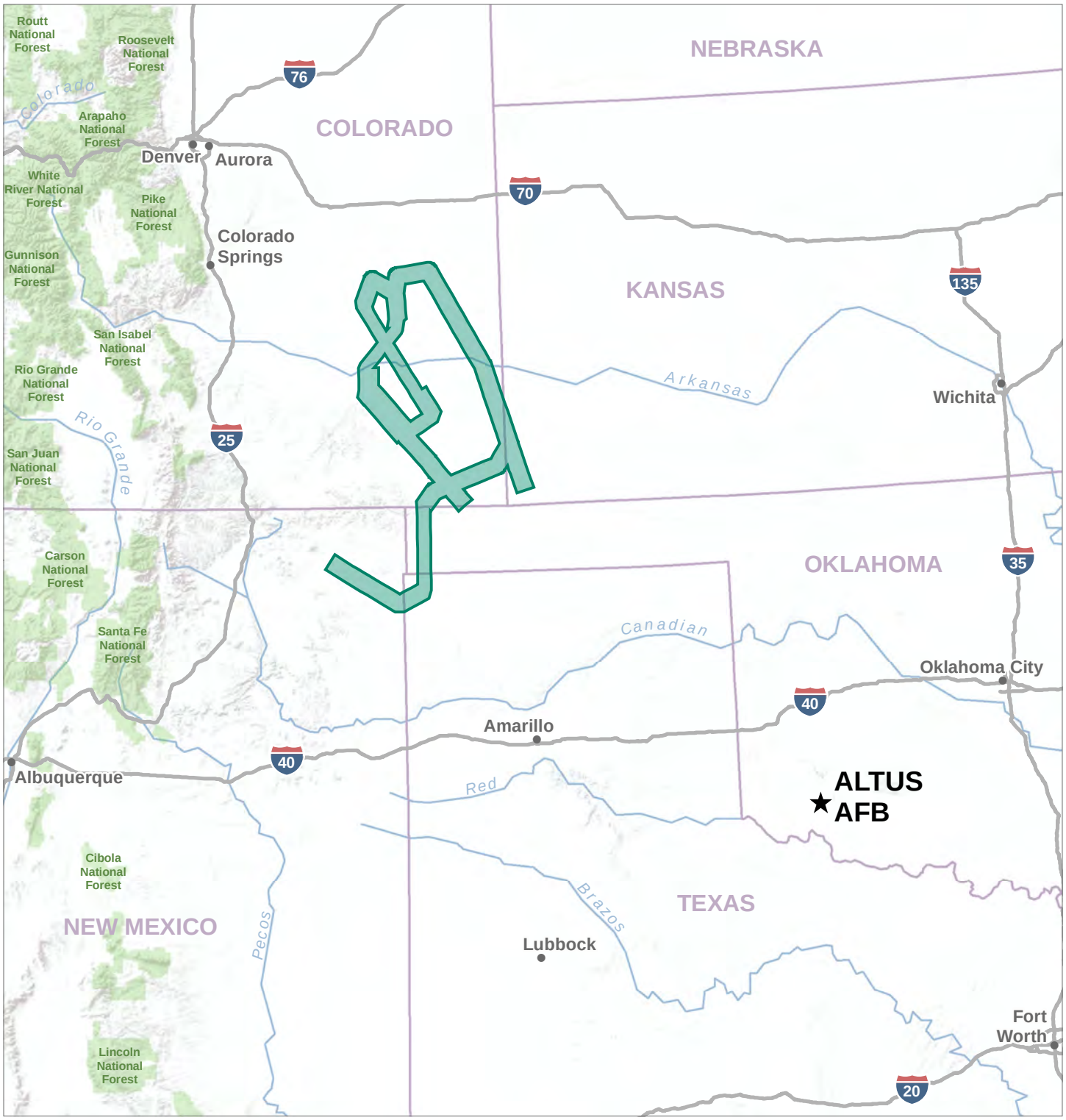


FIGURE 1-1
Altus AFB and IR-177 Vicinity

IR-177 Existing Airspace

N

0 100 Miles

Coordinate System: NAD 83 UTM Zone 13N

1.2.2 IR-177 Military Training Route

The IR-177 MTR is geographically separated from Altus AFB and is approximately 227 miles northwest of the Base. The IR-177 MTR covers approximately 7,381 square miles and is located in southeastern Colorado, southwestern Kansas, northwestern Oklahoma, northwestern Texas, and northeastern New Mexico (see **Figure 1-1**). **Figure 1-2** shows the legacy IR-177 MTR in relation to major landmarks: the Sand Creek Massacre National Historic Site (NHS), the cities of Lamar and La Junta, Interstate 395, and US Routes 287 and 160 in Colorado; the city of Ulysses and US Routes 56 and 160 in Kansas; US Route 56 in Oklahoma; the city of Dalhart and US Routes 385 and 87 in Texas; and US Routes 87 and 56 in New Mexico. IR-177 crosses the Arkansas River in Colorado and Kansas. Further, IR-177 is within 50 miles of more than 200 mountain peaks ranging from 3,888 to 9,012 feet in elevation.

1.2.3 Military Operations Areas Within and Near the IR-177 MTR

The legacy IR-177 conflicts with and is routed through three existing Military Operations Areas (MOAs): Cougar, Two Buttes, and Mt. Dora North. The proposed IR-177 would continue to route through the Cougar and Two Buttes MOAs. A brief description of these three MOAs is provided below. The MOAs would not be modified as part of the Proposed Action.

A MILITARY OPERATIONS AREA (MOA) IS A TYPE OF SPECIAL-USE AIRSPACE TO SEPARATE OR SEGREGATE (VERTICALLY AND/OR LATERALLY) CERTAIN NONHAZARDOUS MILITARY ACTIVITIES FROM TRAFFIC OPERATING UNDER INSTRUMENT FLIGHT RULES. ACTIVITIES IN MOAS INCLUDE, BUT ARE NOT LIMITED TO, AIR COMBAT MANEUVERS, AIR INTERCEPTS, AND LOW-ALTITUDE TACTICS. THE DEFINED VERTICAL AND LATERAL LIMITS VARY FOR EACH MOA.

The Cougar MOA is located approximately 267 nautical miles (nm) northwest of Altus AFB and is solely within the Denver Air Route Traffic Control Center (ARTCC) Flight Information Region (FIR). Denver ARTCC has airspace jurisdiction and is the controlling agency for the Cougar MOA. The Cougar MOA is subdivided into the Cougar Low MOA and Cougar High MOA. The Cougar Low MOA is the airspace from 500 feet AGL up to, but not including, 11,000 feet mean sea level (MSL). The Cougar Low MOA excludes airspace 1,500 feet AGL and below within 3 nm surrounding the Windy Plains, Eads, and Tribune airports. Additionally, the Cougar Low MOA excludes the airspace 5,000 feet AGL and below within 5 nm of the Sand Creek Massacre NHS. The Cougar High MOA is located on top of the Cougar Low MOA within the airspace from 11,000 feet MSL up to, but not including, 18,000 feet MSL. The using agency of the Cougar MOAs is the Air National Guard (ANG), 140th Wing at Buckley AFB, Colorado. Within the 140th Wing is the 120th Fighter Squadron, which has operational control and responsibility for the F-16 training mission within the 140th Wing. The 140th Wing flies 5,500 hours and 2,500 sorties annually, distributed among many different Special-Use Airspaces (SUAs) to meet mission objectives. The Cougar MOA times of use during the daytime hours are 0700 to 2200 local time, Tuesday through Friday, with other days approved by Notice to Air Missions (NOTAM) except during nighttime hours between 2200 and 0700 local time.

WHEN FLYING OVER LAND, THE FEDERAL AVIATION ADMINISTRATION USES "ABOVE GROUND LEVEL" (AGL) AND "MEAN SEA LEVEL" (MSL) TO DELINEATE AIRSPACE STRUCTURE. AGL IS ALTITUDE IN FEET MEASURED ABOVE THE SURFACE OF THE GROUND AND IS USED TO DESCRIBE THE FLOOR OF THE AIRSPACE. MSL IS ALTITUDE IN FEET MEASURED ABOVE THE AVERAGE SEA LEVEL AND IS USED TO DESCRIBE THE CEILING OF THE AIRSPACE.

The Two Buttes MOA is located approximately 244 nm northwest of Altus AFB. The Two Buttes MOA is also solely located within the Denver ARTCC FIR; Denver ARTCC has airspace jurisdiction and is the controlling agency for the Two Buttes MOA. The Two Buttes MOA is subdivided into a Two Buttes Low MOA and Two Buttes High MOA. The Two Buttes Low MOA is the airspace from 300 feet AGL up to, but not including, 10,000 feet MSL. The Two Buttes High MOA is located above the Two Buttes Low MOA in the airspace beginning at 10,000 feet MSL up to, but not including, 18,000 feet MSL. As with Cougar MOA, the ANG, 140th Wing at Buckley AFB, Colorado, is the using agency of the Two Buttes MOA. Times of use for Two Buttes High MOA are sunrise to sunset, Tuesday through Saturday, with other days approved by NOTAM except during nighttime hours between 2200 and 0700 local time. The Two Buttes Low MOA is activated intermittently during daytime hours (0700 through 2200 local time) by NOTAM.

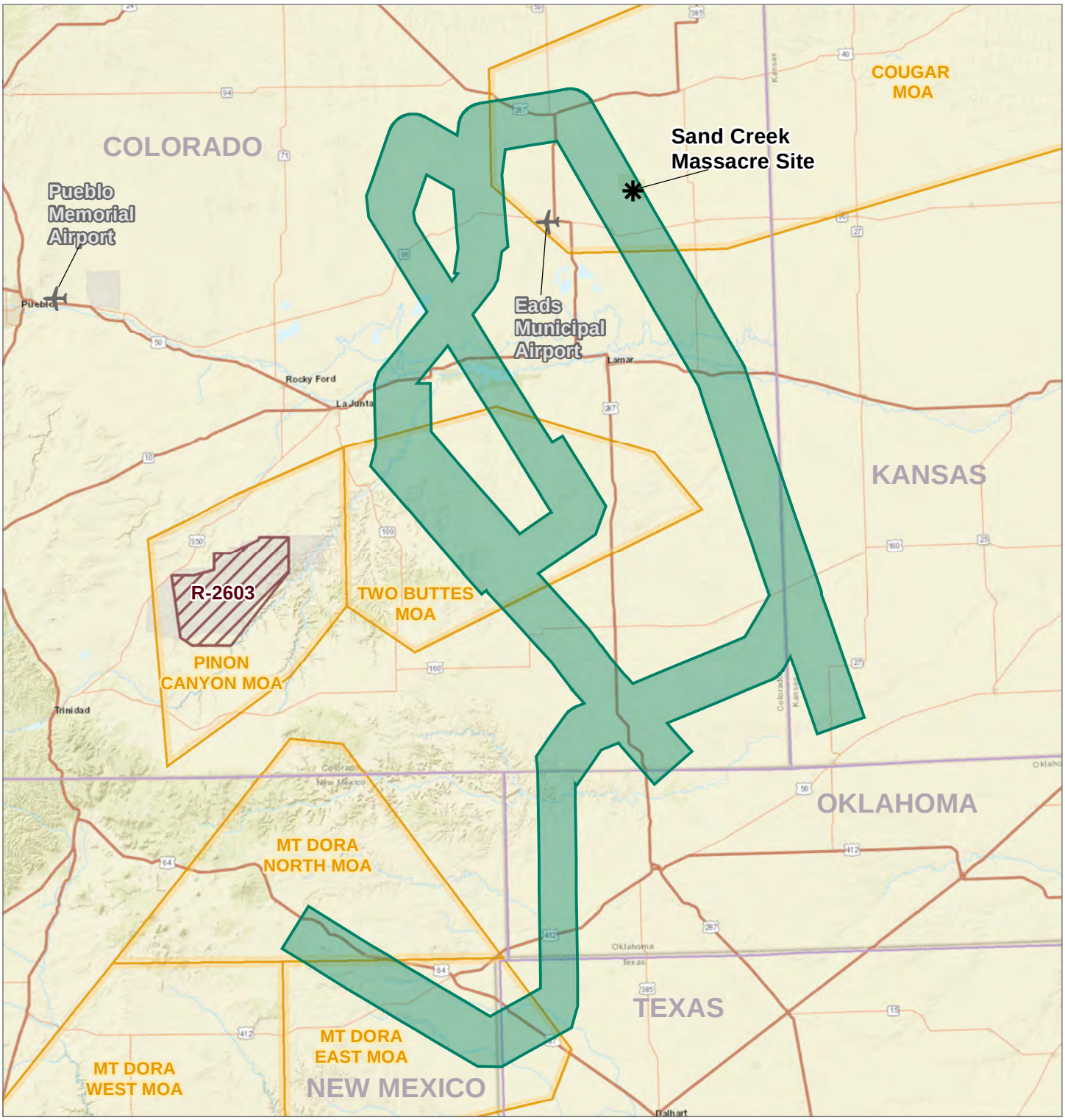


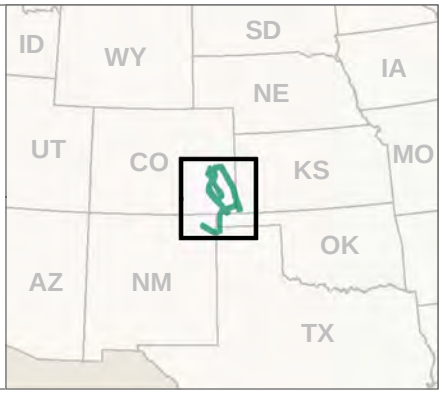
FIGURE 1-2
Legacy IR-177 MTR

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- IR-177 Existing Airspace

N

0 25 Miles

Coordinate System: WGS 1984 UTM Zone 13N



The Mt. Dora MOA is located 299 nm northwest of Altus AFB and reaches into New Mexico, Oklahoma, Texas, and Colorado. The Mt. Dora MOA is subdivided into three sections: Mt. Dora East, Mt. Dora West, and Mt. Dora North. Each subsection is further divided based on altitude into a high (11,000 feet MSL up to, but not including, 18,000 feet MSL) and a low (1,500 feet AGL up to, but not including, 11,000 feet MSL) MOA. Therefore, within the entire Mt. Dora complex, there is a total of six subsection MOAs: Mt. Dora East High MOA, Mt. Dora West High MOA, Mt. Dora North High MOA, Mt. Dora East Low MOA, Mt. Dora West Low MOA, and Mt. Dora North Low MOA. The entire complex is located within the Albuquerque ARTCC airspace; the Albuquerque ARTCC has jurisdiction and is the controlling agency for this SUA. The using agency is the 27th Special Operations Wing at Cannon AFB, New Mexico. Ten squadrons within the 27th Special Operations Wing fly the following platforms: MQ-9 Reaper, MC-130J Commando II, AC-130W Stinger II, CV-22B Osprey, and U-28A Draco. Times of use for all sections of the Mt. Dora MOA are active by NOTAM only.

1.3 PURPOSE AND NEED FOR ACTION

The purpose of the Proposed Action is to enable efficient C-17 sortie flow from an aerial refueling event to a low-level event for Altus AFB aircraft, de-conflict training with other Altus AFB-managed MTRs, and allow for concurrent training throughout Altus AFB-managed airspace.

The Proposed Action is needed to accomplish the following objectives:

- Provide Aircrews with access to low-level tactical ingress and egress, night-vision goggle operation, defensive maneuvering, simulated landing zone operation, and varied terrain and weather condition training scenarios in accordance with Air Force Instruction (AFI) 11-2C-17, Volume 3, *Flying Operations, C-17 Procedures*.
- Reduce impacts on flying training incurred by inclement weather conditions. The 97 AMW reports that 42 percent of its sortie cancellations are due to weather. IR-177 is geographically separated from existing IR-154, IR-155, and IR-193, located in Oklahoma and Texas, and would afford improved capabilities to schedule flights around weather conditions, which typically vary by geographic location.
- Provide Altus AFB with high-altitude descent planning into objective areas. The location of IR-177 allows aircraft to enter the MTR from altitudes up to 19,000 MSL and rapidly descend into low-altitude training environments. The ability to enter an IR at an altitude greater than 10,000 feet MSL allows pilots to maintain tactical airspeeds (above 250 knots), in compliance with 14 CFR Part 91, as they are training for future combat. The proposed route structure would allow the 97 AMW pilots under instruction to “train as they fight.”
- Improve low-level formation flight training capabilities. To effectively train C-17 Aircrew to perform high-speed/high-altitude ingress tactics to transition to low-level flight necessitates a MTR with a usable floor of 300 feet AGL. Currently the best option to train on these tactics is use of Visual Route 108 (managed by Cannon AFB, New Mexico), which has limited access due to scheduling availability and requires visual meteorological conditions to fly.
- Achieve higher fuel savings during training operations. Conducting training operations within IR-177, when compared to existing training options, would afford on average 6,000 pounds of fuel savings per sortie due to the route’s close proximity to air refueling (AR) track 312 and AR track 400.
- Increase flying training access to mountainous terrain. Improved mountainous low-level training access is necessary to effectively train C-17 Aircrew to adapt aircraft performance characteristics and limitations to effectively employ terrain masking operations.

1.4 INTERGOVERNMENTAL COORDINATION, PUBLIC AND AGENCY PARTICIPATION

The EIAP, in compliance with NEPA guidance, includes public and agency review of information pertinent to a proposed action and alternatives. The DAF’s compliance with the requirement for intergovernmental

coordination and public and agency participation begins with the scoping [3] process (40 CFR § 1502.4). Accordingly, and per Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, the DAF notified federal, state, and local agencies and tribal governments with jurisdiction that could potentially be affected by the Proposed Action and Alternatives via written correspondence throughout development of this EA.

1.4.1 Government-to-Government Consultation

The *National Historic Preservation Act* (54 USC § 300101, et seq.) (NHPA) and implementing regulations at 36 CFR Part 800 direct federal agencies to consult with federally recognized Native American tribes when a proposed action or alternatives may have an effect on tribal lands or on properties of religious and cultural significance to a tribe. Consistent with the NHPA, US Department of Defense (DoD) Instruction (DoDI) 4710.02, *DoD Interactions with Federally Recognized Tribes*, and DAF Instruction (DAFI) 90-2002, *Air Force Interaction with Federally Recognized Tribes*, the DAF invited federally recognized tribes that are historically affiliated with lands in the vicinity of the Proposed Action and Alternatives to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation and requires separate notification to all relevant tribes. The timelines for tribal consultation are also distinct from those of NEPA consultation. The Altus AFB point of contact for Native American tribes is the Base Commander. The point of contact for consultation with the Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation is the Altus AFB Cultural Resources Manager. A mailing list of the tribal government recipients of this invitation as well as a sample of the outgoing correspondence and all responses are included in **Appendix A.**

1.4.2 Agency Consultations and Coordination

Implementation of the Proposed Action involves coordination with several organizations and agencies. Compliance with Section 7 of the *Endangered Species Act of 1973*, as amended (16 USC § 1531 et seq.) (ESA) and implementing regulations (50 CFR Part 402) requires communication with the US Fish and Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration National Marine Fisheries Service. On 20 February 2024, the DAF initiated Section 7 consultation under the ESA for the Proposed Action using the USFWS's Information for Planning and Consultation (IPaC) tool. Basic information concerning the location and nature of the projects included in the Proposed Action was input into IPaC to obtain an official species list from the USFWS. The list identifies threatened and endangered species, other protected species (e.g., migratory birds), and critical habitat with potential to be affected by the Proposed Action. This information is included in **Appendix A** and incorporated into this EA where applicable.

Other federal agencies the DAF might coordinate with include the US Environmental Protection Agency (USEPA), Bureau of Land Management, National Park Service (NPS), US Forest Service (USFS), and Bureau of Indian Affairs.

The DAF will coordinate with the following state government agencies regarding potential effects from the Proposed Action and Alternatives:

- NHPA Section 106 compliance – Colorado, Kansas, New Mexico, and Oklahoma State Historic Preservation Offices (SHPOs)
- Air and water quality effects – Colorado Department of Public Health and Environment, Kansas Department of Health and Environment, and Oklahoma Department of Environmental
- Habitat and species of concern – Colorado Department of Parks and Wildlife (CPW), Kansas Department of Wildlife and Parks (KDWP), and Oklahoma Department of Wildlife Conservation

[3] Scoping is a process for determining the extent of issues to be addressed and analyzed in a NEPA document.

Notice of the Proposed Action and Alternatives was provided to elected officials that represent the states at the federal and local levels. A sample of agency correspondence and all responses are included in **Appendix A**.

1.4.3 Cooperating Agencies

The FAA has jurisdiction of the NAS by law, and utilization of IR-177 would require coordination with the FAA. The DAF invited the FAA to participate as a cooperating agency (40 CFR § 1501.8) by letter dated 4 August 2023, and the FAA accepted the DAF's request via letter dated 8 August 2023. Altus AFB coordinated with its Major Air Command, the AETC operations section, and the Air Force Representative to the FAA (AFREP) and engaged with the FAA Western Service Center. The FAA Western Service Center forwarded the proposed changes to IR-177 to the FAA ARTCC that are relevant to the MTR (Denver, Kansas City, and Albuquerque) and requested comments regarding the action and potential aeronautical impacts that could result from the proposal. The DAF's cooperating agency invitation, the acceptance from the FAA, and the FAA memo summarizing the conclusions of coordination can be found in **Appendix A.**

The redesigned route would require FAA approval because FAA administers the NAS. The Proposed Action includes standardizing the floor altitude of the route and would require the FAA to allow the use of this airspace by the DAF in the revised route. If the ARTCC and FAA Headquarters Airspace provide approval for the route, it would be published in the *Federal Register* and then sent to charting, where it would be made available to the public in aeronautical chart format. Coordination with the FAA is also crucial because the FAA would be responsible for providing instrument flight rule separation and coordination along all segments of IR-177. If the revised MTR is approved, the DAF would conduct training missions on IR-177. Before training missions are resumed, Letters of Agreement with regard to relevant procedures will require review and revision.

As a cooperating agency, the FAA will continue to coordinate closely with the DAF and will actively participate in the preparation of the Draft EA and Final EA. In accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the FAA will conduct an independent evaluation and analysis of this EA and may adopt the EA for purposes of making its decision regarding the FAA's Proposed Action pursuant to 40 CFR § 1506.3.

1.5 Public and Agency Review of Draft EA

The DAF invites the public and other interested stakeholders to review and comment on the Draft EA. Accordingly, a Notice of Availability of the Draft EA and Draft FONSI will be published in the following newspapers to commence a 30-day public comment period:

- *Prowers Journal* – Prowers County, Colorado
- *La Junta Tribune Democrat* – La Junta, Colorado
- *Kiowa County Press* – Eads, Colorado
- *Plainsman Herald* – Springfield, Colorado

During the public comment period, the Draft EA and Draft FONSI will be available online for view or download at https://www.altus.af.mil/About-Us/Environmental-Information/. Additionally, printed copies of the Draft EA and Draft FONSI will be placed at the following local libraries for review:

- Altus AFB Library – 109 E Ave, Altus AFB, OK 73523
- Altus Public Library – 421 N Hudson St, Altus, OK 73521

1.6 DECISION TO BE MADE

Based on the analysis in this EA, the DAF will make one of three decisions regarding the Proposed Action: 1) choose to implement the Proposed Action or Alternatives and sign a FONSI, allowing implementation of the preferred alternative; 2) initiate preparation of an EIS if it is determined that implementation of the Proposed Action and Alternatives would cause significant impacts to the human and natural environment; or 3) select the No Action Alternative, whereby the Proposed Action would not be implemented. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project and be available to inform decision-makers of the potential environmental impacts.

1.7 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA evaluates the potential environmental consequences of implementing the Proposed Action and Alternatives. This EA has been prepared in accordance with NEPA, CEQ regulations (40 CFR Parts 1500–1508), the DAF EIAP (32 CFR Part 989), and FAA Order 1050.1F. NEPA ensures that environmental information, including the anticipated environmental consequences of a proposed action, is available to the public, federal and state agencies, tribal governments, and the decision-maker before decisions are made and before actions are taken.

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

- Chapter 1, Purpose and Need for Action, includes an introduction and background on the project, location, purpose and need statements, intergovernmental coordination and public and agency participation, decision to be made, scope of the EA; and applicable laws and environmental regulations.
- Chapter 2, Description of the Proposed Action and Alternatives, includes a description of the Proposed Action, selection standards for alternatives, a description of the selected alternatives, application of selection standards, alternatives considered but eliminated from detailed analysis, a summary of potential environmental consequences, and any mitigation and environmental commitments.
- Chapter 3, Affected Environment and Environmental Consequences, includes a description of the natural and built environments within and surrounding IR-177 that may be affected by the Proposed Action and Alternatives. This chapter also includes a discussion of direct, indirect, and cumulative impacts.
- Chapter 4, List of Preparers, provides a list of the preparers of this EA.
- Chapter 5, References, contains references for studies, data, and other resources used in the preparation of this EA.
- Appendices, as required, provide relevant correspondence, studies, modeling results, and public review information.

NEPA, which is implemented through the CEQ regulations, requires federal agencies to consider alternatives to a proposed action and to analyze potential impacts of alternative actions. Potential impacts of the Proposed Action and Alternatives described in this EA will be assessed in accordance with the CEQ regulations, which require that federal agencies analyze the potentially affected environment and degree of the effects of the action.

1.8 APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS

Implementation of the Proposed Action and Alternatives would involve coordination with several organizations and agencies (see **Section 1.4**). Adherence to the requirements of specific laws, regulations, best management practices, and necessary permits are described in detail in each resource section in **Chapter 3**.

Other laws and regulations applicable to the Proposed Action include, but are not limited to:

- *Clean Air Act* (42 USC § 7401 et seq., as amended) (CAA)
- *Migratory Bird Treaty Act* (16 USC § 703–712) (MBTA)
- *Bald and Golden Eagle Protection Act of 1940* (16 USC §§ 668–668d) (BGEPA)
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994)
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks (1997), as amended by EO 13296* (2003)
- EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All* (2023)

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CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 DESCRIPTION OF THE PROPOSED ACTION

The DAF is requesting the utilization of IR-177 and standardization of the floor altitude for C-17 training out of Altus AFB to enable efficient C-17 sortie flow from an aerial refueling event to a low-level event for Altus AFB aircraft. IR-177 is an established MTR that was previously managed by Dyess AFB and used by B-1 aircraft but is not currently used. Utilization of IR-177 would allow training de-confliction with other Altus AFB-managed MTRs and allow for more concurrent training throughout Altus AFB-managed airspace. Under the Proposed Action; only the center portion of the legacy IR-177 would be retained and used. The Proposed Action also would include standardizing the floor altitude of this remaining route to 300 feet AGL. The DAF has determined that the Preferred Alternative within this EA is Alternative 3.

Details of the legacy IR-177 route, including coordinates, altitude data, width of route, and other important airspace information related to the route, can be found in DoD Area Planning Chart/Military Training Routes (AP/1B) Flight Information Publication, *Area Planning Military Training Routes, North and South America* (DoD, 2020). **Section 2.3** describes the legacy and proposed MTR segments of IR-177; provides a proposed renaming configuration for the MTR segments retained under the Proposed Action; and displays the legacy and proposed flight altitudes (lowest floor and highest ceiling levels) for each of the Alternatives. **Figure 2-1** shows the legacy IR-177 MTR as well as the MTR segments to be retained.

AIR REFUELING EVENTS OCCUR WHEN A TANKER AIRCRAFT ORBITS WITHIN A SET BLOCK OF ALTITUDES TO REFUEL OTHER AIRCRAFT.

LOW-LEVEL EVENTS INVOLVE MILITARY AIRCRAFT FLYING AT LOW ALTITUDES TO PREPARE THEIR PERSONNEL FOR REAL-WORLD TRAINING EVENTS SUCH AS COMBAT MANEUVERS AND AVOIDING ENEMY RADAR. NO WEAPONS, CHAFF, OR FLARES ARE EMPLOYED IN AN MTR.

NATIONAL SECURITY DEPENDS LARGELY ON THE DETERRENT EFFECT OF THE US AIRBORNE MILITARY FORCES. TO BE PROFICIENT, THE MILITARY SERVICES MUST TRAIN IN A WIDE RANGE OF AIRBORNE TACTICS. ONE PHASE OF THIS TRAINING INVOLVES LOW-LEVEL COMBAT TACTICS. THE REQUIRED MANEUVERS AND HIGH SPEEDS ARE SUCH THAT THEY MAY OCCASIONALLY MAKE THE SEE-AND-AVOID ASPECT OF FLIGHTS SUBJECT TO VISUAL FLIGHT RULES MORE DIFFICULT WITHOUT INCREASED VIGILANCE IN AREAS CONTAINING SUCH OPERATIONS.

2.1.1 Training Activities

Table 2-1 provides a summary of potential annual training activities that could occur within the repurposed portion of IR-177. Annual operations for the 97 AMW C-17 aircraft were derived from total numbers of low-level flights for the past two fiscal years (FYs) (2021 and 2022), as well as the projected number of flights for FY 2023. The 97 AMW anticipates a general increase in low-level flights from year to year. To capture this projection, the number of operations from the FY 2023 estimate was increased by 15 percent to create a conservative estimate of proposed use for IR-177. These totals were then divided among the low-level routes that Altus AFB controls. To be conservative, 50 percent of the low-level flights were attributed to IR-177. Training operations from Altus AFB would not increase as a result of the utilization of IR-177. The existing low-level training operations originating from Altus AFB would not change but would be divided among the MTRs that Altus AFB controls. There would be no new operations at Altus AFB under the Proposed Action. Altus AFB, as the using agency, would schedule and coordinate use of IR-177. All potential users of IR-177 would have to schedule use of the route through Altus AFB, which would have final say on approval. Route details and open times also would be published in the AP/1B and other FAA documentation. Details of these training activities are discussed below.

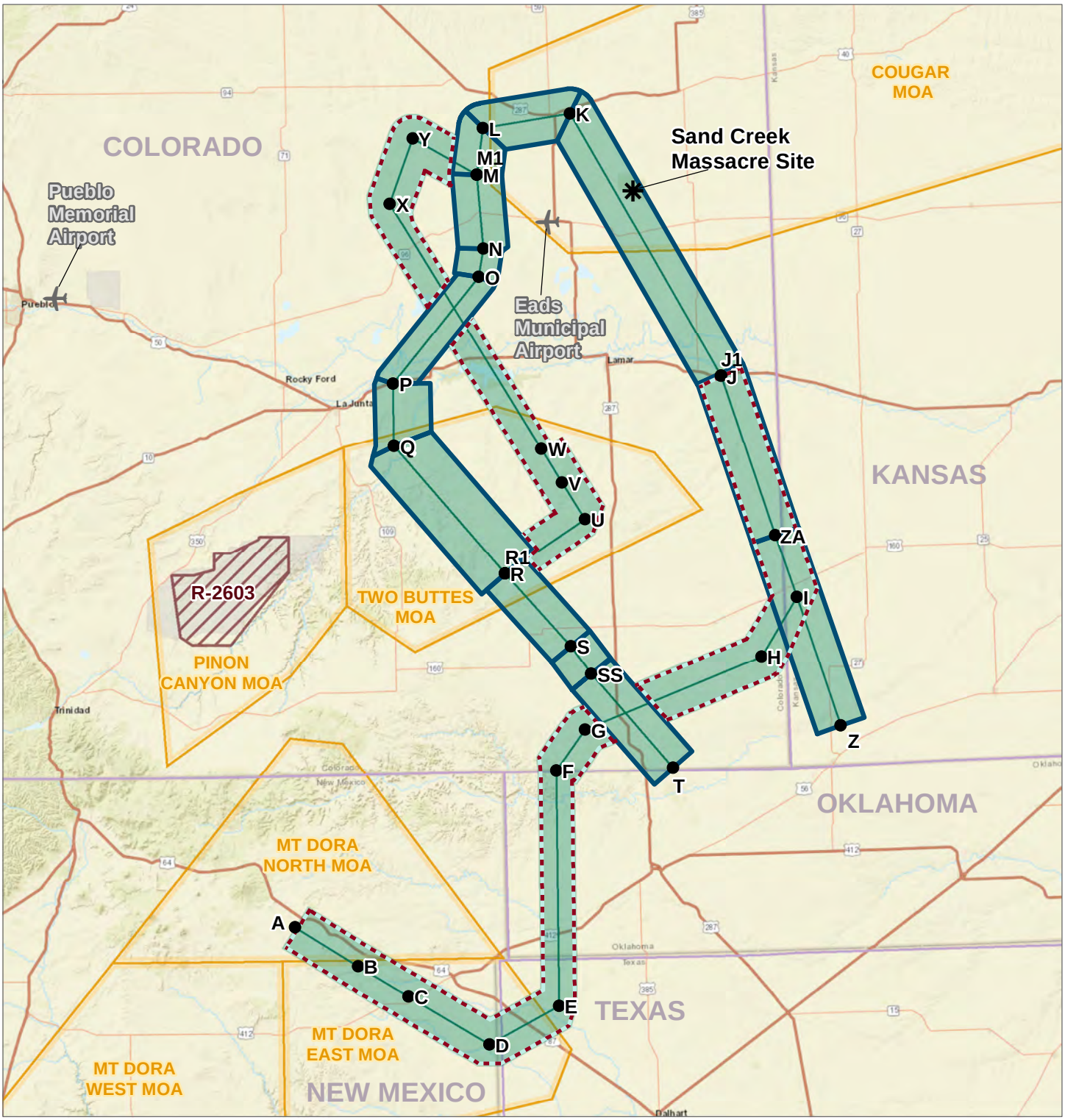


FIGURE 2-1
Legacy and Proposed IR-177 MTR

- IR-177 Waypoints
- Sand Creek Massacre Site
- IR-177 Airspace to be returned to National Airspace System
- IR-177 Proposed Airspace to Retain
- Military Operations Areas
- Restricted Airspace
- IR-177 Existing Airspace

N

0 25 Miles

Coordinate System: WGS 1984 UTM Zone 13N

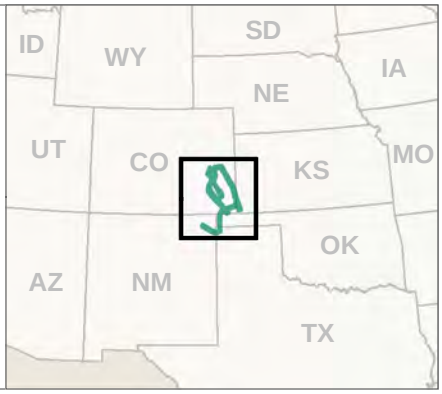


Table 2-1.
Proposed Annual Training Activities Within the IR-177 MTR

Activity	Aircraft Type	Day Operations[a]	Night Operations[b]	Total Annual Operations
97 AMW	C-17	566	134	700
140th Wing	F-16C	8	2	10
Transient	Fighters	36	4	40
Transient	Other[c]	64	6	70
Total Activities		**674**	**146**	**820**

Source: Altus AFB, 2022b; ANG/DAF, 2023
Notes:
a Acoustic day from 0700 to 2200 local time.
b Acoustic night from 2200 to 0700.
c This is an estimate of the mix of military non-fighter activity.
MTR = Military Training Route

The 97 AMW C-17 aircraft would utilize IR-177 for low-level training. Specifically, the C-17 training syllabus requires pilots to demonstrate expert level execution of low-level tactical ingress, low-level tactical egress, night-vision goggle operation, defensive maneuvering, and landing zone operations (DAF, 2011). Utilization of IR-177 would allow for these different training scenarios as well as providing proximity to AR track 312 and AR track 400, which lie to the northeast of IR-177. The proximity of IR-177 to these AR tracks would allow for combined training objectives and allow for more-efficient training scenarios. No weapons, chaff, or flares would be used for any of the training activities within the MTR.

The 97 AMW C-17 aircraft would utilize the IR-177 for single aircraft, two-aircraft formation, or three-aircraft training mission formations. If flying a two-aircraft training mission, the aircraft would likely fly abreast with a separation of 1 to 2 nm. Three-aircraft missions likely would be flown in a trailing formation due to the lateral limits of IR-177. The majority of training missions within IR-177 would be flown by single aircraft.

Two main types of low-level training would be conducted within IR-177: Air Land and Air Drop. These are simulated landing and dropping exercises that could be performed a number of times along the route for training purposes. Air Land exercises would be conducted on a simulated landing strip (i.e., a hypothetical landing zone along the route). For the training exercises, the C-17 would be operating at approximately 300 feet AGL at 310 knots. The pilot would then initiate landing procedures by slowing the aircraft to 130 knots. Following the completion of the landing simulation, the aircraft would resume power and speed of 310 knots, continuing along the low-level route.

Similarly, Air Drop training would require the pilot to initiate cargo-drop procedures over a simulated drop zone. The C-17 would approach the area at 300 feet AGL and slow from 310 knots to approximately 130 knots. The pilot would then initiate and complete a simulated cargo drop, power the aircraft back up, and resume low-level flight at 300 feet AGL and 310 knots along the route. Air Drop exercises likely would be flown in a two- or three-ship formation.

During a low-level training sortie, pilots may also practice defensive maneuvering—specifically, threat reaction practice. This could involve the aircraft making abrupt left- and righthand turns to practice evasive maneuvering. This may occur on average twice per sortie for approximately 20 seconds in duration. Given the width of IR-177, turns likely would be no more than 45 to 50 degrees of heading change to prevent overflying the lateral boundaries of the route.

Each C-17 training mission within IR-177 would last approximately 45 minutes. While it is possible that each mission could conduct training to a low elevation level of 300 feet AGL at 310 knots, 500 feet AGL may be more typical and would depend on pilot proficiency and safety conditions. Nighttime flights would be limited to 500 feet AGL minimum altitude for the C-17 aircraft.

Elkhart-Morton County Airport in Elkhart, Kansas, is a regional hub for medical evacuation by helicopter, which frequently utilizes instrument flight rule procedures. The FAA Kansas City Service Center has proposed a crossing altitude at or above 7,000 feet MSL to the north of the airport. The addition of the crossing altitude would allow uninterrupted instrument flight rule services at Elkhart-Morton County Airport. The DAF has agreed to add this requested crossing altitude restriction, represented by point "B," under the Proposed Action and all Alternatives.

2.1.2 Other Potential Users of the IR-177 Military Training Route

The 97 AMW anticipates that ANG and DAF units that use the MOAs and other MTRs in the area would want to use IR-177 for training upon reactivation. The 97 AMW has ownership of IR-177 and would control usage if the route is repurposed. For the purpose of planning potential impacts, all other users of IR-177 would be considered transient aircraft. Transient aircraft are those aircraft that may pass through an area or that may be stationed at a nearby Base temporarily before moving onto another final objective. For this scenario, in order to capture any other potential users of the MTR, the analysis in this EA included transient fighters and transient heavy aircraft. Transient fighters would be any military fighter aircraft (such as F-15, F-16, FA-18) that may use the route simply for low-level flying along the route or to access the Cougar or Two Buttes MOAs. At this time, the number of transient fighters that may utilize the MTR is an estimate. The proposed mix of ANG unit aircraft and other transient aircraft that could use the IR-177 MTR is shown above in **Table 2-1**.

The Colorado ANG 120th Fighter Squadron at Buckley AFB, Colorado, likely would make use of the repurposed IR-177 as value-added training for ingress into the Cougar or Two Buttes MOAs. The ANG 120th Fighter Squadron is the using agency of these two MOAs. Because IR-177 crosses through these MOAs, there is the potential for using the MTR for low-level flying before entering the MOA for other training objectives. The MTR would not be able to be used while the MOA is active, and the scheduling and usage of IR-177 in these areas would be managed through a written agreement between the DAF and ANG. These sorties would be flown with F-16 aircraft. An estimate of transient activity from Buckley AFB has been made for purposes of this EA. If the analyzed number of transient operations would ever be exceeded, additional environmental analysis would be conducted.

Transient "other" aircraft would include any military non-fighter aircraft, which could include military transport aircraft with the same general mission as the C-17. This category could also include heavy-jet aircraft such as the C-17, C-5, or KC-46. Smaller military transport aircraft would be considered heavy turboprop aircraft and would be represented by the C-130. Given that there are C-130 aircraft at nearby Canon AFB, New Mexico, it is possible that C-130 aircraft would utilize the route for low-level flights if the route is available and fits within Canon AFB training needs. AETC also has C-130 aircraft at Kirtland AFB, New Mexico, that may desire use of IR-177. Other transient aircraft could include military trainers such as the T-38 or T-6. An estimate of transient activity from Cannon and Kirkland AFBs has been made for purposes of this EA. If the analyzed number of transient operations would ever be exceeded, additional environmental analysis would be conducted.

2.2 SELECTION STANDARDS FOR ALTERNATIVES

In accordance with 32 CFR § 989.8(c), selection standards were developed to establish a means for determining the reasonableness of an alternative and whether an alternative should be carried forward for further analysis in the EA. Consistent with 32 CFR § 989.8(c), the following selection standards meet the purpose of and need for the Proposed Action and were used to identify reasonable alternatives for analysis in the EA. The supporting alternatives must:

1) Utilize existing available airspace areas to avoid lengthy FAA approvals and Aircraft Owners and Pilots Association (AOPA) concerns.
2) Allow Altus AFB to operate training missions consistently at 300 feet AGL.

3) Provide Altus AFB with the ability to maintain high-speed tactical entry and descent. This involves route structure that goes above 10,000 feet MSL at the entry and exit points so that pilots can comply with maximum speed restrictions below 10,000 feet MSL.
4) Minimize crossing route and other safety concerns including obstructions to navigation (e.g., wind farms).
5) Ensure the route is located within a 200-mile radius of Altus AFB to allow 6 hours of training and 4 hours for aircraft maintenance and other training preparations at Altus AFB before the aircraft conducts night training, if needed.
6) Guarantee proximity to AR tracks that Altus AFB manages, allowing a training mission to efficiently conduct refueling and low-level training on the same sortie.
7) Contain varied terrain types (low level/mountainous) required for mission training.
8) Include climate that maximizes the number of days of operation by having training routes available in geographically separate areas.
9) Utilize training routes for current and future mission requirements.

2.3 ALTERNATIVES

The NEPA and CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Action. “Reasonable alternatives” are those that could also be utilized to meet the purpose of and need for the Proposed Action. Alternatives were considered for each of the proposed projects. The NEPA process is intended to support flexible, informed, decision-making; the analysis provided by this EA and feedback from stakeholders will inform decisions made about whether, when, and how to execute the Proposed Action. Among the alternatives evaluated is the No Action Alternative, which evaluates the potential consequences of not undertaking the Proposed Action and serves to establish a comparative baseline for analysis. This section presents reasonable and practicable alternatives for projects where multiple, viable courses of action exist. Each alternative is assessed against the selection standards above and tabulated for applicability.

2.3.1 Alternative 1

Alternative 1 would lower and standardize the floor elevation of IR-177, and the MTR would remain in its current configuration. Under Alternative 1, portions of IR-177 would be repurposed, and the end state of IR-177 would be as shown in **Table 2-2** and **Figure 2-2**. The altitude floor of the MTR would be lowered to 300 feet AGL from legacy point ZA through legacy point Q. The waypoints within the utilized portions of IR-177 would be renamed, per the descriptions in **Table 2-2**. Alternative 1 would propose the training activities and annual sorties as described above in **Table 2-1**. Unused portions of the legacy IR-177 MTR would remain inactive under this alternative.

Alternative 1 would meet the purpose of and need for the Proposed Action, and training missions under Alternative 1 would be beneficial to Altus AFB. The flights would be conducted in their prescribed state by being able to maintain 300 feet AGL.

2.3.2 Alternative 2 – Operate IR-177 Using Current Configuration

Alternative 2 would differ from Alternative 1 in that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1 (see **Section 2.1** above and **Figure 2-2**). Alternative 2 also would propose the same training activities and annual sorties as Alternative 1 (see **Section 2.1.1** and **Table 2-2**). As under Alternative 1, unused portions of the legacy IR-177 MTR would remain inactive under Alternative 2.

Alternative 2 would meet the purpose of and need for the Proposed Action. Training missions under Alternative 2 would be beneficial to Altus AFB, but they would be conducted in a degraded state to avoid current FAA restrictions for IR-177. Not being able to fly and maintain 300 feet AGL would limit what pilots can take away from Altus AFB training courses. This would also cause C-17 maneuvers to be flown differently than what DAF tactics realistically prescribe. In addition, pilots would be limited in training opportunities due to a smaller amount of varied terrain available to conduct training missions.

Table 2-2.
Legacy and Proposed IR-177 Route Under the Proposed Action – Alternatives 1 and 2

Legacy Point Name	Legacy Altitude Data	Proposed Point Name	Proposed Altitude Data	Lat/Long
Z	5,700 MSL to 19,000 MSL	A	7,000 MSL to 19,000 MSL	N37°06.00' W101°52.00'
-	-	B	7,000 MSL to 15,000 MSL	N37°27.00' W102°00.00'
ZA	5,700 MSL	C	300 AGL to 7,000 MSL	N37°37.00' W102°04.03'
J1	5,700 MSL	D	300 AGL to 7,000 MSL	N38°03.00' W102°14.03'
K	500 AGL to 7,000 MSL	E	300 AGL to 7,000 MSL	N38°46.00' W102°43.50'
L	400 AGL to 7,000 MSL	F	300 AGL to 7,000 MSL	N38°44.00' W103°01.50'
M	200 AGL to 7,000 MSL	G	300 AGL to 7,000 MSL	N38°36.50' W103°03.00'
N	450 AGL to 7,000 MSL	H	300 AGL to 6,000 MSL	N38°24.50' W103°02.00'
O	450 AGL to 6,000 MSL	I	300 AGL to 6,000 MSL	N38°20.00' W103°03.00'
P	200 AGL to 6,000 MSL	J	300 AGL to 6,000 MSL	N38°03.00' W103°21.00'
Q	200 AGL to 6,000 MSL	K	300 AGL to 6,000 MSL	N37°53.00' W103°21.00'
R	200 AGL to 6,000 MSL	L	6,000 MSL to 11,000 MSL	N37°32.00' W102°59.00'
S	6,000 MSL to 11,000 MSL	M	7,000 MSL to 11,000 MSL	N37°20.00' W102°46.00'
SS	7,000 MSL to 11,000 MSL	N	7,000 MSL to 11,000 MSL	N37°15.50' W102°42.00'
T	11,000 MSL	O	11,000 MSL	N37°00.00' W102°26.00'
A	17,000 MSL	Not Utilized by Proposed Action	-	N36°35.50' W103°42.50'
B	17,000 MSL	Not Utilized by Proposed Action	-	N36°29.00' W103°30.00'
C	15,000 MSL	Not Utilized by Proposed Action	-	N36°24.00' W103°20.00'

Legacy Point Name	Legacy Altitude Data	Proposed Point Name	Proposed Altitude Data	Lat/Long
D	5,900 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N36°16.00' W103°04.00'
E	5,900 MSL	Not Utilized by Proposed Action	-	N36°22.00' W102°50.00'
F	200 AGL to 5,900 MSL	Not Utilized by Proposed Action	-	N37°00.00' W102°49.50'
G	200 AGL to 5,900 MSL	Not Utilized by Proposed Action	-	N37°06.50' W102°43.50'
H	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N37°17.50' W102°07.50'
I	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N37°27.00' W102°00.00'
J	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N38°03.00' }W102°14.00'
R1	6,000 MSL	Not Utilized by Proposed Action	-	37°32.00' W102°59.00'
U	6,000 MSL	Not Utilized by Proposed Action	-	N37°40.50' W102°42.50'
V	6,000 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N37°46.50' W102°47.00'
W	7,000 MSL	Not Utilized by Proposed Action	-	N37°52.00' W102°51.00'
X	6,000 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N38°32.00' W103°21.00'
Y	6,000 MSL	Not Utilized by Proposed Action	-	N38°42.50' W103°16.00'
M1	200 AGL to 6,000 MSL	Not Utilized by Proposed Action	-	N38°36.50' W103°03.00'

Source: DoD, 2020; Altus AFB, 2022a
Note:
a Hyphens indicate points that would not be utilized under the Proposed Action and thus would remain unchanged.
Lat/Long = latitude and longitude; N/A = not applicable, AGL = above ground level, MSL = mean sea level

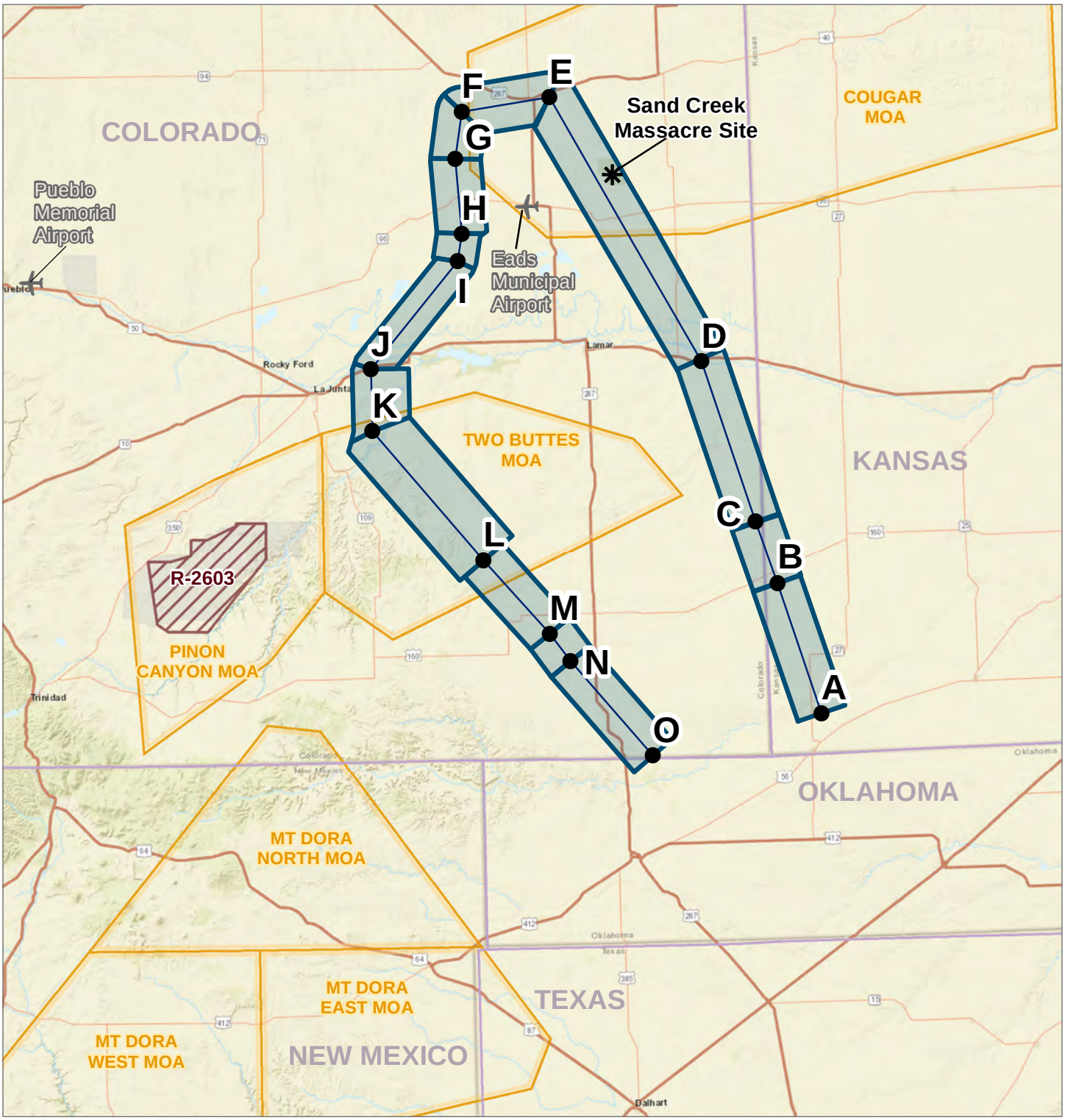


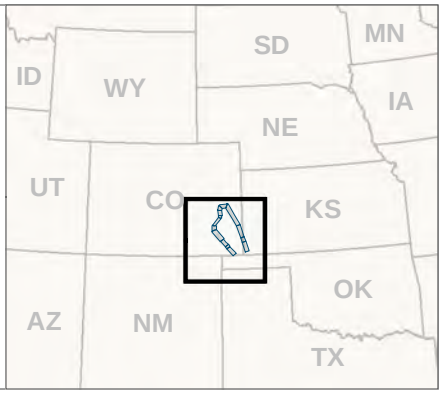
FIGURE 2-2
End State of IR-177 MTR – Alternatives 1 and 2

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- IR-177 Proposed Airspace to Retain

N

0 25 Miles

Coordinate System: WGS 1984 UTM Zone 13N



2.3.3 Alternative 3 – Operate IR-177 and Modify Legacy MTR Route Segment J1 to K (Preferred Alternative)

Alternative 3 would be similar to Alternative 1 as described in **Section 2.1**. However, Alternative 3 would modify the legacy route segment between J1 and K to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre NHS while avoiding Eads Municipal Airport by 3 nm (**Table 2-3** and **Figure 2-3**). This alternative would add two points to this MTR segment (Points E and F in **Table 2-3**) and allow 4 nm on either side of the centerline, which would maintain the route structure and grant aircraft operating in IR-177 increased capability to navigate around the Sand Creek Massacre NHS while retaining navigable training operations. This MTR modification would have a proposed lowest altitude of 300 feet AGL and a proposed highest altitude of 7,000 MSL. Further, the DAF would specify in the AP/1B describing the IR-177 special operating procedures that aircraft would avoid overflying or operating within a 5-nm buffer around the Sand Creek Massacre NHS. By modifying the MTR in this route segment, the DAF would be able to conduct its mission operations with no restrictions while lessening potential visual and noise impacts to people visiting and using the Sand Creek Massacre NHS.

Table 2-3.
Legacy and Proposed IR-177 Route Under the Proposed Action – Alternative 3 (Preferred)

Legacy Point Name	Legacy Altitude Data	Proposed Point Name	Proposed Altitude Data	Lat/Long
Z	5,700 MSL to 19,000 MSL	A	7,000 MSL to 19,000 MSL	N37°06.00' W101°52.00'
-	-	B	7,000 MSL – 15,000 MSL	N37°27.00' W102°00.00'
ZA	5,700 MSL	C	300 AGL to 7,000 MSL	N37°37.00' W102°04.03'
J1	5,700 MSL	D	300 AGL to 7,000 MSL	N38°03.00' W102°14.03'
-	-	E	300 AGL to 7,000 MSL	N38°36.00' W102°44.00'
-	-	F	300 AGL to 7,000 MSL	N38°34.00' W102°64.10'
K	500 AGL to 7,000 MSL	G	300 AGL to 7,000 MSL	N38°46.00' W102°43.50'
L	400 AGL to 7,000 MSL	H	300 AGL to 7,000 MSL	N38°44.00' W103°01.50'
M	200 AGL to 7,000 MSL	I	300 AGL to 7,000 MSL	N38°36.50' W103°03.00'
N	450 AGL to 7,000 MSL	J	300 AGL to 6,000 MSL	N38°24.50' W103°02.00'
O	450 AGL to 6,000 MSL	K	300 AGL to 6,000 MSL	N38°20.00' W103°03.00'
P	200 AGL to 6,000 MSL	L	300 AGL to 6,000 MSL	N38°03.00' W103°21.00'
Q	200 AGL to 6,000 MSL	M	300 AGL to 6,000 MSL	N37°53.00' W103°21.00'
R	200 AGL to 6,000 MSL	N	6,000 MSL to 11,000 MSL	N37°32.00' W102°59.00'
S	6,000 MSL to 11,000 MSL	O	7,000 MSL to 11,000 MSL	N37°20.00' W102°46.00'

Legacy Point Name	Legacy Altitude Data	Proposed Point Name	Proposed Altitude Data	Lat/Long
SS	7,000 MSL to 11,000 MSL	P	7,000 MSL to 11,000 MSL	N37°15.50' W102°42.00'
T	11,000 MSL	Q	11,000 MSL	N37°00.00' W102°26.00'
A	17,000 MSL	Not Utilized by Proposed Action	-	N36°35.50' W103°42.50'
B	17,000 MSL	Not Utilized by Proposed Action	-	N36°29.00' W103°30.00'
C	15,000 MSL	Not Utilized by Proposed Action	-	N36°24.00' W103°20.00'
D	5,900 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N36°16.00' W103°04.00'
E	5,900 MSL	Not Utilized by Proposed Action	-	N36°22.00' W102°50.00'
F	200 AGL to 5,900 MSL	Not Utilized by Proposed Action	-	N37°00.00' W102°49.50'
G	200 AGL to 5,900 MSL	Not Utilized by Proposed Action	-	N37°06.50' W102°43.50'
H	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N37°17.50' W102°07.50'
I	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N37°27.00' W102°00.00'
J	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N38°03.00' W102°14.00'
R1	6,000 MSL	Not Utilized by Proposed Action	-	N37°32.00' W102°59.00'
U	6,000 MSL	Not Utilized by Proposed Action	-	N37°40.50' W102°42.50'
V	6,000 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N37°46.50' W102°47.00'
W	7,000 MSL	Not Utilized by Proposed Action	-	N37°52.00' W102°51.00'
X	6,000 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N38°32.00' W103°21.00'
Y	6,000 MSL	Not Utilized by Proposed Action	-	N38°42.50' W103°16.00'
M1	200 AGL to 6,000 MSL	Not Utilized by Proposed Action	-	N38°36.50' W103°03.00'

Source: DoD, 2020; Altus AFB, 2022a
Note:
a Hyphens indicate points that would not be utilized under the Proposed Action and thus would remain unchanged.
Lat/Long = latitude and longitude; N/A = not applicable, AGL = above ground level, MSL = mean sea level

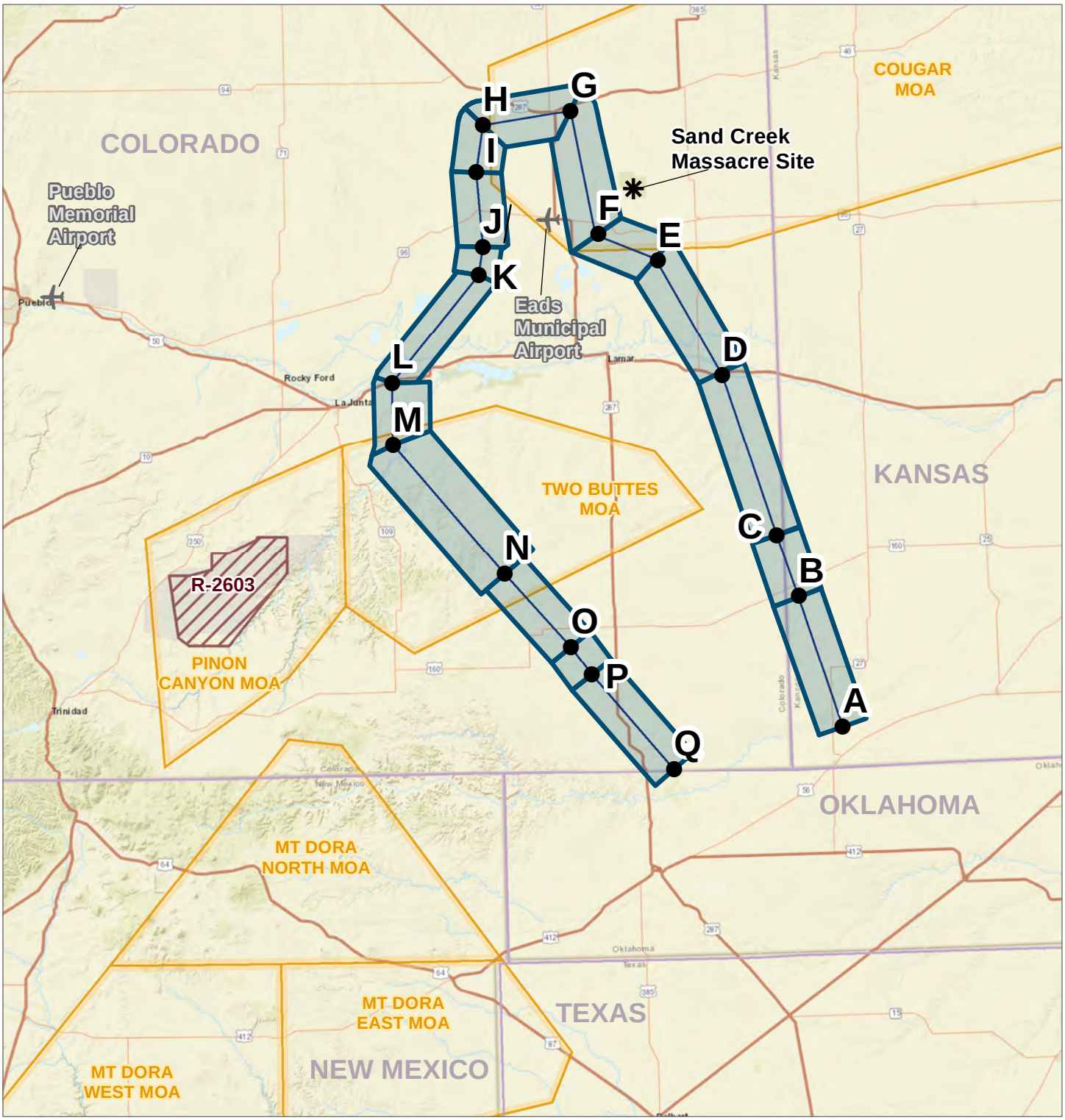


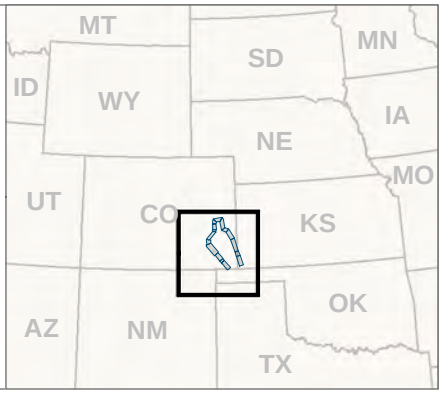
FIGURE 2-3
End State of IR-177 MTR – Alternative 3

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- IR-177 Proposed Airspace to Retain

N

0 25 Miles

Coordinate System: WGS 1984 UTM Zone 13N



2.3.4 No Action Alternative

Under the No Action Alternative, utilization and standardization of the floor of IR-177 would not occur. Altus AFB C-17 pilot training would remain limited in MTR availability needed to offset the effects of inclement weather, practice high-altitude descents, perform terrain masking tactics in mountainous areas, and fly formation flight tactics at low level.

Under the No Action Alternative, Altus AFB would continue to use MTRs in the same geographic region. Poor weather conditions within the existing MTRs would continue to cause cancellation of Altus AFB training missions because no alternate training route is available. Further, training in existing MTRs provides limited vertical terrain features, denying pilots the experience of training in varied terrain.

While the No Action Alternative would not satisfy the purpose of and need for the Proposed Action, this alternative is retained to provide a comparative baseline against which to analyze the environmental effects of the Proposed Action, as required under the CEQ regulations (40 CFR § 1502.14(d)). The No Action Alternative reflects the status quo and serves as a benchmark against which the effects of the Proposed Action can be evaluated.

2.4 APPLICATION OF SELECTION STANDARDS

Table 2-4 provides a comparison of the alternatives considered and how they meet the selection standards listed in **Section 2.2** and whether they meet the purpose of and need for the Proposed Action.

Table 2-4.
Comparison of Alternatives

Selection Standards		Alternative Actions[a]			
		Alternative 1	Alternative 2	Alternative 3 (Preferred)	No Action
1	Utilize existing available airspace	Yes	Yes	Yes	Yes
2	Allow Altus AFB to operate consistently at 300 feet AGL	Yes	Limited	Yes	No
3	Provide Altus AFB with ability to maintain high-speed tactical entry and descent	Yes	Yes	Yes	Yes
4	Minimize crossing route and safety concerns	Yes	Yes	Yes	No
5	Ensure route is within 200-mile radius of Altus AFB	Yes	Yes	Yes	Yes
6	Guarantee proximity to refueling tracks that Altus AFB owns	Yes	Yes	Yes	Yes
7	Contain varied terrain types in geographically separate areas	Yes	Limited	Yes	No
8	Include climate that supports the maximum number of days of operation	Yes	Yes	Yes	No
9	Utilize training route for current and future mission requirements	Yes	Yes	Yes	Yes

Note:
a Cell terminology: Yes = fulfills selection standards; Limited = has limited restrictions based on selection standards; No = does not fulfill selection standards
AFB = Air Force Base; AGL = above ground level

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Two alternatives were considered but eliminated from further consideration because they did not meet the selection standards for the Proposed Action as outlined above.

- **Use a different MTR within the vicinity of Altus AFB.** This alternative was dismissed because it does not meet selection standards 2, 4, 7, or 8. Altus AFB currently manages 15 MTRs but is limited to using 3 to 4 due to safety concerns related to crossing routes used by Sheppard AFB and Vance AFB (selection standard #4). In addition, deconflicting of these routes would be time consuming and challenging. Further, these existing MTRs do not allow training missions to operate consistently at 300 feet AGL (selection standard #2), do not contain enough varied terrain types that reflect real-world combat training (selection standard #7), and training missions in these existing MTRs have been cancelled over 40 percent of the time over the past 3 years due to inclement weather conditions (selection standard #8).
- **Create a new route to accommodate Altus AFB's mission.** This alternative was dismissed because it does not meet selection standard 1 (utilize existing available airspace). The FAA and DAF require utilization of existing airspace whenever possible because there is a limited amount of airspace available in the already highly saturated National Airspace System (NAS). Creating a new route would require extensive FAA approvals, cause significant time delays to create and approve the new route, affect a whole new set of people/land areas that have not been used to occasional low-level military overflights, and could cause concerns with the AOPA.

2.6 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The potential impacts associated with the Proposed Action, Alternatives, and No Action Alternative are summarized in **Table 2-5**. The summary is based on information discussed in detail in **Chapter 3** (Affected Environment and Environmental Consequences) of this EA and includes a concise definition of the issues addressed and the potential environmental impacts associated with each alternative.

Table 2-5.
Summary of Environmental Consequences

Resource Area	Alternative 1	Alternative 2	Alternative 3 (Preferred)	No Action
Airspace Management	No significant impacts to airspace management and the use of MTRs under Alternative 1.	No significant impacts to airspace management and the use of MTRs under Alternative 2.	No significant impacts to airspace management and the use of MTRs under Alternative 3.	No change to airspace management within the MTR.
Air Quality, including Climate Change and Greenhouse Gas	No significant impacts to air quality, including climate change and greenhouse gases under Alternative 1.	No significant impacts to air quality, including climate change and greenhouse gases under Alternative 2.	No significant impacts to air quality, including climate change and greenhouse gases under Alternative 3.	No change to air quality, including climate change and greenhouse gases within the MTR.
Operational Noise	No significant impacts to operational noise under Alternative 1.	No significant impacts to operational noise under Alternative 2.	No significant impacts to operational noise under Alternative 3.	No change to the noise environment within the MTR.
Cultural Resources	No adverse effects to historic architecture, archaeological sites, or TCPs under Alternative 1.	No adverse effects to historic architecture, archaeological sites, or TCPs under Alternative 2.	No adverse effects to historic architecture, archaeological sites, or TCPs under Alternative 3.	No change to cultural resources underneath the MTR.
Biological/Natural Resources	No significant impacts to biological or natural resources under Alternative 1. May affect but is not likely to adversely affect threatened and endangered species.	No significant impacts to biological or natural resources under Alternative 2. May affect but is not likely to adversely affect threatened and endangered species.	No significant impacts to biological or natural resources under Alternative 3. May affect but is not likely to adversely affect threatened and endangered species.	No change to biological or natural resources within the MTR.
Land Use	No significant impacts to land use under Alternative 1.	No significant impacts to land use under Alternative 2.	No significant impacts to land use under Alternative 3.	No change to land use underneath the MTR.
Socioeconomics	No significant impacts to socioeconomics under Alternative 1.	No significant impacts to socioeconomics under Alternative 2.	No significant impacts to socioeconomics under Alternative 3.	No change to socioeconomics underneath the MTR.
Environmental Justice and Protection of Children	No significant impacts to communities of environmental justice concern. No significant impacts to children under Alternative 1.	No significant impacts to communities of environmental justice concern. No significant impacts to children under Alternative 2.	No significant impacts to communities of environmental justice concern. No significant impacts to children under Alternative 3.	No change to communities of environmental justice concern or children within the MTR.
Safety and Occupational Health	No significant impacts to safety and occupational health under Alternative 1.	No significant impacts to safety and occupational health under Alternative 2.	No significant impacts to safety and occupational health under Alternative 3.	No change to safety and occupational health within the MTR.

CHAPTER 3 EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

3.1 FRAMEWORK FOR ANALYSIS

To provide a framework for the analyses in this EA, the DAF defined a study area specific to each resource or sub-resource area. Referred to as a Region of Influence (ROI), these areas delineate a boundary where possible effects from the considered alternatives would have a reasonable likelihood to occur. Beyond these ROIs, potential adverse effects on resources would not be anticipated. For the purposes of analysis, impacts are described as follows:

- **Beneficial –** positive effects that improve or enhance resource conditions
- **Adverse –** negative or harmful results
- **Negligible –** effects likely to occur but at levels not readily observable by evaluation
- **Minor –** observable, measurable, tangible effects qualified as below one or more significance threshold(s)
- **Moderate –** tangible effects that are readily apparent, qualified as below one or more significance threshold(s)
- **Significant –** obvious, observable, verifiable effects qualified as above one or more significance threshold(s); not mitigable to below significance

When relevant to the analyses in this EA, potential effects are further defined as direct or indirect; short- or long-term; and temporary, intermittent, or permanent. Based upon the nature of the Proposed Action and the affected environment, both qualitative and quantitative thresholds were used as benchmarks to qualify effects. Further, each resource analysis section (i.e., **Sections 3.4–3.12**) concludes with a cumulative effects analysis considering the effects on the environment that result from the incremental effects of the Proposed Action when added to the effects of other past, present, and reasonably foreseeable actions within the project area. **Table 3-1** briefly describes the proposed or planned projects identified for consideration of potential cumulative impacts when combined with the effects of the Proposed Action on a regional scale. The location of these project in relation to the Proposed Action can be seen in **Figure 3-1**.

Table 3-1.
Past, Present, and Reasonably Foreseeable Actions for Cumulative Impacts Analysis

Name	Description	Timeframe	Approximate Distance
Cannon AFB – Utilization of IR 320, 500, and 501	The 27th Special Operations Wing at Cannon Air Force Base, New Mexico, is requesting utilization from the Federal Aviation Administration for IR 320, 500, and 501 for aircraft training to fulfill low-level training requirements with the CV-22 and MC-130 aircraft to ensure Aircrews are properly trained to meet operational requirements. IR 500 and 501 have direct geographic overlap with IR 177 for the majority of the proposed MTR to be retained. Anticipated utilization of these routes is currently undefined.	FY 2025	0 Mile
Cougar MOA Modification	The 140th Wing of the Colorado Air National Guard expanded the lateral boundaries of the Cheyenne MOAs to the west, southwest, south, southeast, and east and subdivided the airspace into the following components: Bobcat MOA, Cougar Low and High MOAs, Bobcat Air Traffic Controlled Assigned Airspace (ATCAA), and the Cougar East/West ATCAAs. Specifically, the Cheyenne Low MOA was extended west, southwest, south, southeast, and east and renamed the Cougar Low MOA. The action did not change the utilization of the airspace.	2013	0 Mile

ATCAA = Air Traffic Controlled assigned Airspace; FY = fiscal year; IR = instrument route; MOA = military operations area; MTR = military training route;

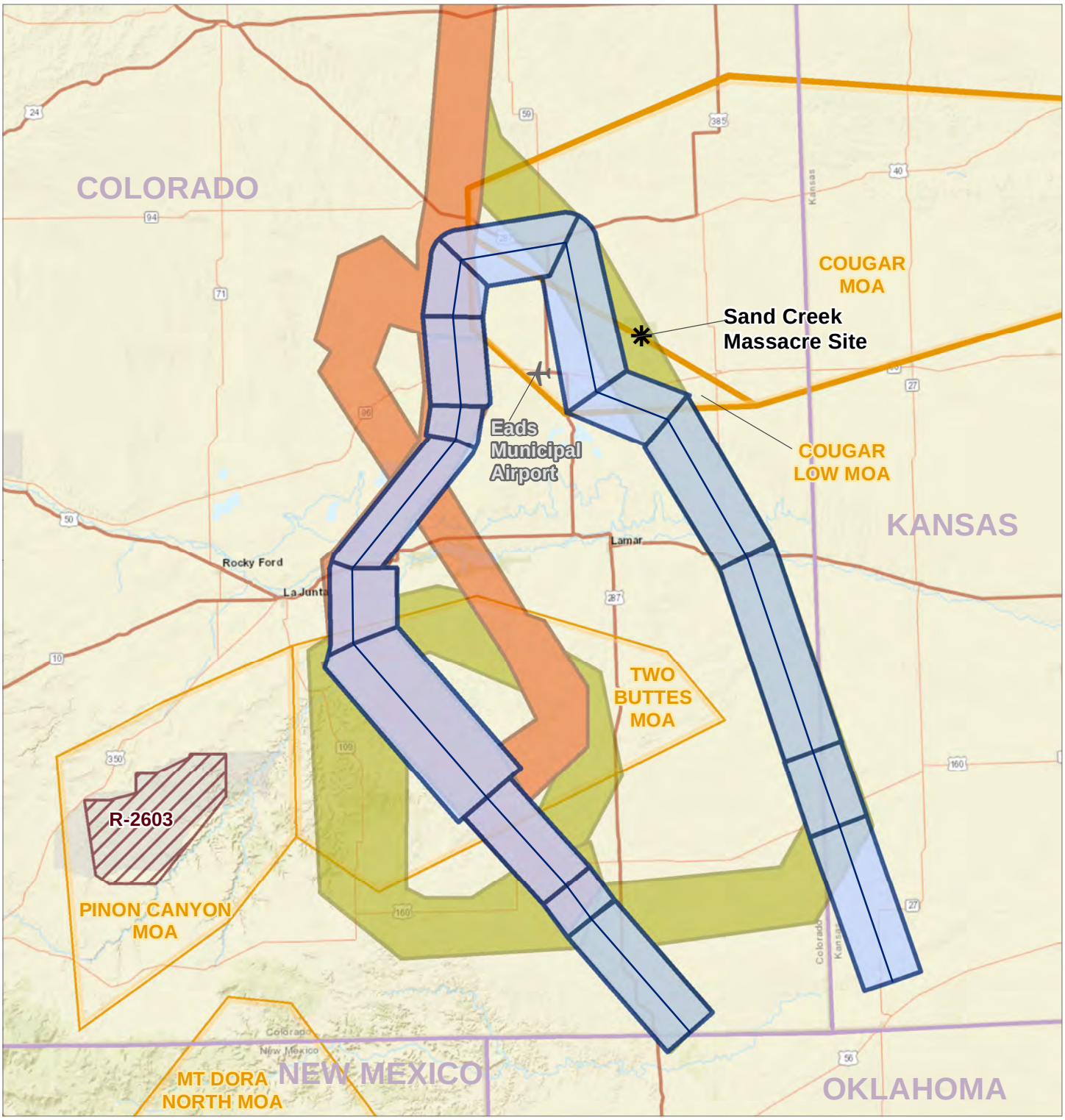


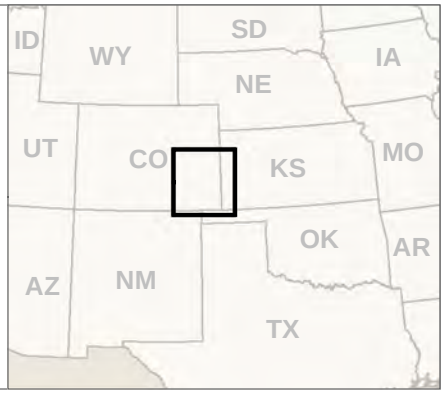
FIGURE 3-1
Regional Projects for Cumulative Analysis

- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- IR-177 Proposed Airspace to Retain
- IR-501
- IR-500

N

0 25 Miles

Coordinate System: WGS 1984 UTM Zone 13N



3.2 RESOURCES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

CEQ regulations state that federal agencies should "identify and eliminate from detailed study the issues which are not significant, or which have been covered by prior environmental review" (40 CFR § 1502.4(d)(1)). Accordingly, the DAF considered but eliminated from further analysis water resources, earth resources, utilities and infrastructure,[4] and hazardous materials and waste. The Proposed Action would only involve the utilization of an existing MTR, modifying the frequency, tempo, and volume of current aircraft training and operations. The Proposed Action would not involve any construction or ground-disturbing activities and would have no potential to disturb these four resource areas.

3.3 RESOURCES CARRIED FORWARD FOR DETAILED ANALYSIS

Based on the results of internal and external scoping (see **Section 1.4**), the following resources were carried forward for analysis: airspace management, air quality, including climate change and greenhouse gas, operational noise, cultural resources, biological resources, land use, socioeconomics, environmental justice and protection of children, and safety and occupational health. Visual resources are evaluated within **Section 3.7** (Cultural Resources) and **Section 3.9** (Land Use).

3.4 AIRSPACE MANAGEMENT

3.4.1 Definition of the Resource

3.4.1.1 Airspace Management

The FAA manages all airspace within the US and the US territories. Airspace, which is defined in vertical and horizontal dimensions and by time, is considered to be a finite resource that must be managed for the benefit of all aviation sectors including commercial, general, and military aviation.

3.4.1.2 Regulatory Setting

Procedures governing the use of training areas and airspace operated and controlled by the DAF are included in Air Force Policy Directive (AFPD) 13-2, *Air Traffic, Airfield, Airspace and Range Management*, and its implementing regulations. The DAF manages airspace in accordance with processes and procedures detailed in Department of the Air Force Manual (DAFMAN) 13-201, *Airspace Management*. DAFMAN 13-201 also provides the guidance and procedures used to develop and process MTR actions. The proposed MTR would primarily be used by aircraft from Altus AFB but would be available to all DoD aircraft. Users would follow service specific policy for airspace management and procedures. Other applicable regulations regarding MTR management include specific FAA Orders.

The MTR program was established by the FAA and the DoD for the purpose of conducting low-altitude and/or high-speed training. MTRs are established in accordance with criteria in FAA Order 7610.4, *Special Operations*. FAA Order 7610.14, *Non-Sensitive Procedures and Requirements for Special Operations*, establishes procedures and requirements for Air Traffic Control planning and coordination and complements FAA Order 7610.4. The FAA has approval authority over the establishment of IRs. The DoD AP/1B is the official source of MTR information for military users (effective 21 March 2024).

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (16 July 2015), provides FAA policy and procedures to ensure agency compliance with the requirements set forth in the CEQ regulations for implementing the provisions of Department of Transportation Order 5610.1C, *Procedures for Considering*

[4] Potential impacts to wind farms are analyzed under **Section 3.9** (Land Use).

Environmental Impacts, and other related statutes and directives. FAA Order JO 7400.2P, *Procedures for Handling Airspace Matters* (20 April 2023), provides procedures for administration of the airspace program.

3.4.2 Existing Conditions

The Proposed Action would utilize the currently unused "legacy" IR-177 as described in **Section 2.1** and within **Appendix B**. The proposed IR-177 routing would repurpose portions of the existing MTR airspace and standardize the floor elevation. IR-177 currently traverses the Cougar MOA, Two Buttes MOA, and the Mt. Dora North and East MOAs. Under the Proposed Action, portions of IR-177 would continue to pass through the Cougar MOA and the Two Buttes MOA; however, the portion traversing the Mt. Dora North and East MOAs would no longer exist.

The ROI for airspace includes the proposed IR-177 MTR.

3.4.3 Environmental Consequences

The analysis of airspace use considers the potential impacts to airports and airspace in the vicinity of the reconfigured IR-177. A detailed airspace impact analysis is provided in **Appendix B**. This analysis describes the potential impacts to nearby airports, instrument approach procedures, and affected air traffic service routes; the results of that analysis are summarized herein.

3.4.3.1 Alternative 1

The expected activation of IR-177 would be continuous as scheduled by the using agency. Potential impacts to civil traffic and the surrounding airports and airspace would only occur when the MTR is active. Full analysis of the airspace in the vicinity of IR-177 is provided in **Appendix B.**

Alternative 1 would standardize the IR-177 floor elevation at 300 feet AGL for the portions of the route that would be repurposed. Under Alternative 1, IR-177 has the potential to affect instrument approach procedures at various airports in the vicinity of the route. The impact is notable when approaches are flown using the full published procedure. There may be impacts to the air traffic service routes which flow through the LAMAR radio navigation system if aircraft fly at the route's minimum en-route altitude. These flights would require alternate routing or altitude deconfliction when the MTR is active. There would be no new impacts in the established Cougar MOA and Two Buttes MOA and existing exclusions within those MOAs would remain in place. IR-177 cannot be used when the MOAs are active; therefore, Altus AFB personnel and the Colorado ANG may require an agreement to deconflict times of use. Impacts to scheduling and management of existing IRs and MOAs would be handled internally among the DAF agencies and impacts are not anticipated. Therefore, significant, adverse impacts to airspace management would not be anticipated with implementation of Alternative 1.

3.4.3.2 Alternative 2

Impacts under Alternative 2 would be the same as those under Alternative 1. The only change under Alternative 2 would be that the floor would not be standardized to 300 feet, limiting the types of training available to pilots. Alternative 2 would not result in any additional impacts other than those described above and within **Appendix B**.

3.4.3.3 Alternative 3 (Preferred Alternative)

Impacts under Alternative 3 would be the same as those under Alternative 1. The only change under Alternative 3 would be the additional waypoints added to allow additional lateral space to avoid the Sand Creek Massacre NHS. Alternative 3 would not result in any additional impacts other than those described above and within **Appendix B**.

3.4.3.4 No Action Alternative

Under the No Action Alternative, the IR-177 would not be utilized or reconfigured. There would be no change to the availability of existing MTRs utilized by Altus AFB as no new sorties from Altus AFB would be flown within the IR-177 MTR. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.4.3.5 Cumulative Impacts

Cumulative impacts to airspace from the Proposed Action would be expected to be minor. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR-500 and 501 would occupy portions of the same airspace as IR-177 in southeastern Colorado. Although the anticipated utilization of those IRs is not currently known, the MTR has capacity and is in locations with the dimensions necessary to support the flight activities proposed. The Cougar MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace. When considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, no significant cumulative impacts to airspace management would be anticipated to occur with implementation of the Proposed Action.

3.5 AIR QUALITY, INCLUDING CLIMATE CHANGE AND GREENHOUSE GAS

3.5.1 Definition of Resource

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interaction of emissions, meteorology, and chemistry. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances.

Air pollution is a threat to human health and damages trees, crops, other plants, lakes, and animals. It creates haze or smog that reduces visibility in national parks and cities and interferes with aviation. To improve air quality and reduce air pollution, Congress passed the *Clean Air Act* (42 USC § 7401) (CAA) and its amendments in 1970 and 1990, which set regulatory limits on air pollutants and help to ensure basic health and environmental protection from air pollution.

3.5.1.1 Criteria Pollutants

In accordance with CAA requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. Measurements of these “criteria pollutants” in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Regional air quality is a result of the types and quantities of atmospheric pollutants and pollutant sources in an area as well as surface topography and prevailing meteorological conditions.

The CAA directed the USEPA to develop, implement, and enforce environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed numerical concentration-based standards, the National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment and established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for the following air pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, 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. The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops,

and other public resources in addition to maintaining visibility standards. The primary and secondary NAAQS for the criteria pollutants are presented in **Table 3-2.**

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

Table 3-2.
National Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Primary/Secondary[a,b]	Averaging Time	Level
Carbon Monoxide	Primary	8 hours	9 ppm
	Primary	1 hour	35 ppm
Nitrogen Dioxide	Primary	1 hour	100 ppb
	Primary and Secondary	1 year	53 ppb
Ozone	Primary and Secondary	8 hours	0.070 ppm
$PM_{2.5}$	Primary	1 year	9.0 µg/m^3
	Secondary	1 year	15 µg/m^3
	Primary and Secondary	24 hours	35 µg/m^3
PM_{10}	Primary and Secondary	24 hours	150 µg/m^3
Sulfur Dioxide	Primary	1 hour	75 ppb
	Secondary	3 hours	0.5 ppm
Lead	Primary and Secondary	Rolling 3-month average	0.15 µg/m^3

Source: USEPA NAAQS table
Notes:
a Primary Standards: the levels of air quality necessary, with an adequate margin of safety, to protect public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.
b Secondary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; ppm = parts per million; ppb = parts per billion.

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

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels.

3.5.1.2 General Conformity Rule for Criteria Pollutants

When a region or area meets NAAQS for a criteria pollutant, that region or area is classified as in "attainment" for that pollutant. When a region or area fails to meet NAAQS for a criteria pollutant, that region or area is classified as "nonattainment" for that pollutant. In cases of nonattainment, the affected state, territory, or local agency must develop a state implementation plan (SIP) for USEPA review and approval. The SIP is an enforceable plan developed at the state level that lays out a pathway for how the state will comply with air quality standards. If air quality improves in a region that is classified as nonattainment, and

the improvement results in the region meeting the criteria for classification as attainment, then that region is reclassified as a "maintenance" area.

Federal actions are required to conform with the approved SIP for those areas of the US designated as nonattainment or maintenance areas for any criteria air pollutant under the CAA (40 CFR § 93.158). The purpose of the General Conformity Rule is to ensure that applicable federal actions, such as the Proposed Action, would not cause or contribute to a violation of an air quality standard and that the Proposed Action would not adversely affect the attainment and maintenance of any NAAQS. A conformity applicability analysis must be completed for every DAF action that would be located in or include a nonattainment or maintenance area and that generates emissions to determine and document whether the Proposed Action complies with the General Conformity Rule. The analysis must consider the total direct and indirect emissions, including all emission increases and decreases that are practicably controllable through an agency's continuing program responsibility and that are reasonably foreseeable at the time that the conformity applicability analysis is conducted.

The first step in a conformity applicability analysis involves evaluating the total direct and indirect emissions caused by the Proposed

In the conformity applicability analysis, the emissions thresholds that trigger the conformity requirements are called *de minimis* thresholds. The net change emissions calculated for the direct and indirect emissions are compared to these thresholds. If the emissions are below *de minimis* thresholds, the proposed project is presumed to conform to the SIP. If the net change in emissions equals or exceeds the *de minimis* conformity applicability threshold values, then a formal Conformity Determination must be prepared to demonstrate conformity with the approved SIP. *De minimis* levels are shown in **Table 3-3**.

Table 3-3.
***De Minimis* Thresholds for Conformity Determinations**

Pollutant	Nonattainment or Maintenance Area Type	*De Minimis* Threshold (tpy)
Ozone (VOC or NO_x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO_x)	Marginal and moderate nonattainment inside an ozone transport region	100
Ozone (NO_x)	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
CO, SO_2, and NO_2	All nonattainment and maintenance	100
PM_{10}	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
$PM_{2.5}$	All nonattainment and maintenance	100
Lead	All nonattainment and maintenance	25

Source: 40 CFR 93.153
CO = carbon monoxide; NO_2 = nitrogen dioxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound

3.5.1.3 Hazardous Air Pollutants

In addition to the NAAQS for criteria pollutants, national standards exist for hazardous air pollutants, which are regulated under Section 112(b) of the 1990 CAA amendments.

Aircraft gas turbine engines burn fuel more efficiently than most mobile sources. Because most fuel is consumed at higher power settings and most operational time is spent at cruise, greater than 99 percent of fuel undergoes complete combustion and is efficiently converted to carbon dioxide and water. Hazardous air pollutant emissions are greatest under idle conditions, when the engines are operating in a less-efficient cycle.

3.5.1.4 Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. GHG emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere helps regulate the earth's temperature and contribute to global climate change. GHGs include water vapor, carbon dioxide, methane, nitrous oxide, ozone, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface. The global warming potential of a particular gas provides a relative basis for calculating its carbon dioxide equivalent, or the amount of carbon dioxide equivalent to the emissions of that gas. Carbon dioxide has a global warming potential of one and is, therefore, the standard by which all other GHGs are measured. The potential effects of proposed GHG emissions are by nature global and result in cumulative impacts because most individual anthropogenic sources of GHG emissions are not large enough to have a noticeable effect on climate change. Therefore, the impact of proposed GHG emissions to climate change is discussed in the context of cumulative impacts in **Section 3.5.3.6**.

3.5.2 Existing Conditions

3.5.2.1 Regional Climate

Colorado's climate maintains generally cool temperatures, sunny conditions and low precipitation, but with large seasonal cycles and dramatic day-to-day changes. Colorado's mid-latitude and mid-continental position, coupled with its rugged topography and high elevations, create highly variable seasonal and daily temperatures throughout the state. January tends to be the coldest month across the state, while July, or sometimes August, is usually the warmest, with average temperatures differing by 40 to 55 degrees Fahrenheit (°F) between the warmest and coldest months. There is a large range in the average annual precipitation across the state due various topographical features (CSU, 2024).

Kansas's annual mean temperatures range from around 58°F along the Oklahoma border to less than 52°F in the northwestern corner of the state. Annual precipitation, based on the 1991–2020 norm, vary from more than 45 inches in southeastern Kansas to less than 18 inches in southwestern Kansas. Highest normal annual snowfall ranges between 28 and 42 inches, while the lowest annual normal values are less than 12 inches (KSU, 2024).

The average temperatures of the earth's surface have increased by 1.6°F since 1900 and 0.8°F since 1980 due to increasing atmospheric concentrations of GHGs mainly from anthropogenic (man-made) influences—most likely from the combustion of fossil fuels. This warming trend is apparent in Colorado, where the statewide annual average temperatures over the past 30 years have increased by 2°F, with increases across all seasons: summer temperatures by 2.5°F, fall by 2.5°F, spring by 2.2°F, and winter by 1.6°F (CSU, 2024). In Kansas, temperatures have risen about 1.5°F since the beginning of the 20th century. Recent multi-year periods have been among some of the warmest on record for Kansas; comparable to the extreme heat of the Dust Bowl era of the 1930s, when intense drought and poor land management likely exacerbated the hot summer conditions. Many record-high temperatures were set during the summer of 2012, which was the hottest year on record, with an average temperature of 58.2°F. Recent spring

temperatures have been above average, which may have implications for crop planting. Summer temperatures have been near or above average since 2000 (NOAA, 2022).

3.5.2.2 Affected Environment

The ROI for criteria pollutants includes airspace in six Colorado counties (Baca, Bent, Cheyenne, Kiowa, Las Animas, and Prowers) and two Kansas counties (Morton and Stanton). Baca, Bent, Cheyenne, Kiowa, Las Animas, Morton, and Stanton are in attainment for all criteria pollutants.

A portion of Prowers County is listed as a maintenance area for PM_{10} (USEPA, 2024).

It should be noted that lead is a criteria pollutant and all affected counties are in attainment for the lead NAAQS. Lead was not included in the air quality analysis because there are no known sources of lead emissions associated with the Proposed Action.

Mixing height is another factor used in defining the ROI for various pollutants. The mixing height is the upper vertical limit of the volume of air in which emissions may affect air quality. Emissions released above the mixing height are typically restricted from affecting ground-level ambient air quality in the region, while emissions of pollutants released below the mixing height may affect ground-level concentrations. The portion of the atmosphere that is completely mixed begins at ground level and may extend up to heights of a few thousand feet. Mixing height varies from region to region based on daily temperature changes, amount of sunlight, and other climatic factors. The USEPA has defined a default mixing height as 3,000 feet AGL, which this EA used for the aircraft operations emissions analysis for criteria pollutants.

3.5.2.3 Analysis Methodology

Emissions sources and the approach used to estimate emissions under the Proposed Action for the air quality analysis were based on information from DAF subject matter experts and established aircraft operations.

The air quality analysis in this EA considered the aircraft operations below 3,000 feet AGL. Emission estimates were derived using the DAF's Air Conformity Applicability Model (ACAM) and include low-altitude flight in the proposed airspace. Aircraft emissions are based on operations data Altus AFB provided and represent the most recent data available on flight operations. These data were then input into ACAM to generate the total estimated annual emissions under the Proposed Action. Assumptions of the model, methods, and detailed summary results are provided in **Appendix C** of this EA.

3.5.3 Environmental Consequences

3.5.3.1 Evaluation Criteria

This analysis estimates direct and indirect emissions associated with the proposed alternatives and compares those emissions with the relevant pollution standards to assess the impact of potential increases in pollutant concentrations.

The air analysis for aircraft operations factors in the engine types used in the aircraft, specific engine power settings, the emission factors associated with those flight modes, and other relevant details. These data are then input into ACAM, which is used for the analysis of fixed-wing aircraft. ACAM (version 5.0.23a) provides estimated air emissions from proposed federal actions for fixed-wing aircraft for each specific criteria and precursor pollutant, as defined in the NAAQS. The air quality impacts analysis at the locations evaluated in this EA has factored in each mode of flight operations that occur at or below the mixing layer, which is defined as the default value of 3,000 feet AGL (USEPA, 1972).

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The CEQ defines significance

in terms of context and intensity in 40 CFR § 1508.27. This requires that the significance of an action be analyzed with respect to the setting of the action and be based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis used the USEPA's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the ROI is in attainment, the analysis compared the annual net increase in emissions estimated for Alternatives 1, 2, and 3 to the 250 tons per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant, the indication is the air quality impacts would not be significant for that pollutant.

As described above, a portion of Prowers County is currently designated as a maintenance area for PM_{10}. To assess the applicability of General Conformity to the Proposed Action, the General Conformity Rule *de minimis* threshold of 100 tons per year was used as the *de minimis* threshold for PM_{10} within Prowers County.

The air quality analysis assumes that the proposed utilization of MTR IR-177 would be fully operational by January 2025, allowing for steady-state operations for that calendar year.

3.5.3.2 Alternative 1

Alternative 1 would lower and standardize the floor elevation of IR-177 to 300 feet AGL, and the MTR would remain in its current configuration. Unused portions of the legacy IR-177 MTR would remain inactive under this alternative.

Table 3-4 provides estimated air emissions of criteria pollutants under Alternative 1. Alternative 1 estimates represent emissions from the proposed low-altitude aircraft operations. For PM_{10} within Prowers County, estimated emissions are evaluated against the *de minimis* threshold of 100 tons per year. For all other counties and criteria pollutants, estimated emissions are evaluated against the PSD major source comparative indicator thresholds.

For PM_{10} within Prowers County, emissions would increase under Alternative 1 but the proposed changes would be less than the *de minimis* threshold. For all other counties and criteria pollutants, emissions would increase under Alternative 1 within the affected counties, but the proposed changes would be less than the comparative indicator. Therefore, the increases in these pollutant emissions would not be significant.

3.5.3.3 Alternative 2

Under Alternative 2, the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1. Alternative 2 also would propose the same training activities and annual sorties as Alternative 1. As under Alternative 1, unused portions of the legacy IR-177 MTR would remain inactive under Alternative 2. While Alternative 2 would not standardize IR-177 to 300 feet AGL, the legacy floor altitude for the MTR would still be at or below the mixing layer of 3,000 feet AGL. Therefore, this analysis conservatively assumes that emissions under Alternative 2 would equal those under Alternative 1, and the results presented in **Table 3-4** also represent emissions under Alternative 2.

Therefore, under Alternative 2, for PM_{10} within Prowers County, emissions would increase but the proposed changes would be less than the *de minimis* threshold. For all other counties and criteria pollutants, emissions would increase under Alternative 2 within the affected counties, but the proposed changes would be less than the comparative indicator. Therefore, the increases in these pollutant emissions would not be significant.

Table 3-4.
Criteria Pollutant Emission Estimates – Alternatives 1 and 2

Location	Total Annual Emissions in Tons					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Colorado Counties						
Baca	0.20	1.24	125.91	4.12	8.88	7.99
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Bent	0.17	1.06	107.77	3.53	7.60	6.84
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Cheyenne	0.12	0.76	77.10	2.52	5.44	4.89
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Kiowa	0.17	1.09	110.66	3.62	7.80	7.02
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Las Animas	0.01	0.06	5.61	0.18	0.40	0.36
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Prowers	0.15	0.94	95.68	3.13	6.74	6.07
Applicable *de minimis* or PSD major source comparative threshold	250	250	250	250	100	250
Exceeds threshold?	No	No	No	No	No	No
Kansas Counties						
Morton	0.07	0.42	42.93	1.41	3.03	2.73
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Stanton	0.04	0.25	25.76	0.84	1.82	1.64
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No

CO = Carbon monoxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns; PM_{10} = particulate matter less than or equal to 10 microns; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

3.5.3.4 Alternative 3 (Preferred Alternative)

Alternative 3 would be similar to Alternative 1. However, Alternative 3 would modify the legacy route segment between J1 and K to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre NHS while avoiding Eads Municipal Airport by 3 nm.

Table 3-5 provides estimated air emissions of criteria pollutants under Alternative 3. Alternative 3 estimates represent emissions from the proposed low-altitude aircraft operations. For PM_{10} within Prowers County, estimated emissions are evaluated against the *de minimis* threshold of 100 tons per year. For all other counties and criteria pollutants, estimated emissions are evaluated against the PSD major source comparative indicator thresholds.

Table 3-5.
Criteria Pollutant Emission Estimates– Alternative 3

Location	Total Annual Emissions in Tons					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Colorado Counties						
Baca County	0.20	1.24	125.92	4.12	8.88	7.99
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Bent County	0.17	1.06	107.78	3.53	7.60	6.84
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Cheyenne County	0.12	0.73	74.49	2.44	5.25	4.73
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Kiowa County	0.19	1.20	121.63	3.98	8.57	7.72
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Las Animas County	0.01	0.06	5.61	0.18	0.40	0.36
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Prowers County	0.15	0.94	95.43	3.12	6.73	6.06
Applicable *de minimis* or PSD major source comparative threshold	250	250	250	250	100	250
Exceeds threshold?	No	No	No	No	No	No
Kansas Counties						
Morton County	0.07	0.42	42.94	1.41	3.03	2.73
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Stanton County	0.04	0.25	25.76	0.84	1.82	1.64
PSD major source comparative threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No

CO = Carbon monoxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns; PM_{10} = particulate matter less than or equal to 10 microns; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

For PM_{10} within Prowers County, emissions would increase under Alternative 3, but the proposed changes would be less than the *de minimis* threshold. For all other counties and criteria pollutants, emissions would increase under Alternative 3 within the affected counties, but the proposed changes would be less than the comparative indicator. Therefore, the increases in these pollutant emissions would not be significant.

3.5.3.5 No Action Alternative

Under the No Action Alternative, utilization and standardization of the floor of IR-177 would not occur. There would be no change to air quality conditions in the ROI beyond baseline conditions. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.5.3.6 Cumulative Impacts

The Proposed Action, in addition to past, present, and reasonably foreseeable actions within the ROI, would increase emissions, but the combined impacts are unlikely to result in an exceedance of the NAAQS. The Cannon AFB utilization of IR 500 and 501 would occupy portions of the same airspace as IR-177 in southeastern Colorado, although the anticipated utilization of those IRs is not currently known so contributions to overall emissions cannot be estimated at this time. The Cougar MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace. When considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, no significant cumulative impacts to air quality would be anticipated to occur with implementation of the Proposed Action.

Cumulative Impacts from GHGs

For GHGs, the ROI is global and impacts are cumulative by nature. As stated in **Section 2.1.1**, there would be no new operations at Altus AFB under the Proposed Action. Utilization of IR-177 would require a longer flight from Altus AFB to reach the reactivated MTR as compared to the current MTRs in use. Therefore, there would be an increase in overall GHG emissions with implementation of the Proposed Action.

The cumulative analysis evaluates GHG emissions considering the existing conditions and the proposed alternatives. Implementation of either alternative would contribute directly to emissions of GHGs from the combustion of fossil fuels. **Table 3-6** shows the annual GHG emissions for Alternatives 1, 2 and 3**.** The GHG analysis assumes the "worst-case" scenario of all sorties being diverted from IR-193, located approximately 22.16 nm from Altus AFB. These worst-case emissions are shown under the No Action Alternative and used to obtain a net increase in GHG emissions for sorties that would utilize IR-177, located approximately 193.17 nm from Altus AFB. These estimates were prepared to provide a measure of the worst-case difference among the alternatives. The Proposed Action would increase GHG emissions across all the action alternatives compared to the No Action Alternative. Alternatives 1 and 2 would generate slightly less GHG emissions compared to Alternative 3.

Table 3-6.
Annual Greenhouse Gas Emissions for the Project Alternatives

Activity	CO_2 (metric ton)	CH_4 (metric ton)	N_2O (metric ton)	Total CO_2e (metric ton)
No Action Alternative	4,708	0.20	0.04	4,724
Alternatives 1 and 2	93,654	3.94	0.77	93,981
Net Increase under Alternatives 1 and 2	88,946	3.74	0.73	**89,257**
Alternative 3	94,379	3.97	0.78	94,709
Net Increase under Alternative 3	89,671	3.77	0.74	**89,985**

CO = carbon dioxide; CO_2e = carbon dioxide equivalent; CH_4 = methane; NO_2 = nitrogen dioxide

Calculating the social costs of carbon dioxide, methane, and nitrous oxide allows agencies to understand the benefits of reducing each of these GHGs, or the social costs of increasing such emissions, in the decision-making process. Collectively, these are referenced as the social cost of GHG emissions (SC-GHG) and is defined as the monetary value of the net harm to society associated with adding a small amount of carbon to the atmosphere in a given year. In principle, net harm cost includes the value of all climate change impacts, including but not limited to changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services (Interagency Working Group, 2021). The SC-GHG is the theoretically appropriate value to use when conducting cost-benefit analyses of policies that affect GHG emissions. In practice, data and modeling limitations restrain the ability of SC-GHG estimates to include all physical, ecological, and economic impacts of climate change, implicitly assigning a value of zero to the omitted climate damages. The estimates are, therefore, a partial accounting of climate change impacts and likely underestimate the marginal benefits of abatement (USEPA, 2023). For this analysis, only the social cost of carbon dioxide ($SC\text{-}CO_2$) is evaluated, as the vast majority of emissions is generated by aircraft flying with turbofan engines. These engines generate no methane emissions and very little nitrous oxide emissions. Quantifying the small quantity of nitrous oxide emissions is a current subject of research.

Action-related $SC\text{-}CO_2$ were estimated by calendar year for the projected action's lifecycle from 2025 through 2046. **Table 3-7** denotes the damage value of 1 metric ton of carbon dioxide based on 2020 dollars, and on a 2.5-percent cost basis for each year of the project lifecycle (Interagency Working Group, 2021). **Table 3-8** identifies the projected cost of implementing Alternatives 1 and 2. **Table 3-9** presents the same costs for Alternative 3. For a more detailed presentation of the DAF approach to the SC-GHG analysis, the full ACAM report is included in **Appendix C**.

The monetary cost of climate change damages associated with the increase in GHG emissions generated during the 20-year period under the Proposed Action would be larger under Alternative 3 when compared to Alternatives 1 and 2 due to the slightly increased emissions under Alternative 3.

Table 3-7.
SC-GHG Yearly Estimates at 2.5% Cost Basis

Year	SC-CO_2 Estimates (2020$/metric ton @ 2.5% Average Damages)
2025	$83.00
2026	$84.00
2027	$86.00
2028	$87.00
2029	$88.00
2030	$89.00
2031	$91.00
2032	$92.00
2033	$94.00
2034	$95.00
2035	$96.00
2036	$98.00
2037	$99.00
2038	$100.00
2039	$102.00
2040	$103.00
2041	$104.00
2042	$106.00
2043	$107.00
2044	$108.00
2045	$110.00
2046	$111.00

Source: ACAM version 5.0.23a

Table 3-8.
SC-GHG Yearly Emissions Estimates – Alternatives 1 and 2

Year	Alternative 1 and 2 Annual Net Change CO_2 Emissions (metric tons)	SC-GHG Emissions 2020$ – 2.5% Average Discount, Average Damages for Individual Year
2025	88,946	$7,382.54
2026	88,946	$7,471.48
2027	88,946	$7,649.38
2028	88,946	$7,738.32
2029	88,946	$7,827.27
2030	88,946	$7,916.21
2031	88,946	$8,094.11
2032	88,946	$8,183.05
2033	88,946	$8,360.95
2034	88,946	$8,449.89
2035	88,946	$8,538.84
2036	88,946	$8,716.73
2037	88,946	$8,805.68
2038	88,946	$8,894.62
2039	88,946	$9,072.52
2040	88,946	$9,161.46
2041	88,946	$9,250.41
2042	88,946	$9,428.30
2043	88,946	$9,517.25
2044	88,946	$9,606.19
2045	88,946	$9,784.09
2046	88,946	$9,873.03
Total cost over 20 years:		**$189,722.32**

Table 3-9.
SC-GHG Yearly Emissions Estimates – Alternative 3

Year	Alternative 3 Annual Net Change CO_2 Emissions (metric tons)	SC-GHG Emissions 2020$ – 2.5% Average Discount, Average Damages for Individual Year
2025	89,671	$7,442.70
2026	89,671	$7,532.37
2027	89,671	$7,711.71
2028	89,671	$7,801.38
2029	89,671	$7,891.06
2030	89,671	$7,980.73
2031	89,671	$8,160.07
2032	89,671	$8,249.74
2033	89,671	$8,429.08
2034	89,671	$8,518.75
2035	89,671	$8,608.42
2036	89,671	$8,787.77
2037	89,671	$8,877.44
2038	89,671	$8,967.11
2039	89,671	$9,146.45
2040	89,671	$9,236.12
2041	89,671	$9,325.79
2042	89,671	$9,505.14
2043	89,671	$9,594.81
2044	89,671	$9,684.48
2045	89,671	$9,863.82
2046	89,671	$9,953.49
Total Cost Over 20 Years		**$191,268.43**

3.6 OPERATIONAL NOISE

3.6.1 Existing Conditions

3.6.1.1 Definition of Resource

Noise is considered unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Sound is intermittent or continuous, steady or impulsive. It may also be stationary or transient. Stationary sources of sound are normally related to specific land uses, such as an amusement park or industrial plants. Transient sound sources move through the environment, either along relatively established paths (e.g., highways, railroads, and aircraft flight tracks around airports) or randomly. There is wide diversity in responses to sound that not only vary according to the type of sound and the characteristics of the source, but also according to the sensitivity and expectations of the receptor, the time of day, and the distance between the source (e.g., an aircraft) and the receptor (e.g., a person or animal).

The physical characteristics of sound include its intensity, frequency, and duration. Sound is created by acoustic energy, which produces minute pressure waves that travel through a medium, like air or water,

and are sensed by the eardrum. This may be likened to the ripples in water that would be produced when a stone is dropped into it. As the acoustic energy increases, the intensity or amplitude of these pressure waves increases, and the ear senses louder sound. The unit used to measure the intensity of sound is the decibel (dB). Sound intensity varies widely (from a soft whisper to a jet engine) and is measured on a logarithmic scale to accommodate this wide range. Human hearing ranges from 0 dB (barely audible) to 120 dB, where physical discomfort is caused by the sound.

The frequency of sound is measured in cycles per second, or hertz (Hz). This measurement reflects the number of times per second the air vibrates from the acoustic energy. Low-frequency sounds are heard as rumbles or roars, and high-frequency sounds are heard as screeches. Sound measurement is further refined through the use of "weighting." The average human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz. However, not all sounds throughout this range are heard equally well. Because the human ear is most sensitive to frequencies in the 1,000–4,000 Hz range, sound meters may be calibrated to emphasize frequencies in this range. Sounds measured with these instruments are termed "A-weighted," and are indicated in terms of A-weighted decibels. A-weighting simply accounts for the frequency sensitivity of the human ear. In this EA, because the use of A-weighting is understood, the "A-weighted" designation is omitted and the unit dB used.

Military aircraft generate two general types of sound. One is subsonic, which is continuous sound generated both by the aircraft's engines and by air flowing over the aircraft itself. Subsonic sound is generated at airfields any time the aircraft is flying or if the engines are running on the ground, as well as in-flight in training airspace. The other type is supersonic sound, which can manifest in sonic booms if there are aircraft operating at supersonic speeds under certain conditions. Under the Proposed Action, there would not be supersonic flight; thus, there would not be sonic booms.

Federal, state, and local governments regulate sound to prevent noise sources from affecting noise-sensitive areas, such as residences, hospitals, and schools, and to protect human health and welfare. Federal agencies, such as the Department of Housing and Urban Development, have established health-based maximum sound exposure recommendations. Local agencies, including cities and counties, are responsible for defining and enforcing land use compatibility in various noise environments.

The ROI for operational noise includes the land under the proposed IR-177 (see **Figures 2-2** and **2-3**).

3.6.1.2 Noise Metrics

The word "metric" is used to describe a standard of measurement. Many different types of sound metrics have been developed by researchers attempting to represent the effects of operational noise. Each metric used in operational noise analysis has a different physical meaning or interpretation. The primary metrics supporting the assessment of operational noise from aircraft operations in this EA are Sound Exposure Level (SEL), Day-Night Average Sound Level (DNL) and Onset Rate-Adjusted Day-Night Average Sound Level (L_{dnmr}).

DNL is an A-weighted cumulative noise metric that measures noise based on annual average daily aircraft operations. When DNL is calculated over a busy month of operations (as opposed to an average month) and when a further adjustment is made to penalize for the "surprise factor" caused by fast-moving, low-altitude aircraft, the metric is called L_{dnmr}. This onset-rate adjustment "penalizes" the noise value by up to 11 dB, depending on the rapidity of the rise in noise. Adjustments are greater for aircraft flying at lower altitudes and higher speeds. DoD uses the busy month standard to characterize the impact that occurs as a result of the cyclic nature of training, where certain military training exercises may be very intense at some times and non-existent at other times. The DoD uses L_{dnmr} as the standard metric for assessing aircraft noise in training airspace for this reason and also to account for the onset rate, especially for low-altitude tactical aircraft. The FAA standard for assessing aircraft noise is DNL. Because this noise study is in support of an EA that will be considered both by the DAF and the FAA, both metrics are calculated and presented.

The DNL and L_{dnmr} metrics have two distinct acoustical time periods of interest: daytime and nighttime. Daytime hours are from 7:00 a.m. to 10:00 p.m. local time. Nighttime hours are from 10:00 p.m. to 7:00 a.m. local time. The DNL weights operations occurring during its nighttime period by adding or applying a 10-dB increase to each single event. Note that "daytime" and "nighttime" in calculation of DNL are sometimes referred to as "acoustic day" and "acoustic night" and always correspond to the times given above. This is often different than "day" and "night" used commonly in military aviation, which are directly related to the times of sunrise and sunset and vary throughout the year with the seasonal changes.

3.6.1.3 Baseline Conditions

The existing conditions for the ROI include sparsely inhabited land below IR-177 and MOAs within and near IR-177. These MOAs include the Cougar, Two Buttes, and Mt. Dora North airspaces. Though noise from aircraft activities is generated within these MOAs, the MOAs would not be modified as a part of the Proposed Action and their noise levels were not modeled.

Table 3-10 lists the American National Standards Institute (ANSI) standard land use areas and the expected standard background noise levels. These annual average background noise levels are based on measurements.

Table 3-10.
Estimated Background Noise Levels

Example Land Use Category	Average Residential Intensity (people per acre)	DNL (dBA)
Rural or remote areas	<2	<49
Quiet suburban residential	2	49
	4	52
	4.5	52
Quiet commercial, industrial, and normal urban residential	9	55
	16	58
	20	59

Source: ANSI, 2013
dBA = A-weighted decibel; DNL = Day-Night Average Sound Level

Figure 3-2 displays avoidance areas in the vicinity of IR-177. These avoidance areas include sites such as antennas, cattle yards, farms, residences, and silos. Residences are considered noise-sensitive receptors.

The current baseline condition for IR-177 is non-use. IR-177 was previously authorized for B-1 bomber aircraft training, but this training has not occurred for approximately a decade.

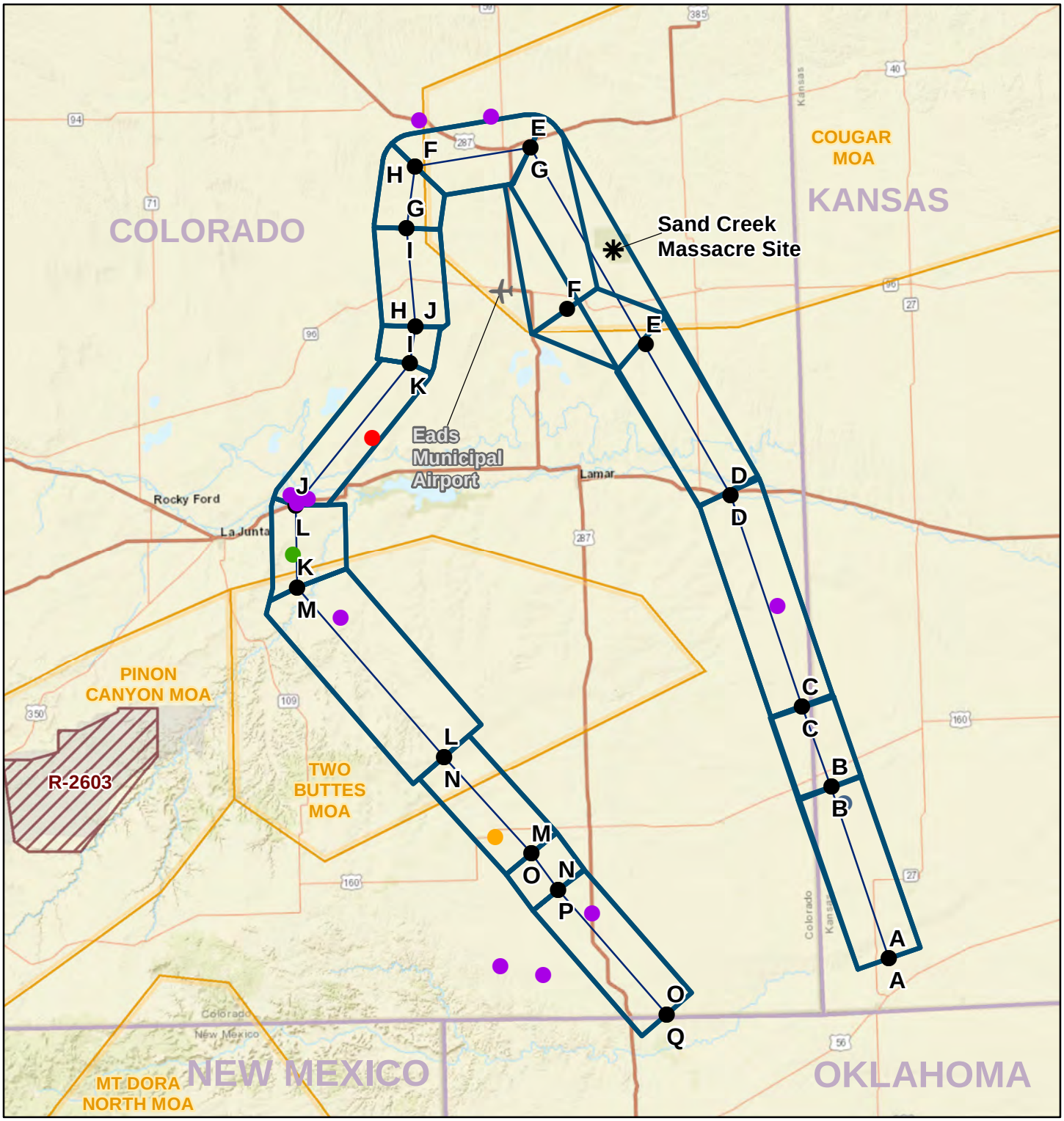


FIGURE 3-2

Avoidance Areas in the Vicinity of IR-177

- Antenna
- Cattle Yard
- Farm
- IR-177 Waypoints
- Residence
- Sand Creek Massacre Site
- Silo
- Military Operations Areas
- Restricted Airspace
- IR-177 Proposed Airspace to Retain

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

3.6.2 Environmental Consequences

3.6.2.1 Evaluation Criteria

A noise impact analysis typically evaluates potential changes to existing noise environments that would result from implementation of the Proposed Action. As described in **Chapter 2**, the alternatives consist of various configurations of the IR-177 MTR, including the No Action Alternative.

The following types of noise changes are specified in FAA Order 1050.1f as changes that should be reported for aviation activities:

- For DNL 65 dB and higher, a 1.5-dB increase is reportable;
- For DNL 60 dB to less than 65 dB, a 3-dB increase is reportable; and
- For DNL 45 dB to less than 60 dB, a 5 dB increase is reportable.

3.6.2.2 Noise Modeling Process

The DoD prescribes use of the NOISEMAP suite of computer programs containing the core computational programs called "NMAP," version 7.3, and "MRNMap," version 3.0 for environmental analysis of aircraft noise. For this EA, the NOISEMAP suite of programs refers to Base Operations as the input module and MRNMap as the noise model used to predict noise exposure in the proposed SUA. Due to limitations in the MRNMap's calculation of very low noise levels, all cumulative noise results below 45 dB DNL/L_{dnmr} are reported as "<45 dB."

Table 2-1 displays the proposed annual flight operations for IR-177 as provided by the 97 AMB and the 140th Wing. Transient aircraft are also expected to use IR-177. All transient fighters are modeled as F-16C craft and all transient cargo or heavy aircraft are modeled as C-17 craft. Fighter aircraft would fly at airspeeds of approximately 500 knots and cargo/heavy aircraft would fly at airspeeds between 130 and 310 knots while using the MTR. **Appendix D** provides more detail on the noise modeling process.

Table 3-11 displays the calculated SEL for F-16, C-17, and B-1 aircraft using NOISEMAP. B-1 airspeed and power settings were taken from a previous EA (Supplement to Environmental Assessment for Olive Branch Routes (IR-177 and IR-501), 1985). Note that the SEL values in **Table 3-11** each represent the noise exposure for a single aircraft flyby.

Table 3-11.
Sound Exposure Levels

Lateral Distance	SEL (dB) at 500 ft AGL		
	F-16	C-17	B-1
1,000	110	97	97
1,500	106	92	93
2,000	103	88	90
2,500	101	86	88
3,000	99	83	86

AGL = above ground level; dB = decibel; ft = feet; SEL = sound exposure level

3.6.2.3 Alternative 1

Alternative 1 would lower and standardize the floor elevation of IR-177 to 300 feet AGL, the MTR would remain in its current configuration, and the segment names would be updated. Unused portions of the legacy IR-177 MTR would remain inactive under Alternative 1. **Table 3-12** displays the noise results for Alternative 1. The noise levels presented are the maximum levels beneath each segment of the MTR due

to aircraft operations. Note that the DNL and L_{dnmr} noise levels were found to be identical for all alternatives examined. Under Alternative 1, areas below IR-177 would experience cumulative noise levels between 49 and 52 dB DNL/L_{dnmr} for the majority of the length of the MTR. Beneath the final segments, noise levels are estimated to be less than 45 dB DNL/L_{dnmr}. **Table 3-13** lists the calculated noise values for residences near the IR. Residences would be exposed to noise levels up to 54 dB DNL/L_{dnmr}.

Table 3-12.
IR-177 Noise Levels – Alternative 1

Segment	DNL/L_{dnmr} (dB)
A–B	52
B–C	52
C–D	52
D–E	50
E–F	50
F–G	50
G–H	52
H–I	52
I–J	52
J–K	49
K–L	50
L–M	<45
M–N	<45
N–O	<45

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

Table 3-13.
Noise Levels at Residences

Residence	DNL/L_{dnmr} (dB)		
	Alternative 1	Alternative 2	Alternative 3
R-1	53	52	51
R-2	50	49	48
R-3	<45	<45	<45
R-4	<45	<45	<45
R-5	<45	<45	<45
R-6	51	<45	49
R-7	<45	<45	<45
R-8	54	53	52
R-9	50	49	49
R-10	<45	<45	<45

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

Historically, IR-177 was used for aircraft training but has been inactive for approximately a decade. The exact numbers of aircraft operations for the MTR's historic usage is not available; however, these aircraft would have exposed the areas below IR-177 to military aircraft noise. For single flyby operations, F-16 events are louder than historic B-1 events. C-17 events are slightly quieter than historic B-1 events.

The modeled cumulative noise levels under Alternative 1 are 52 dB DNL/L_{dnmr} or less, which corresponds to an increase of 3 dB or greater compared to the baseline estimates. As the increase in noise could be greater than 5 dB in some areas (including at noise-sensitive residences), this is a reportable increase under FAA criteria. It is expected that the impacts of operational noise under Alternative 1 would be less than significant.

3.6.2.4 Alternative 2

Under Alternative 2, the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1. **Table 3-14** displays the noise results for Alternative 2. The noise levels presented are the maximum levels beneath each segment of the MTR due to aircraft operations. Note that the DNL and L_{dnmr} noise levels were found to be identical for all alternatives examined. Under Alternative 2, areas below IR-177 would experience cumulative noise levels between 49 and 52 dB DNL/L_{dnmr} for the majority of the length of the MTR. Beneath the ending segments, noise levels are estimated to be less than 45 dB DNL/L_{dnmr}. See **Table 3-13** above for the calculated noise values for residences near the IR. Residences would be exposed to noise levels up to 53 dB DNL/L_{dnmr}.

Table 3-14.
IR-177 Noise Levels – Alternative 2

Segment	DNL/L_{dnmr} (dB)
A–B	<45
B–C	<45
C–D	50
D–E	49
E–F	51
F–G	49
G–H	50
H–I	52
I–J	52
J–K	50
K–L	<45
L–M	<45
M–N	<45
N–O	<45

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

Historically, IR-177 was used for aircraft training but has been inactive for approximately a decade. The exact numbers of aircraft operations for the MTR's historic usage is not available; however, these aircraft would have exposed the areas below IR-177 to military aircraft noise. For single flyby operations, F-16 events are louder than historic B-1 events. C-17 events are slightly quieter than historic B-1 events.

The modeled cumulative noise levels under Alternative 2 are 52 dB DNL/L_{dnmr} or less, which corresponds to an increase of 3 dB or greater compared to the baseline estimates. As the increase in noise could be greater than 5 dB in some areas (including at noise-sensitive residences), this is a reportable increase under FAA criteria. It is expected that the impacts of operational noise under Alternative 2 would be less than significant.

3.6.2.5 Alternative 3 (Preferred Alternative)

Alternative 3 would be similar to Alternative 1; however, Alternative 3 would modify the legacy route segments to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre NHS while avoiding Eads Municipal Airport by 3 nm. This MTR modification would have a proposed lowest altitude of 300 feet AGL and a proposed highest altitude of 7,000 MSL. **Table 3-15** displays the noise results for Alternative 3. The noise levels presented are the maximum levels beneath each segment of the MTR due to aircraft operations. Note that the DNL and L_{dnmr} noise levels were found to be identical for all alternatives examined. Under Alternative 3, areas below IR-177 would experience cumulative noise levels between 49 and 51 dB DNL/L_{dnmr} for the majority of the length of the MTR. Beneath the final segments, noise levels are estimated to be less than 45 dB DNL/L_{dnmr}. See **Table 3-13** above for the calculated noise values for residences near the IR. Residences would be exposed to noise levels up to 52 dB DNL/L_{dnmr}.

Historically, IR-177 was used for aircraft training but has been inactive for approximately a decade. The exact numbers of aircraft operations for the MTR's historic usage is not available; however, these aircraft would have exposed the areas below IR-177 to military aircraft noise. For single flyby operations, F-16 events are louder than historic B-1 events. C-17 events are slightly quieter than historic B-1 events.

The modeled cumulative noise levels under Alternative 3 are 51 dB DNL/L_{dnmr} or less, which corresponds to an increase of 2 dB or greater compared to the baseline estimates. As the increase in noise could be greater than 5 dB in some areas, (including at noise-sensitive residences), this is a reportable increase under FAA criteria. It is expected that the impacts of operational noise under Alternative 3 would be less than significant.

Table 3-15.
IR-177 Noise Levels – Alternative 3

Segment	DNL/L_{dnmr} (dB)
A–B	51
B–C	51
C–D	51
D–E	51
E–F	51
F–G	50
G–H	50
H–I	50
I–J	50
J–K	51
K–L	51
L–M	51
M–N	49
N–O	50
O–P	<45
P–Q	<45

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

3.6.2.6 No Action Alternative

Under the No Action Alternative, the IR-177 would not be utilized or reconfigured. There would be no change to the noise environment in the ROI beyond baseline conditions. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.6.2.7 Cumulative Impacts

Cumulative impacts to noise from the Proposed Action would be minor. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR-500 and 501 would occupy much of the same airspace as IR-177 in southeastern Colorado. The anticipated utilization of those IRs is not currently known, and the potential exists for minor impacts to the noise environment, depending on the extent of proposed utilization. The Cougar MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace. Per the 2013 EA for Modification of the Cheyenne Low and High Military Operations Areas, noise levels due to aircraft operations within the Cougar MOA are <45 dB L_{dnmr}. When considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, no significant cumulative impacts to operational noise would be anticipated to occur with implementation of the Proposed Action.

3.7 CULTURAL RESOURCES

3.7.1 Definition of the Resource

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and EOs including the *Archaeological and Historic Preservation Act of 1960*, as amended (54 USC § 300101 et seq.), the *American Indian Religious Freedom Act of 1978* (42 USC § 1996), the *Archaeological Resources Protection Act of 1979*, as amended (16 USC §§ 470aa–470mm), the *Native American Graves Protection and Repatriation Act of 1990* (25 USC §§ 3001–3013), the NHPA, as amended through 2016, and associated regulations (36 CFR Part 800). The NHPA requires federal agencies to consider effects of federal undertakings on historic properties prior to deciding or taking an action and integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the NHPA Section 106 consultation process, as set forth in 36 CFR Part 800. NHPA Section 106 also requires agencies to consult with federally recognized American Indian tribes with a vested interest in the undertaking. NHPA Section 106 requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects to historic properties (36 CFR § 800.1(a)).

Cultural resources include the following subcategories:

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

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

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

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

For cultural resources analyses, the ROI is defined by the Area of Potential Effects (APE). The APE is defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist," (36 CFR § 800.16(d)) and thereby diminish their historic integrity. The APE encompasses direct and indirect effects for the Proposed Action and includes the area beneath the proposed IR-177 MTR.

3.7.2 Existing Conditions

The aerial extent of the alternatives (as the APE) ranges from 2,195 to 2,721 square miles outside of the bounds of Altus AFB. The proposed IR-177 MTR is located across 11 counties in Kansas, Colorado, and Oklahoma (see **Table 3-10** in **Section 3.10**). The legacy, or current, IR-177 MTR encompasses 7,381 square miles and includes the same 11 counties as well as Lincoln County (Colorado), Dallam County (Texas), and Union County (New Mexico). Information on cultural resources within the APE was obtained from several sources in March 2024, including the NRHP spatial database maintained by NPS, the Kansas Historical Society Archaeological Inventory (KHSAI), Kansas Historic Resources Inventory, and Compass, the State of Colorado's Online Cultural Resource and Paleontological Database. Aircraft operations are most likely to affect historic buildings, structures, landscapes, and districts where setting is an important aspect of a property's significance and where overpressures from sonic booms pose potential effects to those types of resources.

On 23 February 2024, the DAF sent coordination letters to the SHPOs of Oklahoma, Colorado, Kansas, Texas, and New Mexico and to NPS Regions 5, 6, 7, and 8. Government-to-government coordination was initiated with the Native American tribes and Pueblos located beneath or near the affected airspace or that may have traditional ties to these lands. The New Mexico State Historic Preservation Division responded to the coordination letter affirming its desire to participate as a consulting party for the Proposed Action. The Texas Historical Commission responded that its further participation in consultation is not necessary. No additional responses have been received at this time. Copies of such consultation letters and responses received are provided in **Appendix A**.

3.7.2.1 Architectural Resources

As of March 2024, there were 53 previously recorded architectural resources beneath the various configurations of IR-177 MTR. Three of these resources are listed on the NRHP (**Table 3-16**).

Table 3-16.
NRHP-Listed Architectural Resources Within the APE

Name	Description	Location	NRHP Status
Granada Bridge	Steel stringer bridge on US-385 across Arkansas River built in 1949	Prowers County, Colorado	Listed, 2002
Stonington First Methodist-Episcopal Church	Late Gothic Revival style church built in 1917	Baca County, Colorado	Listed, 1996
Morton County Work Progress Administration Bridge	Stone multi-arch bridge built from 1936 to 1939	Morton County, Kansas	Listed, 1986

APE = Area of Potential Effect; NRHP = National Register of Historic Places

3.7.2.2 Archaeological Resources

As of March 2024, there were 533 archaeological resources beneath the various configurations off IR-177 MTR. Of these sites, four are listed on the NRHP and five are eligible for listing (**Table 3-17**). An additional seven archaeological resources are designated as "potentially eligible" in the KHSAI.

Table 3-17.
NRHP-Eligible and -Listed Archaeological Resources Within the APE

Name	Description	Location	NRHP Status
Sand Creek Massacre National Historic Site	Arapaho and Cheyenne massacre site (1864)	Kiowa County, Colorado	Listed, 2001
Amache National Historic Site (also known as Grenada Relocation Center and Camp Amache)	WWII Japanese internment camp	Prowers County, Colorado	Listed, 1994
Santa Fe Trail – Cimarron National Grassland Segment 3	Early 19th century transportation route	Morton County, Kansas	Listed, 2013
Santa Fe Trail – Cimarron National Grassland Segment 4	Early 19th century transportation route	Morton County, Kansas	Listed, 2013
Santa Fe Trail Site 1 (14MT1146)	Early 19th century transportation route	Morton County, Kansas	Eligible, 2015
Santa Fe Trail Site 2 (14MT1147)	Early 19th century transportation route	Morton County, Kansas	Eligible, 2015
Santa Fe Trail Site 3 (14MT1148)	Early 19th century transportation route	Morton County, Kansas	Eligible, 2015
Santa Fe Trail Site 4 (14MT1149)	Early 19th century transportation route	Morton County, Kansas	Eligible, 2015
Santa Fe Trail Site 5 (14MT11150)	Early 19th century transportation route	Morton County, Kansas	Eligible, 2015

APE = Area of Potential Effect; NRHP = National Register of Historic Places

Sand Creek Massacre NHS is the location of one of the most controversial events in American history. In May 2013, a proposed action at Cheyenne and Cougar MOA for the 140th Wing of the Colorado ANG involved the Sand Creek NHS (DAF, 2013). As a result of the consultation for the 2013 undertaking, the FONSI detailed the following conditions and measures to reduce the potential impacts to Native American resources (DAF, 2013):

- The 140 WG would suspend flights over the Sand Creek Massacre NHS during tribal ceremonies with advance notice of the date, time, and location of such ceremonies;
- The 140 WG would restrict flights below 5,000 feet AGL within a 5 nm radius of the Sand Creek Massacre NHS marker, and no flights over the site would be armed.

Through the NHPA Section 106 process, the Colorado ANG established and charted the Sand Creek Massacre NHS avoidance area. In a letter dated 25 May 2012, the NPS indicated that a buffer should provide a level of mitigation and resource protection consistent with the Sand Creek Massacre NHS designation. As published in FAA JO 7400.10F, a 5-nm radius, 5,000-AGL avoidance bubble exists across the existing IR-177 MTR.

Amache NHS, also known as "Granada Relocation Center" and "Camp Amache." also involves controversial events in American history. In March 2022, the *Amache National Historic Site Act* was signed into law and designated the Amache NHS as a National Historic Landmark under the National Park System. The Amache NHS is one of six sites in the National Park System that recognizes this chapter of American history (NPS, 2024b). Note that the Amache NHS is not fully encompassed by the APE. The western boundary of the APE nearly bisects the Amache NHS boundary, and the western half of Amache NHS is not within the APE. The APE covers 293 acres of the 640-acre Amache NHS boundary.

Santa Fe National Historic Trail was a major trade and travel route between 1821 and 1846 that extended from Old Franklin, Missouri, to Santa Fe, New Mexico. Cimmaron National Grassland contains 23 miles of the Santa Fe Trail; Segments 3 and 4 are located within the APE. As can be seen in **Table 3-17** above, there are five NRHP-eligible sites within the APE associated with Santa Fe National Historic Trail. The NRHP-listed segments of the trail are significant for their roles in transportation and commerce during this period (Criterion A) and for the trail's yielding or potential to yield important information in history (Criterion D).

3.7.2.3 Historic District Resources

As of March 2024, there was one historic district resource within the APE listed on the NRHP (**Table 3-18**).

Table 3-18.
NRHP-Listed Historic District Within the APE

Name	Description	Location	NRHP Status
Point of Rocks-Middle Spring Santa Fe Trail Historic District	Cliff, spring, and Santa Fe Trail segments	Morton County, Kansas	Listed, 2013

Point of Rocks-Middle Spring Santa Fe Trail Historic District was listed on the NRHP in 2013 and includes a cliff, a spring, and four segments of the Santa Fe National Historic Trail. Point of Rocks represents the third highest point in the state of Kansas with an elevation of 3,540 feet above MSL.

3.7.2.4 Traditional Cultural Properties

In accordance with Section 106 of the NHPA, DoDI 4710.02, and DAFI 90-2002, the DAF initiated informal consultation with the following 23 Tribal Historic Preservation Officers and tribal leaders of federally recognized Native American tribes to identify TCPs that could be affected by the Proposed Action:

- Apache Tribe of Oklahoma
- Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation, Montana
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Cheyenne and Arapaho Tribes
- Tao Pueblo

- Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota
- Comanche Nation of Oklahoma
- Eastern Shoshone Tribe of the Wind River Reservation, Wyoming
- Flandreau Santee Sioux Tribe of South Dakota
- Jicarilla Apache Nation
- Kiowa Tribe
- Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation
- Oglala Sioux Tribe
- Pawnee Nation of Oklahoma
- Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
- Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
- Southern Ute Indian Tribe
- Spirit Lake Tribe, North Dakota
- Standing Rock Sioux Tribe of North and South Dakota
- Ute Indian Tribe of the Uintah and Ouray Reservation
- Ute Mountain Ute Tribe
- Yankton Sioux Tribe of South Dakota

In its response dated 15 March 2024, the Northern Arapahoe Tribe identified a high probability of properties that hold religious or cultural significance. Although the letter did not signify the name of the site, the Sand Creek NHS described above is a known cultural property in the APE. The Northern Arapahoe Tribe indicated that it wishes to be a consulting party for the Proposed Action.

3.7.3 Environmental Consequences

3.7.3.1 Evaluation Criteria

Adverse impacts to cultural resources would occur if the Proposed Action or Alternatives results in the following:

- physically altering, damaging, or destroying all or part of a resource;
- altering characteristics of the surrounding environment that contribute to the resource's significance;
- introducing visual or audible elements that are out of character with the property or alter its setting;
- neglecting the resource to the extent that it deteriorates or is destroyed; or
- the sale, transfer, or lease of the property out of agency ownership (or control) without adequate enforceable restrictions or conditions to ensure preservation of the property's historic significance.

For the purposes of this EA, an impact is considered significant if it alters the integrity of a NRHP-listed, eligible, or potentially eligible resource or potentially impacts TCPs. Under the alternatives, effects upon cultural resources would include indirect effects due to minor changes in visual and subsonic noise intrusions and direct effects resulting from airplane crashes and vibration effects from subsonic flights. The potential for a direct effect due to an aircraft crash within the APE is extremely low, and the potential for direct impacts of a crash on any specific resource is not considered reasonably foreseeable.

3.7.3.2 Alternative 1

Architectural Resources

There are three NRHP-listed structures within the APE under Alternative 1 (see **Table 3-16** and **Figure 3-3**). All resources are significant for their physical distinctive construction methods and design, and physical setting is not an important aspect of the resources' significance. Alternative 1 would only involve airspace modification actions, that is, lowering the altitude floor to 300 feet AGL, but no construction or

ground disturbance would occur. Due to lower altitudes, the potential exists for overhead flights to be seen during daytime hours; however, the low frequency of proposed operations would not result in visual impacts to these resources. Therefore, no adverse effects to architectural resources would be anticipated with implementation of Alternative 1.

Archaeological Resources

There are four NRHP-listed and five eligible archaeological resources within the APE under Alternative 1 (see **Table 3-17** and **Figure 3-3**). Measures would be taken to mitigate potential effects caused by the IR-177 MTR on the Sand Creek Massacre NHS based on the conclusions of the 2013 consultation. Altus AFB would be required to fly around the established avoidance area at Sand Creek. With these measures in place, adverse impacts to the Sand Creek NHS would not be anticipated with implementation of Alternative 1; however, the training capabilities of Altus AFB would be limited by this approach.

The proposed altitude for Alternative 1 over the Amache NHS is 300 feet AGL to 7,000 feet MSL. Due to the sensitive nature of this site, adverse impacts to the Amache NHS would occur if training activities under Alternative 1 were focused at low altitude along the western boundary of the MTR at Point D. There is no established avoidance area around the Amache NHS. However, only a portion of the Amache NHS is located within the APE, and Altus AFB would be able to avoid flying directly over the site without negatively impacting training operations. Internal special operating procedures would identify the site for avoidance, resulting in no adverse effect to the Amache NHS.

Under Alternative 1, the proposed MTR altitude over the Santa Fe National Historic Trail would range from 7,000 feet MSL to 19,000 feet MSL. The Sante Fe Trail is an area of recreation where visitors' experiences of the historic landscape could be impacted by noise or flight activities. However, adverse impacts to the Santa Fe Trail resources are not anticipated under Alternative 1 due to the high elevation of any proposed flight activities between Points A and B. Noise levels in this segment would be less than 52 dB, or the level of a quiet, suburban, residential area. The potentially eligible archaeological resources within the Alternative 1 APE are eligible only under Criterion D, which is the likelihood to yield information important in prehistory or history. Alternative 1 is not anticipated to have the potential to adversely affect this aspect of resource eligibility.

Historic District Resources

Point of Rocks-Middle Spring Santa Fe Trail Historic District is located within the Alternative 1 APE (**Figure 3-3**). Similar to the Santa Fe Trail segments discussed above, the visitor experience of the historic landscape would not be anticipated to be impacted because the proposed altitude for flight operations at this location would range from 7,000 feet MSL to 19,000 feet MSL, resulting in no visual impacts to the resources and no adverse effect to the historic district under Alternative 1.

Traditional Cultural Properties

The Sand Creek Massacre NHS, described under archaeological resources, has been identified as a TCP by the Northern Arapahoe Tribe. As part of previous consultation between federally recognized tribes, the NPS, and ANG, conditions and measures were put in place to reduce potential impacts on these resources including a 5-nm avoidance area and prevention of flights during tribal ceremonies. These previously established measures would be recognized under Alternative 1 of the Proposed Action. Therefore, there would be no adverse effect to TCPs with implementation of Alternative 1.

3.7.3.3 Alternative 2

Architectural Resources

Alternative 2 would involve the same APE as Alternative 1 (see **Table 3-16** and **Figure 3-3**). As described under Alternative 1, adverse impacts to architectural properties would not be anticipated to occur and there would be no adverse effect to architectural resources with implementation of Alternative 2.

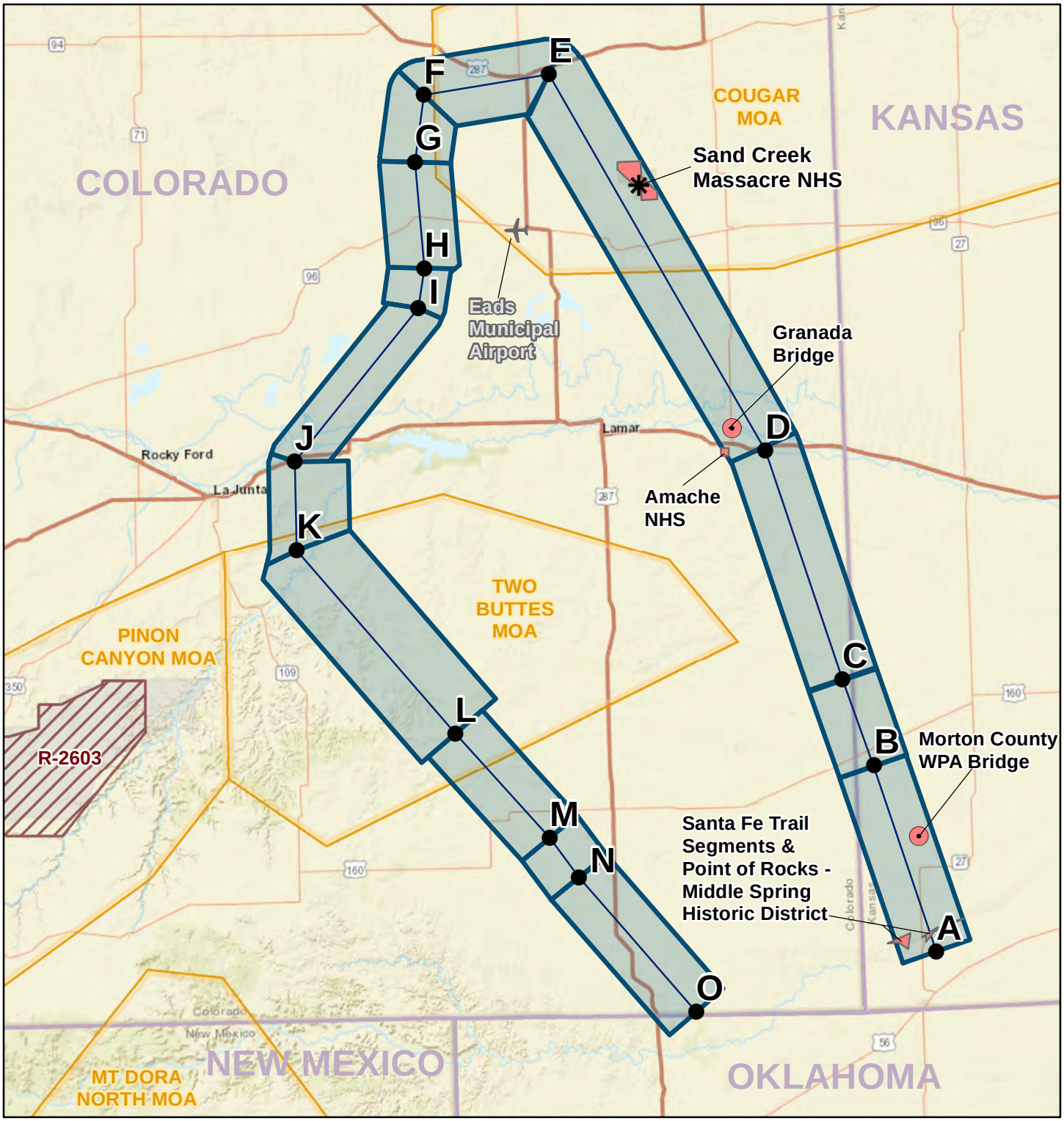


FIGURE 3-3

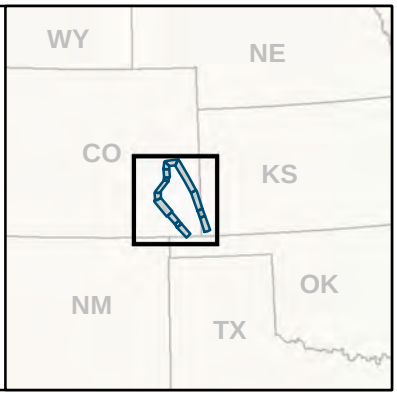
Cultural Resources Within the APE – Alternatives 1 and 2

- IR-177 Waypoints
- NRHP Resource Point
- Military Operations Areas
- Restricted Airspace
- IR-177 Proposed Airspace to Retain
- NRHP Resource Polygon

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N



Archaeological Resources

Alternative 2 would have the same APE as Alternative 1 (see **Table 3-17** and **Figure 3-3**). However, under Alternative 2, Altus AFB would not standardize the floor of the MTR to 300 feet and would not result in an adverse effect on resources. Point D, nearest the Amache NHS, has an altitude floor of 5,700 feet MSL, and flight operations would have no adverse effect on the Amache NHS at that altitude. With the same avoidance measures in place as described under Alternative 1 for the Sand Creek Massacre NHS avoidance area, Alternative 2 also would have no adverse effect on the Sand Creek Massacre NHS. Altus AFB would still be limited in its training operations because of the requirement to fly above the avoidance area, as described under Alternative 1. Alternative 2 would also result in no adverse effect to the Santa Fe Trail segments and potentially eligible sites. The MTR floor is above 5,700 feet MSL in this location and visitors of the trail would be unaffected by flight operations. Therefore, there would be no adverse effect to archaeological resources with implementation of Alternative 2.

Historic District Resources

Alternative 2 contains one historic district located within the APE, the Point of Rocks-Middle Spring Santa Fe Trail Historic District (**Figure 3-3**). As described under Alternative 1, the visitor experience of the historic landscape associated with the Santa Fe Trail segments could be adversely impacted by flight operations; however, the proposed altitude under Alternative 2 for the Santa Fe Trail location would range from 5,700 feet MSL to 19,000 feet MSL, and there would be no visual impacts to the resource. Due to the altitude, there would be no adverse effect to the historic district with implementation of Alternative 2.

Traditional Cultural Properties

Alternative 2 would implement the same avoidance measures described under Alternative 1 to prevent impacts to the Sand Creek Massacre NHS within in the APE. Therefore, there would be no adverse effect to TCPs with implementation of Alternative 2.

3.7.3.4 Alternative 3 (Preferred Alternative)

Architectural Resources

The APE under Alternative 3 would contain the same architectural resources as Alternative 1 (see **Table 3-16** and **Figure 3-3**). Therefore, there would be no adverse effect to architectural resources with implementation of Alternative 3.

Archaeological Resources

Alternative 3 would modify the legacy IR-177 MTR to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre NHS while avoiding Eads Municipal Airport by 3 nm. This alternative would add two points to this MTR segment, Points E and F (see **Table 3-18** and **Figure 3-4**) and allow 4 nm on either side of the centerline, which would maintain the route structure and grant aircraft operating in IR-177 increased capability to navigate around the Sand Creek Massacre NHS while retaining navigable training operations. This MTR modification would have a proposed lowest altitude of 300 feet AGL and a proposed highest altitude of 7,000 feet MSL. Further, the DAF would specify in the AP/1B describing the IR-177 special operating procedures that aircraft would avoid overflying or operating within a 5-nm buffer around the Sand Creek Massacre NHS. By modifying the MTR in this route segment, the DAF would be able to conduct its mission operations with no restrictions while lessening potential visual and noise impacts to visitors of the Sand Creek Massacre NHS. There would be no adverse effect to the Sand Creek NHS with implementation of Alternative 3.

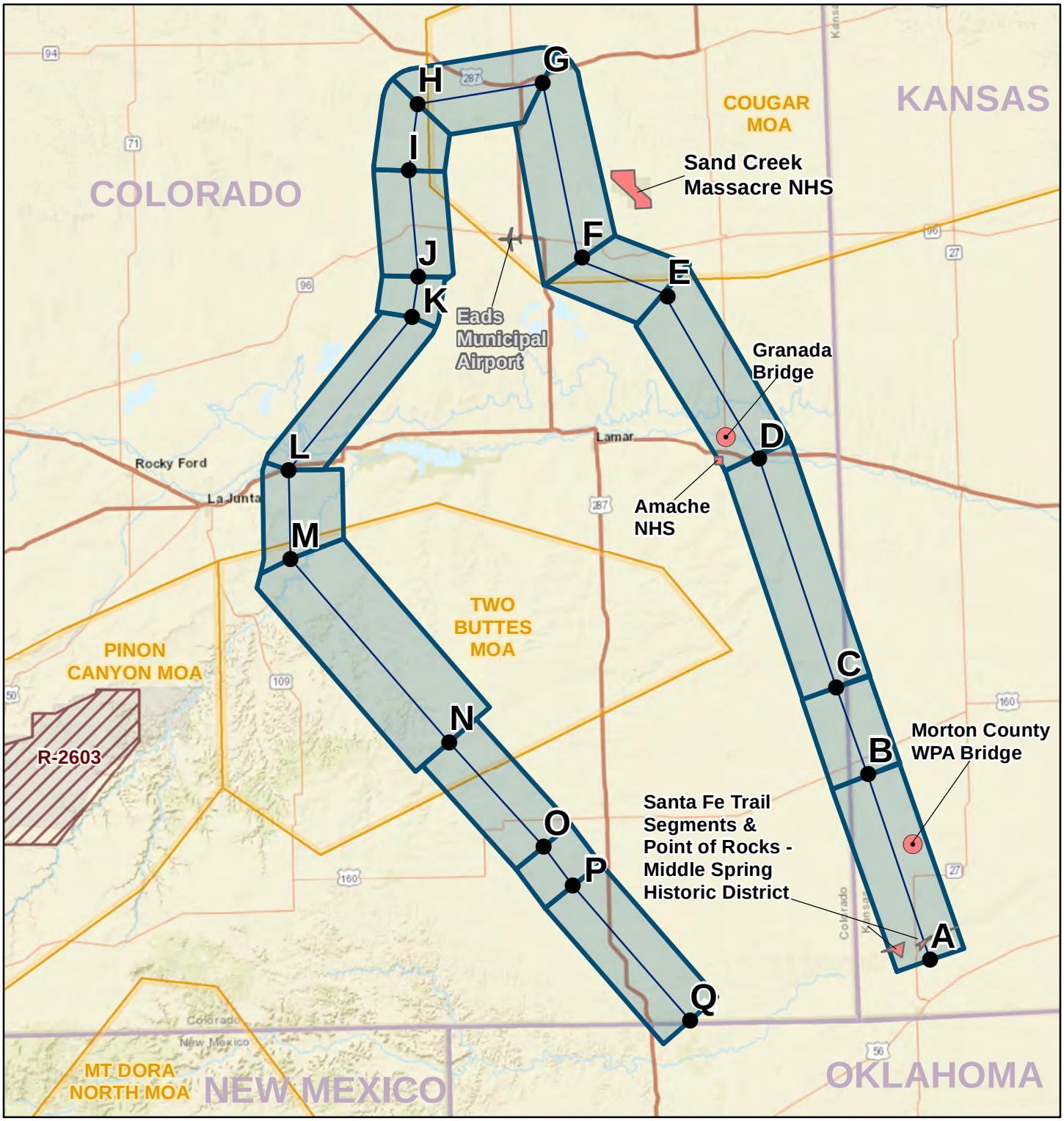


FIGURE 3-4

Cultural Resources Within the APE – Alternative 3

- IR-177 Waypoints
- IR-177 Proposed Airspace to Retain
- NRHP Resource Point
- NRHP Resource Area
- Military Operations Areas
- Restricted Airspace

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

The Amache NHS is not fully encompassed by Alternative 3. The MTR segment is located in the same position as under Alternatives 1 and 2. Due to the sensitive nature of the Amache NHS, Alternative 3 would have the potential to result in an adverse effect if training activities were focused at low altitude along the western boundary of the MTR at Point D. There is no established avoidance area surrounding Amache NHS. However, only a portion of the Amache NHS is located within the APE, and Altus AFB would be able to avoid flying directly over the site without negatively impacting training operations. Internal special operating procedures would identify the site for avoidance, resulting in no adverse effect to the Amache NHS.

As described under Alternative 1, Alternative 3 would result in no adverse effect to the Santa Fe Trail resources due to the high elevation of any proposed flight activities between Points A and B. Alternative 3 also would not have the potential to adversely affect resource eligibility in this location.

Historic District Resources

Alternative 3 contains one historic district located within the APE, the Point of Rocks-Middle Spring Santa Fe Trail Historic District (see **Figure 3-4**). Alternative 3 contains one historic district located within the APE. As described under Alternative 1, the visitor experience of the historic landscape associated with the Santa Fe Trail segments could be adversely impacted by flight operations; however, the proposed altitude under Alternative 3 for the Santa Fe Trail location would range between 7,000 feet MSL to 19,000 feet MSL and there would be no visual impacts to the resource. Due to the altitude, there would be no adverse effect to the historic district under Alternative 3.

Traditional Cultural Properties

Alternative 3 would modify the MTR to include two additional points for complete avoidance of the Sand Creek NHS. Flight training operations would not need to be modified to go around the avoidance area. Therefore, there would be no adverse effect to TCPs with implementation of Alternative 2.

3.7.3.5 No Action Alternative

Under the No Action Alternative, the IR-177 MTR would not be utilized or reconfigured. There would be no change to cultural resources within the IR-177 MTR beyond baseline conditions. The avoidance area around the Sand Creek Massacre NHS would be unaffected, and Altus AFB would have no flight operations that would come into contact with this resource. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.7.3.6 Cumulative Impacts

The Proposed Action would result in no adverse effect to cultural resources. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR 500 and 501 would occupy portions of the same airspace as IR-177 in southeastern Colorado and encounter many of the same resources and sites. The anticipated utilization of those IRs by Cannon AFB is not currently known; however, avoidance of the Sand Creek NHS would be required. The result of the modifications to the Cheyenne MOA resulted in the establishment of the avoidance area around Sand Creek NHS, protecting the resource from further impacts as a result of aircraft operations, including the Proposed Action. The Proposed Action, when considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, would not result in significant, adverse cumulative impacts to cultural resources.

3.7.3.7 Mitigation Measures

The following measures are proposed to mitigate the potential for impacts to cultural resources from the Proposed Action:

- The 140 WG would suspend flights over the Sand Creek Massacre NHS during tribal ceremonies with advance notice of the date, time, and location of such ceremonies.
- The 140 WG would restrict flights below 5,000 feet AGL within a 5 nm radius of the Sand Creek Massacre NHS marker, and no flights over the site would be armed.
- Internal special operating procedures would identify the Amache NHS site for avoidance.

3.8 BIOLOGICAL/NATURAL RESOURCES

3.8.1 Definition of the Resources

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

The ROI for this resource is the area beneath the proposed IR-177 MTR.

3.8.1.1 Invasive Species

Invasive species are non-native species in an ecosystem whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health. EO 13751, *Safeguarding the Nation from the Impacts of Invasive Species*, requires federal agencies to identify actions that may affect invasive species; use relevant programs to prevent introductions of invasive species; detect, respond, and control such species; monitor invasive species populations; and provide for restoration of native species. Invasive species damage native habitat and impede management by outcompeting native species.

3.8.1.2 Endangered Species Act

The ESA established protection for threatened and endangered species and the ecosystems upon which they depend. Sensitive and protected biological resources include plant and animal species listed as threatened, endangered, or special status by USFWS. The ESA also allows the designation of geographic areas as critical habitat for threatened or endangered species. Under the ESA, an “endangered species” is defined as any species in danger of extinction throughout all, or a large portion, of its range. A “threatened species” is defined as any species likely to become an endangered species in the foreseeable future. USFWS maintains a list of candidate species being evaluated for possible listing as threatened or endangered under the ESA. Although candidate species receive no statutory protection under the ESA, USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA in the future. Consultation does not apply to candidate species; however, there is an alternative regulatory tool of holding a conference with USFWS that is available for candidate species.

CPW oversees the Colorado State Wildlife Action Plan (SWAP), which identifies Colorado’s Species of Greatest Conservation Need, or those species or habitat that are the most vulnerable. The SWAP is updated every 10 years. The KDWP oversees the Kansas *Nongame and Endangered Species Conservation Act* which allows KDWP to undertake appropriate conservation measures for threatened and endangered wildlife species.

3.8.1.3 Migratory Bird Treaty Act

The MBTA makes it unlawful for anyone to take migratory birds or their parts, nests, or eggs unless permitted to do so by regulations. Per the MBTA, "take" is defined as "pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR § 10.12). Birds protected under the MBTA include nearly all species in the US except for non-native/human-introduced species and some game birds.

EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires all federal agencies undertaking activities that may negatively impact migratory birds to follow a prescribed set of actions to further implement MBTA. EO 13186 directs federal agencies to develop a Memorandum of Understanding with USFWS that promotes the conservation of migratory birds.

The *National Defense Authorization Act for Fiscal Year 2003* (Public Law 107-314, 116 Stat. 2458) provided the Secretary of the Interior the authority to prescribe regulations to exempt the armed forces from the incidental take of migratory birds during authorized military readiness activities. Congress defined military readiness activities as all training and operations of the US Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Further, in October of 2012, the *Authorization of Take Incidental to Military Readiness Activities* was published in the *Federal Register* (50 CFR § 21.15), authorizing incidental take during military readiness activities unless such activities may result in significant adverse effects on a population of a migratory bird species.

In December 2017, the US Department of the Interior issued M-Opinion 37050, which concluded that the take of migratory birds from an activity is not prohibited by the MBTA when the purpose of that activity is not the take of a migratory birds, eggs, or nests. On 11 August 2020, the US District Court, Southern District of New York, vacated M-Opinion 37050. Thus, incidental take of migratory birds is again prohibited. The interpretation of the MBTA remains in flux, and additional court proceedings are expected.

3.8.1.4 Bald and Golden Eagle Protection Act

The BGEPA prohibits actions to "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof." Further, the BGEPA defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb," and "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, injury to an eagle, a decrease in productivity by substantially interfering with the eagle's normal breeding, feeding or sheltering behavior, or nest abandonment by substantially interfering with the eagle's normal breeding, feeding, or sheltering behavior." The BGEPA also prohibits activities around an active or inactive nest site that could result in disturbance to returning eagles.

3.8.1.5 Aquatic Resources

Aquatic resources are habitats that contain either permanent or sufficient temporary water to support plant or wildlife species that require water or hydric soils for at least part of their life cycle.

3.8.2 Existing Conditions

3.8.2.1 Vegetation

The landscape within the ROI is situated in the Great Plains-Palouse Dry Steppe Province Ecoregion, in the shortgrass prairie ecosystem and is characterized by relatively level plains and undulating hills (Bailey, 1998). The climate is dry and semi-arid. Grasslands are the predominant vegetation type in southeastern Colorado and southwestern Kansas, representing the primary biome within the ROI. Common plant associations are buffalo-galleta grasses (*Bouteloua dactyloides* and *Hilaria jamesii*), blue grama (*Bouteloua gracilis*), and western wheatgrass (*Elymus smithii*) (Bailey, 1998; Hazlett, 2004). The grasses are usually

bunched and sparsely distributed in some steppe areas. In some areas, snakeweed (*Gutierrrezia sarothrae*) shrubs are common. In other areas, cholla cactus (*Opuntia imbricata*) is conspicuous in the landscape. Scattered trees and shrubs are occasionally present. Cottonwood (*Populus deltoides*), willows (*Salix* spp.), and other riparian species can be found along the riverbanks. The Comanche National Grassland occupies the southern portion of the ROI. Dryland farming and irrigated farming occur in the northern part of the ROI.

3.8.2.2 Invasive Species

Invasive plants in Colorado fall under the *Colorado Noxious Weed Act*, which categorizes noxious weeds in three categories. Category "A" weeds are rare noxious weeds that should be eradicated when found. Yellow star thistle (*Centaurea solstitalis*) is an example of a Category A weed found within the ROI. Category "C" weeds are widespread and well-established invasive species that may undergo control efforts, though these efforts are not required by the *Colorado Noxious Weed Act*. Canadian thistle (*Cirsium arvense*), bindweed (*Convolvulus arvense*), cheatgrass (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), Russian thistle or tumbleweed (*Salsola tragus*), alkali weed (*Kochia scoparia*), and horseweed (*Conyza canadensis*) are Category "C" invasive species found within the ROI. Category "B" species are intermediate species just beginning to spread into an area; local commissioners can designate these species for eradication. Dalmatian toadflax (*Linaria dalmatica*), broadleaf pepperplant (*Lepidium latifolium*), Russian olive (*Elaeagnus angustifolia*), musk thistle (*Carduus nutans*), Russian knapweed (*Centaurea repens*), and teasel (*Dipsacus fullonum*) are examples of Category "B" weeds found in the ROI.

3.8.2.3 Wildlife

Adapted for grasslands, pronghorn antelope (*Antilocapra americana*) are one of the most abundant large mammals in the ROI. Mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*) are often found near riparian areas where brush cover is available; they can also be found in sagebrush-dominated sites and near crop land. CPW identified tracts of mule deer severe winter range within the ROI. Small mammalian species are abundant. These species include badger (*Gulo gulo*), bobcat (*Lynx rufus*), red and gray fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), long-tailed weasel (*Mustela frenata*), raccoon (*Procyon lotor*), desert cottontail (*Sylvilagus audubonii*), spotted ground squirrel (*Xerospermophilus spilosoma*), porcupine (*Erethizon dorsatum*), big brown bat (*Eptesicus fuscus*), black-tailed and Gunnison prairie dog (*Cynomys ludovicianus* and *Cynomys gunnisoni*), and beaver (*Castor canadensis*) (Bissell, 1978). Birds characteristic of the area include teal species (*Anas* spp.), sora (*Porzana Carolina*), Virginia rail (*Rallus limicola*); red-tailed hawk (*Buteo jamaicensis*); common crow (*Corvus brachyrhynchos*); ring-necked pheasant (*Phasianus colchicus*); sage grouse (*Centrocercus urophasianus*); greater prairie chickens (*Tympanuchus cupido*); Gambel's, scaled, and bobwhite quail (Callipepla gambelii *Callipepla squamata*, and *Colinus virginianus*); European starling (*Sturnus vulgaris*); and wild turkey (*Meleagris gallopavo*) (Sparks et al., 2005). Among the many smaller birds present are the horned lark (*Eremophila alpestris*), lark bunting (*Calamospiza melanocorys)*, and western meadowlark (*Sturnella neglecta)*. Reptile and amphibian species include the prairie rattlesnake (*Crotalus viridis)*, western plains garter snake (*Thamnophis radix)*, Colorado checkered whiptail (*Aspidoscelis neotesselata)*, leopard frog (*Rana pipiens)*, and western box turtle (*Terrapene ornate*) (Rennicke, 1990).

3.8.2.4 Aquatic Resources

The ROI has numerous lakes, rivers, and streams, some of which contain non-woody riparian areas, wooded riparian areas dominated by cottonwood, wooded riparian areas dominated by aspen, shrub riparian areas primarily of shrub willows, and habitat with cottonwood, willow, and sedges along waterways.

3.8.2.5 Threatened or Endangered Species

In accordance with the ESA, the DAF contacted the USFWS, CPW, and KDWP regarding the presence of threatened and endangered species in the ROI. There is no critical habitat for threatened and endangered species known to occur in the ROI. **Table 3-19** lists all threatened and endangered species that migrate through or whose historic range overlaps the ROI. Listed species in Oklahoma did not have additional state protection designations.

Table 3-19.
Federally and State-Listed Species with Potential to Occur Within the ROI

Species	Type	State Status	Federal Status	Critical Habitat Present
Black-footed ferret (*Mustela nigripes*)	Mammal	CSE, KSE	Endangered	No
Gray wolf (*Canis lupus*)	Mammal	CSE	Endangered	No
New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	Mammal	NA	Endangered	No
Tricolored bat (*Perimyotis subflavus*)	Mammal	NA	Proposed Endangered	No
Eastern black rail (*Laterallus jamaicensis* ssp. *Jamaicensis*)	Bird	NA	Threatened	No
Lesser prairie chicken (*Tympanuchus pallidicinctus*)	Bird	CST	Threatened	No
Piping plover (*Charadrius melodus*)	Bird	CST, KST	Threatened	No
Rufa red knot (*Calidris canutus rufa*)	Bird	NA	Threatened	No
Monarch butterfly (*Danaus plexippus*)	Insect	NA	Candidate	No

Sources: CPW, 2024; IPaC, 2024; KDWP, 2024
CSE = Colorado State Endangered; CST = Colorado State Threatened; CSC = Colorado State Species of Greatest Conservation Need; NA = not applicable; KSE = Kansas state endangered

Black-footed ferrets (*Mustela nigripes*) are a federally and state-listed endangered species for both Colorado and Kansas (CPW, 2015; KDWP, 2019). The black-footed ferret is not state-listed within Oklahoma. CPW began reintroducing black-footed ferrets in the Eastern Plains of Colorado in 2013. Currently these reintroduction efforts are occurring in Bacca, Bent, and Prowers counties in southeastern Colorado, all of which fall within the ROI (CPW, 2019). There have been no confirmed reports of black-footed ferrets in Kansas since 1957 and there is no designated black-footed ferret critical habitat in Kansas.

The gray wolf (*Canis lupus*) is a federally and state-listed endangered species for Colorado. In 2020, CPW started reintroduction efforts to support the conservation and population growth of gray wolves in Colorado west of the Continental Divide. In 2023, 10 wolves were captured in Oregon and relocated to Summit and Grand counties in western Colorado (CPW, 2023). Currently, there are no reported sightings of gray wolves within the limits of the ROI in Colorado or Kansas.

The New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) is federally listed as endangered and designated as a Tier 1 Species of Greatest Conservation Need in Colorado (CPW, 2015). CPW has identified its overall range in Colorado to be south of Trinidad, Colorado, which is well outside the ROI. There are no reports or designation of the New Mexico meadow jumping mouse in Kansas (KDWP, 2019).

In 2022, the USFWS proposed to list the tricolored bat (*Perimyotis subflavus*) as an endangered species (87 FR 56381). Under the proposed listing, the USFWS stated that designating critical habitat for this species is not warranted. Tricolored bat habitat is known to occur in the ROI. Although CPW is active with the North American Bat Monitoring Program, there are no bat species listed as Species of Greatest Conservation Need in Colorado (CPW, 2015). The tricolored bat also has no designation in Kansas (KDWP 2019).

The eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*) is a federally listed threatened species. Eastern black rails have declined over the last century due almost entirely to habitat loss and destruction. They are not listed as a Species of Greatest Conservation Need in Colorado or Kansas (CPW, 2015; KDWP, 2019). Eastern black rails have been observed within the ROI, primarily in the Lower Arkansas River Basin and are known to breed within the ROI in Bent and Prowers counties in Colorado.

The lesser prairie chicken (*Tympanuchus pallidicintus*) is known to occur in the ROI in Colorado and Kansas and is federally listed as threatened. It is listed by CPW as a Tier 1 Species of Greatest Conservation Need (CPW, 2015). Habitat consists of relatively sandy grassland areas that have an abundance of tall grasses. Populations have declined significantly in Colorado, largely due to long-term habitat loss and periods of extensive drought in the southeastern part of the state. CPW has identified several lesser prairie chicken leks, or breeding areas, within the ROI. Additionally, CWP has designated priority habitat within the ROI. Priority habitat is defined by CPW as areas of high probability of use (summer or winter) within a four-mile buffer around leks that have been active within the last 10 years. The lesser prairie chicken is a species of conservation concern in Kansas. The breeding season for the lesser prairie chicken is from March 1 through July 15. The male species depends on acoustical signals to attract females; noise, including human-generated noise disruptions, interferes with mating displays.

The piping plover (*Charadrius melodus*) is a small shorebird that occurs as rare migrants in eastern Colorado and western Kansas. Piping plovers are federally listed as threatened, are listed as threatened by KDWP (KDWP, 2019) and are listed by CPW as a Tier 2 Species of Greatest Conservation Need (CPW, 2015). Piping plovers nest on sparsely vegetated shores of reservoirs and gravel pits, nesting directly on the ground. CPW has identified several piping plover high priority habitat production areas in the areas surrounding the city of Lamar. These areas identified do not intersect with the proposed ROI; however, the piping plover has the potential to occur within the project area through migratory travel. KDWP has identified critical habitat in northeastern Kansas, but no critical habitat occurs within the proposed ROI in Kansas.

Rufa red knots (*Calidris canutus rufa*) breed in the central Canadian arctic and migrates south to wintering areas as far south as the Atlantic coasts of Argentina and Chile but also winter in the western Gulf of Mexico from Texas to Mississippi and the Southeast United States from Alabama to North Carolina. The full extent of the rufa red knot range is not well known; however, the species has the potential to occur within the ROI. The rufa red knot is federally listed as threatened but is not listed as a Species of Greatest Conservation Need in Colorado (CPW, 2015) nor is it listed in Kansas (KDWP, 2019).

The monarch butterfly (*Danaus Plexippus*) is a candidate species and not yet listed or proposed for listing by the U. S. Fish and Wildlife Service. It is not listed in Colorado or Kansas (CPW, 2015; KDWP, 2019). The monarch butterfly commonly occurs within the ROI as it migrates south to Mexico.

3.8.2.6 Migratory Birds

Migratory bird species protected under the federal MBTA have the potential to occur within proposed IR-177 MTR ROI (**Table 3-20**). Bald eagle nests have been documented as occurring in the area surrounding the ROI (CPW, 2023). Winter concentrations of bald eagles occur within the ROI along the Arkansas River. Piping plover foraging and production areas have been documented along the Arkansas River adjacent to the ROI.

Table 3-20.
Migratory Bird Species with Potential to Occur Within Proposed IR-177 MTR

Species	Breeding Season in ROI	Breeding Habitat	Potential to Occur Within ROI
Bald eagle (*Haliaeetus leucocephalus*)	Dec 1–Aug 31	Breeding habitat includes areas close to coastal areas, bays, river, lakes, reservoirs, or other bodies of water. Nests in tall trees, on pinnacles, or on cliffs near water.	Commonly occurring. Breeding /Nesting sites identified outside of ROI.
Chestnut-collared longspur (*Calcarius ornatus*)	May 1–Aug 10	Breeding habitat includes the shortgrass and mixed-grass prairies of the northern Great Plains. They typically are found in areas where the grass is shorter than 1 foot but will occasionally be found in tallgrass prairie that has been grazed or mowed.	Potentially occurring. Suitable nesting habitat may occur within or adjacent to the area.
Chimney swift (*Chaetura pelagica*)	Mar 15–Aug 25	Originally nested in natural sites such as caves and hollow trees of old-growth forests. Chimney Swifts now nest primarily in chimneys and other artificial sites with vertical surfaces and low light (including air vents, old wells, abandoned cisterns, outhouses, boathouses, garages, silos, barns, etc.)	Commonly occurring. Breeding /Nesting likely.
Clark's grebe (*Aechmophorus clarkii*)	Jun 1–Aug 31	Breed in colonies on freshwater lakes and reservoirs surrounded by emergent vegetation (cattails, rushes, sedges).	Potentially occurring. Suitable nesting habitat may occur within or adjacent to the area.
Ferruginous hawk (*Buteo regalis*)	Mar 15–Aug 15	Nesting sites depend on available substrates and surrounding land use. If nesting on the ground, locations are generally located far from human activities and on elevated landforms in large grasslands. If nesting in trees, lone or peripheral trees are preferred over densely wooded areas.	Commonly Occurring. Breeding/nesting unlikely.
Golden eagle (*Aquila chrysaetos*)	Dec 1–Aug 31	Habitat includes open and semi-open country, especially in hilly or mountainous terrain. Nests are often located on rock ledges of cliffs, but sometimes in large trees, on steep hillsides, or on the ground.	No potential, suitable nesting habitat is not expected to be found within the project area due to lack of trees or rocky cliffs or ledges.
Hudsonian godwit (*Limosa haemastica*)	N/A	Breeds on grassy tundra in Canada and Alaska, winters in southern South America.	No potential, breeds in Canada and Alaska.
Lesser yellowlegs (*Tringa flavipes*)	N/A	Breeding habitat includes open or semi-open woodlands and wet meadows interspersed with marshes, bogs, and ponds.	No potential, breeds in Canada and Alaska.
Lewis's woodpecker (*Melanerpes lewis*)	Apr 20–Sep 30	Nest cavities excavated in trunk or large branches of large, dead or decaying trees, including burned trees.	Potentially occurring. Suitable nesting habitat may occur within or adjacent to the area.

Species	Breeding Season in ROI	Breeding Habitat	Potential to Occur Within ROI
Long-billed curlew (*Numenius americanus*)	Apr 1–Jul 31	Breeding habitat includes prairies and grassy meadows, generally wear water. Nests are located on the ground, usually in a flat area with short grass and often near rock.	No potential, no substantial surface water features occur within the Installation, some ephemeral features exist.
Long-eared owl (*Asio otus*)	Mar 1–Jul 15	Long-eared Owls typically use stick nests abandoned by other bird species. Less often, they raise their young in cavities in trees or cliffs, in abandoned squirrel nests, or on the ground.	Potentially occurring. Suitable nesting habitat may occur within or adjacent to the area.
Mountain plover (*Charadrius montanus*)	Apr 15–Aug 15	Nesting habitat includes high plains, shortgrass prairies, and desert tablelands. Nesting areas are characterized by very short vegetation, significant areas of bare ground, and flat or gentle slopes.	Potentially occurring. Suitable nesting habitat may occur within or adjacent to the area.
Pectoral sandpiper (*Calidris melanotos*)	N/A	Nest site is a small depression on the ground, usually in a dry, raised area such as a hummock or ridge. The site is sometimes shielded by dwarf willows.	No potential, breeds in Canada and Alaska.
Pinyon jay (*Gymnorhinus cyanocephalus*)	Feb 15–Jul 15	Commonly nest at the lower elevations of pinyon-juniper woodlands, often where junipers dominate. A few nest in ponderosa pine. They prefer extensive stands far from high human activity.	Potentially occurring. Suitable nesting habitat may occur within or adjacent to the area.
Red-headed woodpecker (*Melanerpes erythrocephalus*)	May 10–Sep 10	Habitat includes open woodlands (especially with beech or oak), open situations with scattered trees, parks, cultivated areas, and gardens. Nests in a hole excavated in a live tree, dead stub, utility pole, or fencepost.	No potential. Due to lack of trees and vegetation, no suitable habitat for this species is expected within and adjacent to the area.
Sprague's pipit (*Anthus spragueii*)	N/A	Obligate grassland birds, nest in relatively dry grassland, especially native prairie, avoiding brushy areas and cultivated fields.	No potential, breeds in northern Great Plains.

Bird/Wildlife-Aircraft Strike Hazard

Bird-aircraft strikes constitute a safety concern because they can result in damage to aircraft or injury to Aircrews or local populations if they result in an aircraft crash. Aircraft may encounter birds at altitudes of flight level 300 or higher. However, most birds fly close to the ground. More than 98 percent of reported bird-aircraft strikes occur below 5,000 feet AGL (DAF, 2020). The number and severity of bird-aircraft strike mishaps for FY 2015–2019 is provided in **Table 3-21**.

Altus AFB maintains a Bird/Aircraft Strike Hazard (BASH) plan, which provides guidance for reducing the bird/animal strike hazard where Altus AFB conducts normal flying operations. The BASH plan is reviewed annually and updated as appropriate. The Avian Hazard Advisory System (AHAS) provides access to bird-strike risk for published MTRs.[5] AHAS uses a historical Bird Avoidance Model (BAM), which is derived from 30 years of historical data, so it does not adjust for real-time bird movements or population fluctuations. The BAM divides the year into 26 two-week periods, each with a day and night period. AHAS generates a risk assessment based on historical information for any requested period. AHAS data were pulled from

[5] The AHAS tool is available at https://usahas.com

January, April, July, and October to reflect a sample point that would fall within each migratory bird breeding season (see **Table 3-20**). The results indicate that risk levels within the IR-177 MTR remain "low" throughout the year during both day and night operations.

Table 3-21.
BASH Mishaps by Fiscal Year

Fiscal Year	Class A	Class B	Class C	Class D	Destroyed Aircraft
2015	3	4	59	39	0
2016	3	9	55	35	1
2017	1	6	60	44	0
2018	2	2	60	50	1
2019	0	5	74	40	0
Totals	**9**	**26**	**308**	**203**	**2**

Source: DAF, 2020
BASH = bird/aircraft strike hazard

For short-term updates, AHAS monitors the current bird-strike risk using the network of next-generation weather radar to look for bird activity on low-level routes, ranges, MOA's, or in the vicinity of military airfields. When bird activity is detected, a warning is generated. Predictive models are used for monitoring soaring bird activity that is not visible to the radar.

3.8.3 Environmental Consequences

3.8.3.1 Evaluation Criteria

The level of impact to biological resources is based on the following:

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

Adverse impacts to biological resources would occur if the Proposed Action negatively affects species or habitats of high concern over relatively large areas, or if estimated disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation that ensures that the agency's proposed actions would not adversely affect the continued existence of any threatened or endangered species. The ESA requires that all federal agencies avoid "taking" federally threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with either a "no effect" determination by the federal agency or informal consultation with a "may affect, but not likely to adversely affect" determination and request for concurrence from USFWS or formal consultation via a biological assessment by the federal agency and a biological opinion from USFWS that the Proposed Action would or would not jeopardize the continued existence of a species. For a proposed candidate species or its proposed critical habitat in the project area, if there is a plausible chance of an adverse effect, the federal agency requests a conference with USFWS.

3.8.3.2 Alternative 1

The biological resources that occur in the ROI under Alternative 1 are presented in **Figure 3-5.**

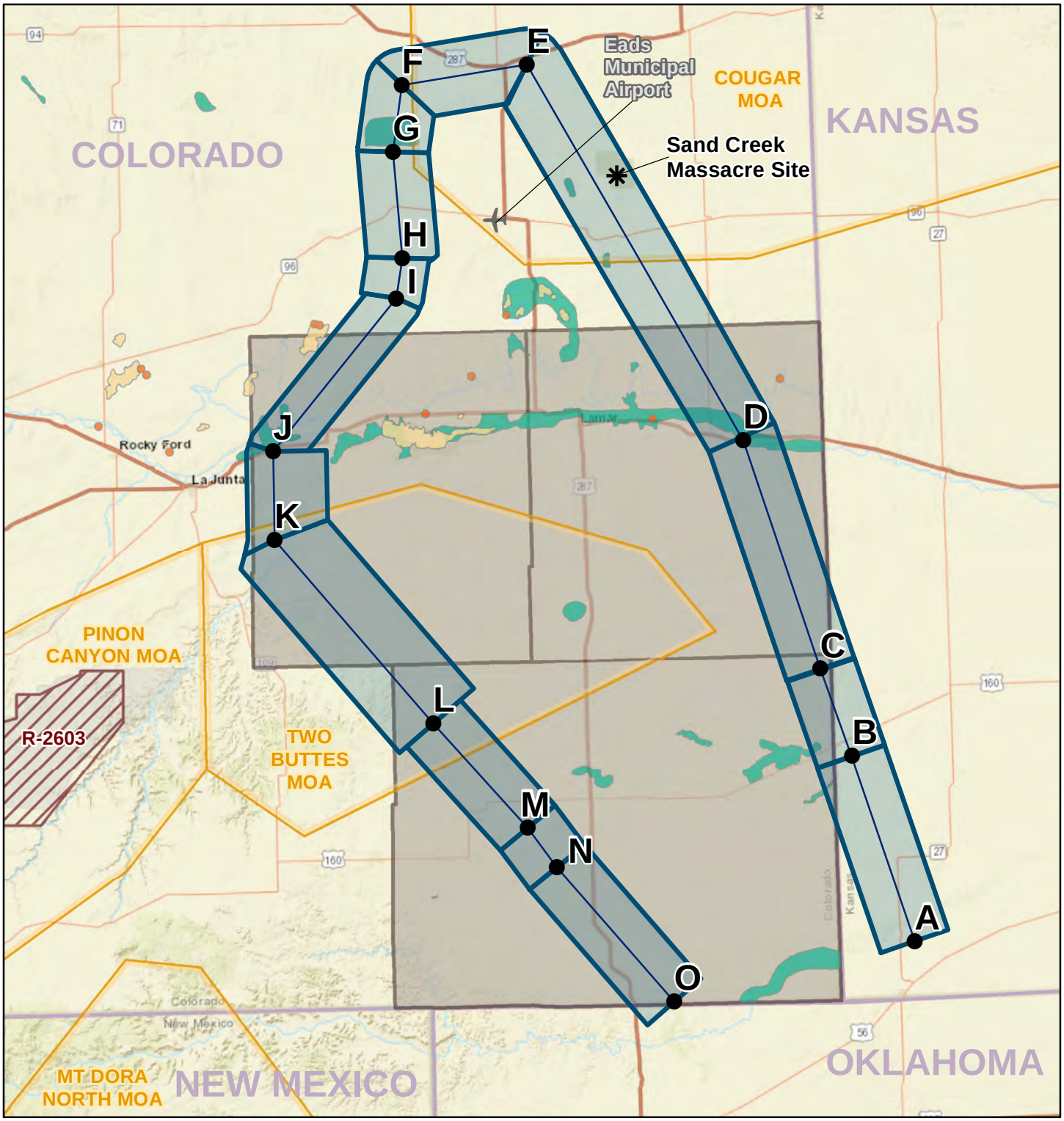


FIGURE 3-5

Wildlife Habitat Within the ROI – Alternatives 1 and 2

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- Bald Eagle Active Nest
- Bald Eagle Winter Concentration
- Black-footed Ferret Release Sites
- IR-177 Proposed Airspace to Retain
- Mule Deer Severe Winter Range

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

Vegetation

Under Alternative 1, the proposed IR-177 MTR flight path would include flight paths that have been used historically without adverse effects on vegetation. The Proposed Action would lower the altitude floor to 300 feet AGL but would not involve any ground-disturbing activities. There would be no potential for spills or flares; therefore, adverse impacts to vegetation resources would not be anticipated with implementation of Alternative 1.

Invasive Species

Under Alternative 1, the proposed IR-177 MTR would not involve any ground-disturbing activities; as such, there would be no opportunity for the introduction of invasive species on equipment. Therefore, adverse impacts would not be anticipated with implementation of Alternative 1.

Wildlife

Under Alternative 1, the proposed IR-177 MTR would not involve any ground-disturbing activities. Waypoints D and J would cross the Arkansas River at locations where CPW has identified mule deer severe winter range (see **Figure 3-5**). Mule deer tend to be in poor body condition from January through March in severe winters; however, noise analysis shows that levels will not exceed 52 dB at any segment, which does not indicate that aircraft operations would disturb, or adversely impact, the wellbeing of mule deer within the ROI. Therefore, adverse impacts to wildlife and habitat would not be anticipated with implementation of Alternative 1.

Aquatic Resources

Under Alternative 1, the proposed IR-177 MTR would not involve any ground-disturbing activities, and adverse impacts to aquatic resources would not be anticipated.

Threatened or Endangered Species

Under Alternative 1, no ground-disturbing activity would occur and none of the observed species would have the potential to be impacted by the proposed IR-177 MTR. There is no critical habitat identified for any of the listed species, and no potential future habitat would be impacted by the Proposed Action. Although no habitat is present, avian species would have the potential to be impacted by low-level flying activities during the transient movement across the ROI. Additionally, there is no critical habitat for any threatened or endangered aquatic species within the ROI. Therefore, there would be no effects to the black-footed ferret, gray wolf, New Mexico meadow jumping mouse, or the monarch butterfly with implementation of Alternative 1. However, the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, and tricolored bat all have the potential to travel through the ROI. If these species travel within the MTR, flight operations, and the associated noise of the low-level flight activities, may have the potential to momentarily disturb these species. Due to the low number of proposed operations, the lack of critical habitat within the ROI, and the intermittent nature of impacts, Alternative 1 may affect, but is not likely to adversely affect the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, or tricolored bat.

Migratory Birds

Under Alternative 1, the Proposed Action could result in bird/aircraft strikes when planes drop below 500 feet AGL. Bird/aircraft strikes occur at low altitudes, generally during the takeoff-climb and approach-landing phases (or as aircraft are decelerating/accelerating at low altitude). The majority of bird strikes reported occur at lower than 500 feet AGL but are not exclusive to this altitude. During migration, strikes can commonly occur up to 6,000 feet AGL. Because military aircraft using the low-level routes commonly fly at low levels and high speeds, there is a greater risk of bird strikes. Altus AFB BASH plan would be followed to avoid such incidents. With these standard measures in place, adverse impacts to migratory birds would not be anticipated with implementation of Alternative 1.

3.8.3.3 Alternative 2

The biological resources that occur in the ROI under Alternative 2 are presented above in **Figure 3-5.**

Vegetation

No adverse impacts to vegetation would occur from implementation of Alternative 2. The proposed IR-177 MTR flight path includes flight paths that have been used historically without adverse effects on vegetation. The Proposed Action would not involve any ground-disturbing activities, would have no potential for spills or flares, and there would be no potential for direct impacts to vegetation under Alternative 2.

Invasive Species

No impacts to invasive species or invasive species management efforts would occur from implementation of the Alternative 2. The proposed IR-177 MTR would not involve any ground-disturbing activities, and there would be no potential for adverse impacts to invasive species. There would be no opportunity for the introduction of invasive species on equipment since there would be no construction or demolition activities associated with Alternative 2.

Wildlife

No adverse impacts to wildlife would occur from implementation of Alternative 2. The establishment of the proposed IR-177 MTR would not involve any ground-disturbing activities, and there would be no potential for adverse impacts to wildlife or habitats.

Aquatic Resources

Under Alternative 2, the proposed IR-177 MTR would not involve any ground-disturbing activities, and adverse impacts to aquatic resources would not be anticipated.

Threatened or Endangered Species

No adverse effects to threatened or endangered species or other state-listed species would occur from implementation of Alternative 2. No ground-disturbing activity would occur with the Proposed Action and none of the observed species would have the potential to be impacted by the establishment of the proposed IR-177 MTR. There is no critical habitat identified for any of the listed species, and no potential future habitat would be impacted by Alternative 2. Although no habitat is present, avian species would have the potential to be impacted by low-level flying activities during the transient movement across the ROI. Additionally, there is no critical habitat for any threatened or endangered aquatic species within the ROI. Therefore, there would be no effects to the black-footed ferret, gray wolf, New Mexico meadow jumping mouse, or the monarch butterfly with implementation of Alternative 2. However, the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, and tricolored bat all have the potential to travel through the ROI. If these species travel within the MTR, flight operations, and the associated noise of the low-level flight activities, may have the potential to momentarily disturb these species. Due to the low number of proposed operations, the lack of critical habitat within the ROI, and the intermittent nature of impacts, Alternative 2 may affect, but is not likely to adversely affect the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, or tricolored bat.

Migratory Birds

Migratory bird species are known to occur in the ROI; however, under Alternative 2, the IR-177 MTR altitude floor would not be standardized to 300 AGL. The potential would still exist for strikes to occur during takeoff and landing from Altus AFB, but no significant adverse impacts to migratory birds would be expected to occur under Alternative 2. No impacts to bald or golden eagles would occur.

3.8.3.4 Alternative 3 (Preferred Alternative)

The biological resources that occur in the ROI under Alternative 3 are presented in **Figure 3-6.**

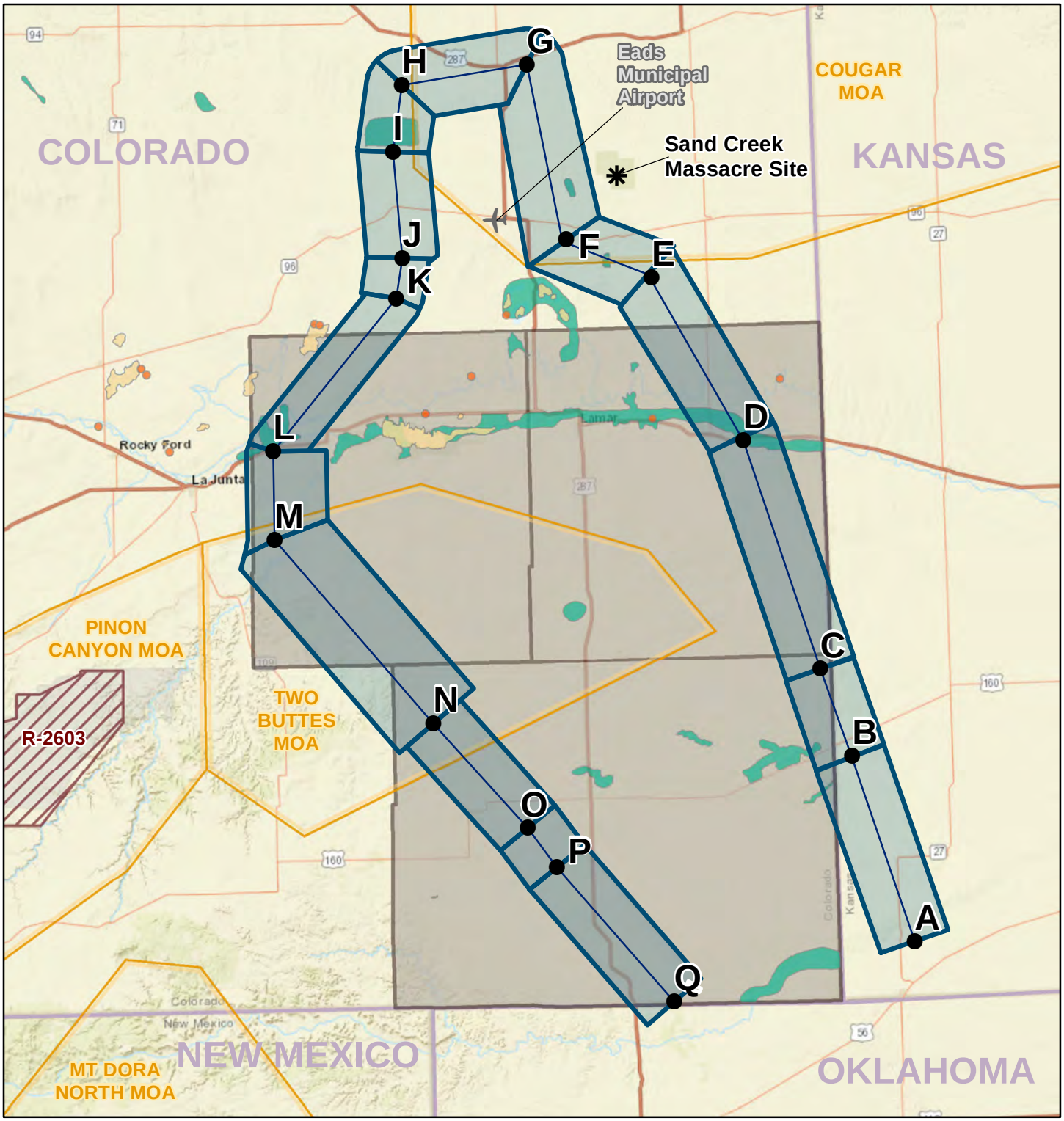


FIGURE 3-6

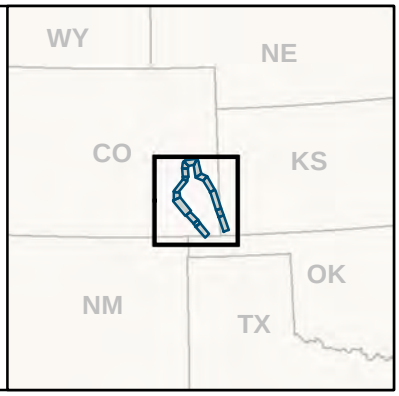
Wildlife Habitat Within the ROI – Alternative 3

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- Bald Eagle Active Nest
- Bald Eagle Winter Concentration
- Black-footed Ferret Release Sites
- IR-177 Proposed Airspace to Retain
- Mule Deer Severe Winter Range

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N



Vegetation

No adverse impacts to vegetation would occur from implementation of Alternative 3. The proposed IR-177 MTR flight path includes flight paths that have been used historically without adverse effects on vegetation. The Proposed Action would not involve any ground-disturbing activities, would have no potential for spills or flares, and there would be no potential for direct impacts to vegetation.

Invasive Species

No impacts to invasive species or invasive species management efforts would occur from implementation of Alternative 3. The proposed IR-177 MTR would not involve any ground-disturbing activities, and there would be no potential for adverse impacts to invasive species. There would be no opportunity for the introduction of invasive species on equipment since there would be no construction or demolition activities associated with Alternative 3.

Wildlife

No adverse impacts to wildlife would occur from implementation of Alternative 3. The establishment of the proposed IR-177 MTR would not involve any ground-disturbing activities, and there would be no potential for adverse impacts to wildlife or habitats. As described under Alternative 1, noise analysis does not indicate that aircraft operations under Alternative 3 would disturb, or adversely impact, the wellbeing of mule deer within the ROI.

Aquatic Resources

Under Alternative 3, the proposed IR-177 MTR would not involve any ground-disturbing activities, and adverse impacts to aquatic resources would not be anticipated.

Threatened or Endangered Species

No adverse effects to threatened or endangered species or other state-listed species would occur from implementation of Alternative 3. No ground-disturbing activity would occur with the Proposed Action and none of the observed species would have the potential to be impacted by the establishment of the proposed IR-177 MTR. There is no critical habitat identified for any of the listed species, and no potential future habitat would be impacted by the Proposed Action. Although no habitat is present, avian species would have the potential to be impacted by low-level flying activities during the transient movement across the ROI. Additionally, there is no critical habitat for any threatened or endangered aquatic species within the ROI. Therefore, Alternative 3 would have no effect to the black-footed ferret, gray wolf, New Mexico meadow jumping mouse, or the monarch butterfly. However, the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, and tricolored bat all have the potential to travel through the ROI. If these species travel within the MTR, flight operations, and the associated noise of the low-level flight activities, may have the potential to momentarily disturb these species. Due to the low number of proposed operations, the lack of critical habitat within the ROI, and the intermittent nature of impacts, Alternative 3 may affect, but is not likely to adversely affect the eastern black rail, lesser prairie chicken, piping plover, rufa red knot, or tricolored bat.

Migratory Birds

Migratory bird species are known to occur in the ROI; however, no adverse impacts to migratory birds would be expected to occur under Alternative 3, and no impacts to bald or golden eagles would occur. Alternative 3, however, could result in bird/aircraft strikes when planes drop below 500 AGL, similar to that described under Alternative 1.

3.8.3.5 No Action Alternative

Under the No Action Alternative, the IR-177 MTR would not be utilized or reconfigured. There would be no change to biological and natural resources underneath the IR-177 MTR beyond baseline conditions. There would be no potential for migratory bird strikes or noise impacts since no flight training activity would occur within the existing IR-177 MTR. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events. Therefore, the DAF has determined that there would be no effects to federally or state-listed threatened or endangered species under the No Action Alternative.

3.8.3.6 Cumulative Impacts

The Proposed Action would result in no effect to threatened and endangered species and would have no potential to impact natural and biological resources on the ground. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR-500 and 501 would occupy much of the same airspace as IR-177 in southeastern Colorado. The anticipated utilization of those IRs is not currently known, but due to the nature of the project, the anticipated impacts would be similar to those expected under the Proposed Action. The Cheyenne MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace that could impact biological and natural resources. The Proposed Action, when considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, would not result in significant, adverse cumulative impacts to biological and natural resources.

3.9 LAND USE

3.9.1 Definition of the Resource

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

Land use describes ownership and management of land that lies beneath the airspace affected by the Proposed Action and examines any conflicts that may exist between the Proposed Action and land use plans and policies for the area potentially affected. The compatibility of existing and planned land use with aviation is usually associated with the acoustic environment (noise), which is described in **Section 3.6** of this EA.

The ROI for land use includes the area beneath the proposed IR-177 MTR.

3.9.2 Existing Conditions

The portion of the IR-177 MTR that would be retained and utilized under the Proposed Action begins at the border of Kansas of Colorado above the Cimarron National Grassland, which is administered by the USFS. The grassland is a 108,175-acre parcel located within Morton and Stevens counties in southwestern Kansas. Several outdoor exhibits/kiosks can be found along specific trail-related points of interest on the grassland. A 19-mile interpretive trail that parallels the Santa Fe National Historic Trail, also discussed in **Section 3.8**, is available to park visitors.

As the IR-177 MTR progresses into Colorado, it passes over privately owned lands that comprise the majority of the rural area beneath the Proposed Action. The area beneath the Proposed Action in southeastern Colorado is scattered with state-owned agricultural leases, primarily utilized for grazing purposes. The Granada State Wildlife Area and Deadman State Wildlife Area are located near Point D of

the Proposed Action in Grenada, Colorado, as well as the Amache NHS directly to the west, also discussed in **Section 3.7.**

The Sand Creek Massacre NHS is located within the project ROI on Bureau of Land Management land. This historic site and the associated protections are discussed in greater detail in **Section 3.7.**

State-owned lands in southeastern Colorado also include pockets of land designated for hunting and fishing under the Public Access Program through CPW. The project ROI generally avoids these area but crosses over recreational lands at various points throughout the MTR.

Figure 3-7 and **3-8** display these attributes in relation to the alternatives.

The USFS also operates the Comanche National Grassland. Areas of this grassland fall beneath portions of the Proposed Action. The USFS manages the Comanche National Grassland to conserve natural resources and wildlife habitat, as well as to protect historic and prehistoric areas. State-owned agricultural leases comprise the small portion of land that overlaps with the Proposed Action in northwestern Oklahoma.

Wind turbine operations are also present within the ROI for the Proposed Action. AETC and the 97th AMW, have conducted or are currently involved in no fewer than eight formal and informal wind mitigation actions to preserve the integrity of IR-177 for low-level training since 2021. **Figures 3-9** and **3-10** illustrate and **Table 3-22** details these actions in relation to the alternatives. Mitigation actions that are currently on hold are not shown in the figure.

These mitigation actions were brokered through the Assistant Secretary of the Air Force Mission Sustainment (SAF/IEIM) Team, who monitors and supports coordination of energy siting projects, including wind turbines and solar panels, either filed with the FAA or informally proposed through DoD Military Aviation and Installation Assurance Siting Clearinghouse. SAF/IEIM works with the DoD Clearinghouse to review proposed energy projects by assessing the potential adverse impacts that the proposed project may have on operations and readiness. SAF/IEIM, in turn, coordinates potential energy projects with the FAA, as well as impacted major commands (MAJCOMs) and their associated installations for feedback and/or mitigation actions.

When formal mitigations are required, a mitigation response team made up of the energy developer and other stakeholders (e.g., SAF/IEIM, MAJCOM, Judge Advocate General–Environmental Law and Litigation Division, and installations) is assembled to determine mitigation options for all identified projects that present adverse mission impacts. Informal cases are also coordinated by SAF/IEIM; in the case of AETC, the DoD Clearinghouse initially seeks to mitigate among the developer, AETC, and the Installation and advise SAF/IEIM of the outcome. The authority of the DoD Clearinghouse is defined in 10 USC § 183(a).

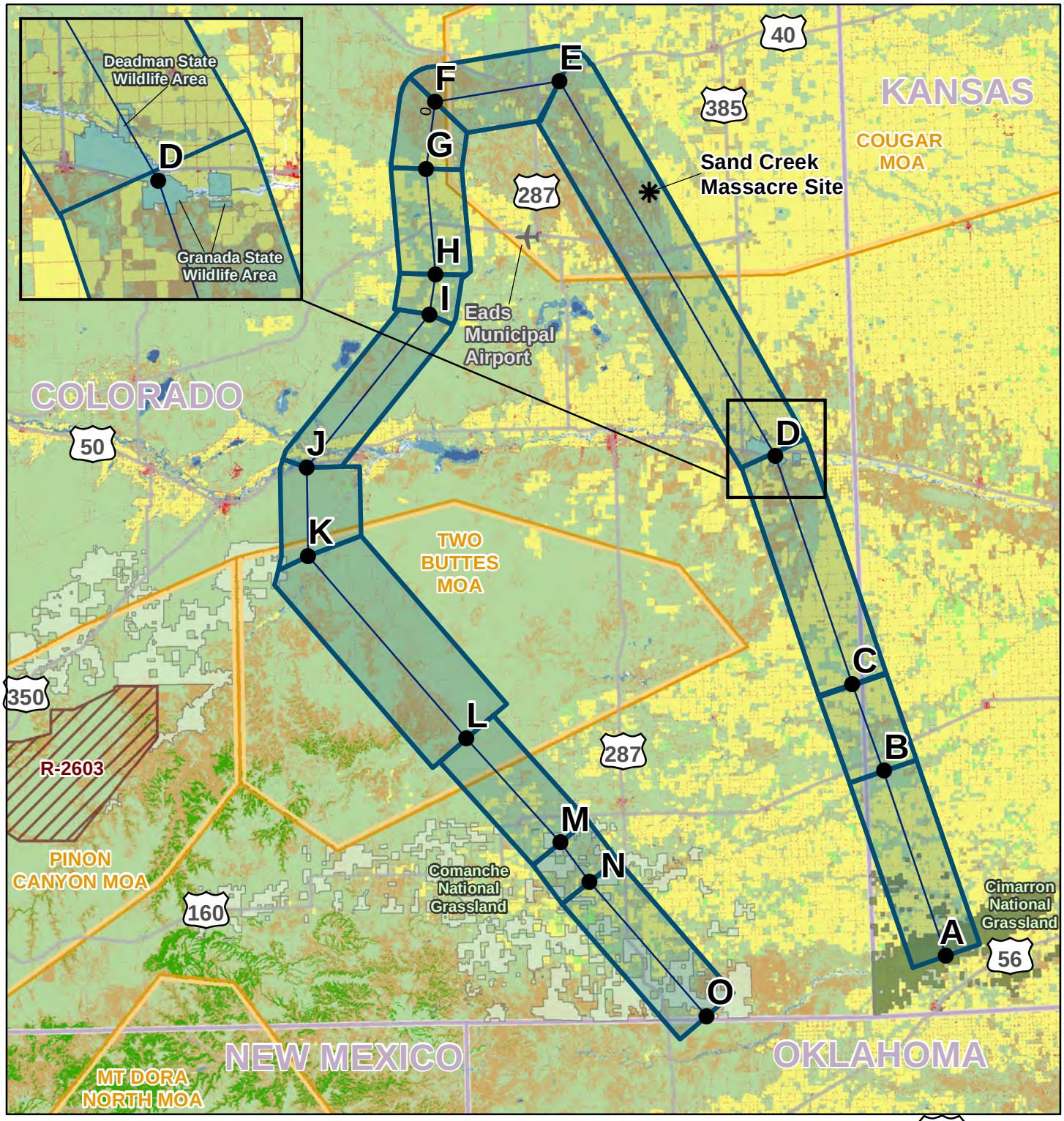


FIGURE 3-7

Land Use/Cover – Alternatives 1 and 2

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- Cimarron National Grassland
- Colorado State Wildlife Area
- Comanche National Grassland
- Cultivated Crops
- Developed, Open Space
- Evergreen Forest
- Herbaceous
- Hay/Pasture
- IR-177 Proposed Airspace to Retain
- Shrub/Scrub

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

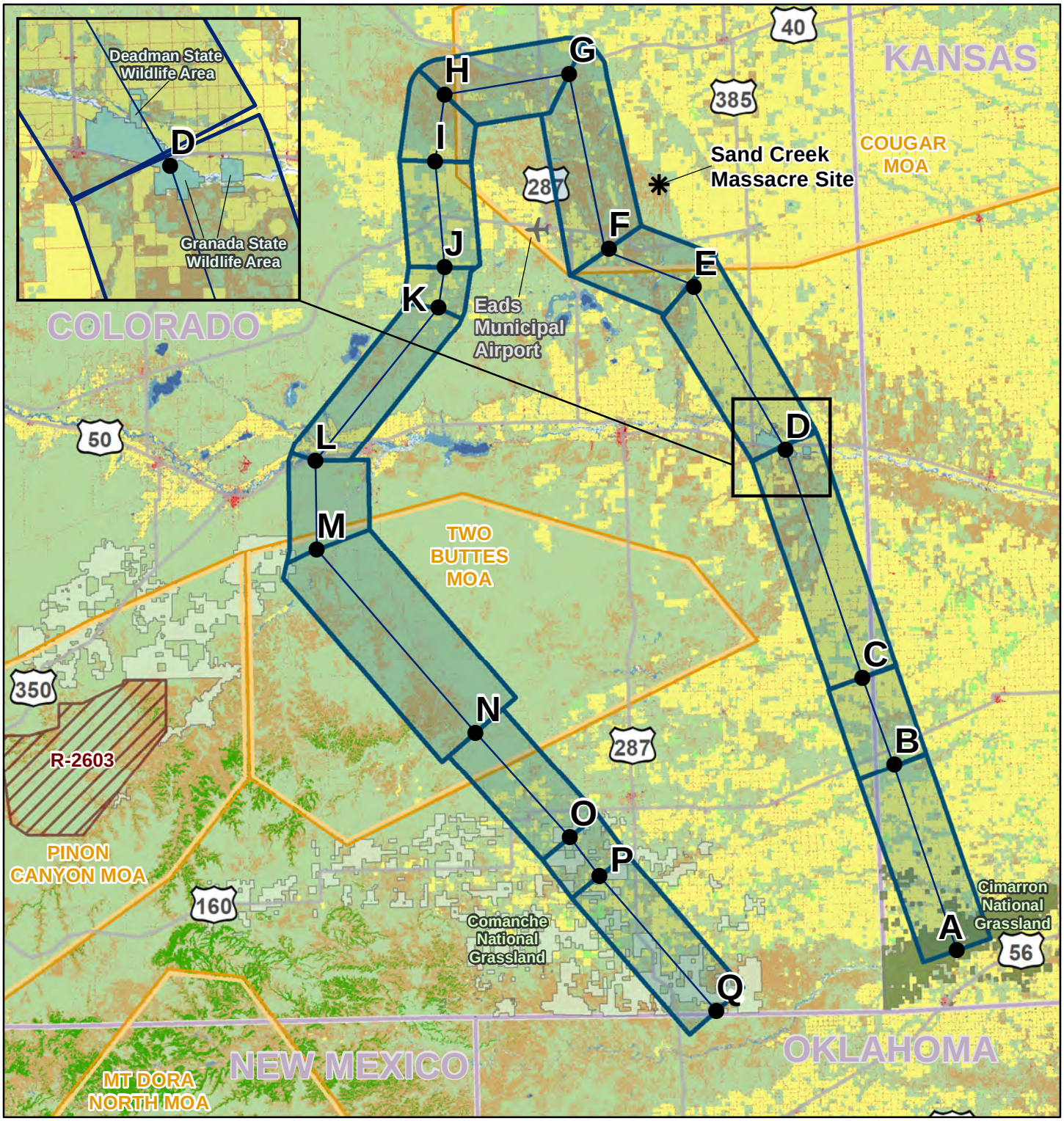


FIGURE 3-8

Land Use/Cover – Alternative 3

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- Cimarron National Grassland
- Colorado State Wildlife Area
- Comanche National Grassland
- Cultivated Crops
- Developed, Open Space
- Evergreen Forest
- Herbaceous
- Hay/Pasture
- IR-177 Proposed Airspace to Retain
- Shrub/Scrub

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

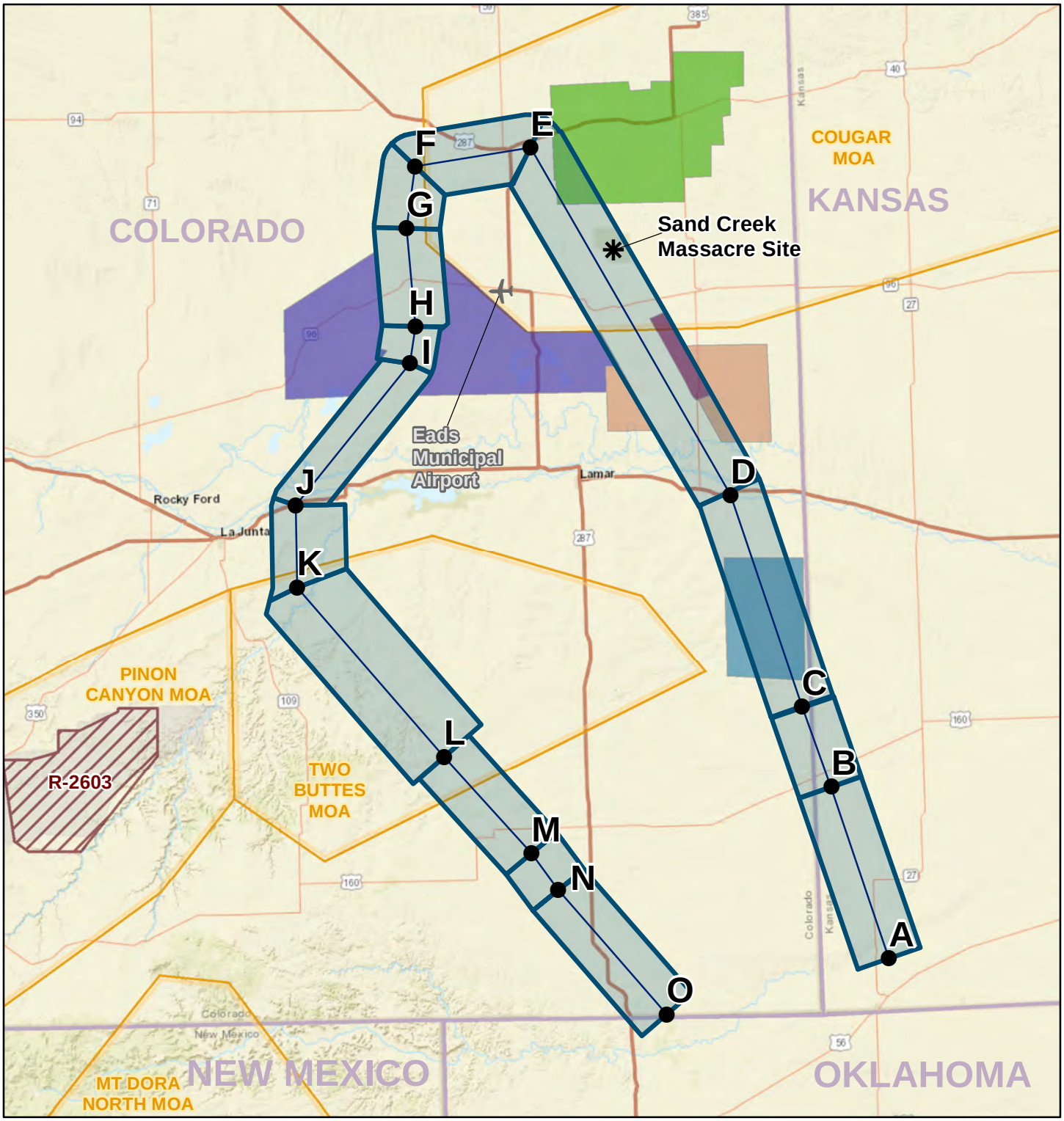


FIGURE 3-9

Wind Farm Mitigation Projects – Alternatives 1 and 2

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- Hartman Wind Mitigated Project Area
- Haswell Wind Mitigated Project Area
- IR-177 Proposed Airspace to Retain
- Kitwell Wind Mitigated Project Area
- Towner Wind Mitigated Project Area
- Wildhorse Wind Mitigated Project Area

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

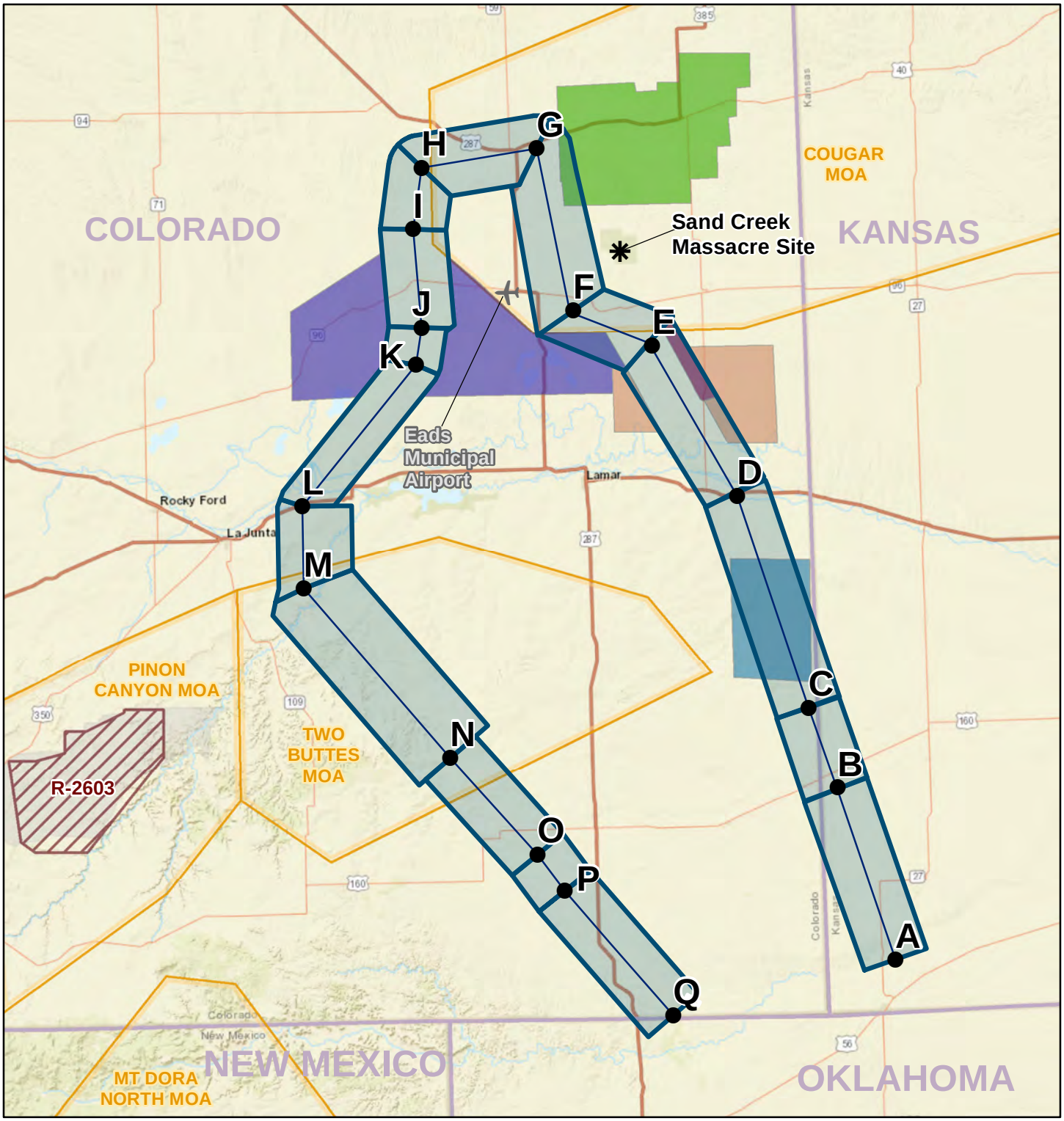


FIGURE 3-10

Wind Farm Mitigation Projects – Alternative 3

- IR-177 Waypoints
- Sand Creek Massacre Site
- Military Operations Areas
- Restricted Airspace
- Hartman Wind Mitigated Project Area
- Haswell Wind Mitigated Project Area
- IR-177 Proposed Airspace to Retain
- Kitwell Wind Mitigated Project Area
- Towner Wind Mitigated Project Area
- Wildhorse Wind Mitigated Project Area

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

Table 3-22.
IR-177 Wind Farm Mitigation Actions

Name	Description	Status
Towner Wind	Mitigated allowing 640' Turbines within 1.5 of eastern side of IR-177 MTR, to the south of the Sand Creek Massacre NHS.	Completed
Wildhorse Wind	Mitigated allowing 675' Turbines within 2 nm on the eastern side of IR-177 MTR.	Completed
Hartman Wind	Mitigated allowing a 1.5 nm corridor on eastern side of IR-177 MTR to construct turbines.	Completed
Haswell Wind	Mitigated to relocate Wind Turbine footprint outside IR-177 MTR corridor.	Completed
Wobbegong Wind	Under mitigation, requesting the developer to not build any of the 876 feet AGL proposed turbines north of new proposed Point B within IR-177 MTR.	Under Mitigation
Las Animas Wind	On hold for actions regarding 2023 wind turbines filed impacting two thirds of IR-177 MTR width (**Figure 3-9** points K–M and **Figure 3-8** points M–O).	On Hold
Orion Wind	Mitigation Response Team requested to mitigate 2022 filings for 660 feet AGL turbines impacting full width of IR-177 MTR (**Figure 3-9** points L–M and **Figure 3-10** points N–O).	On Hold
Firstview Wind	2022 filed wind project with effects on half of IR -177 MTR within a turn point (**Figure 3-9** point E and **Figure 3-10** point G)	On Hold

3.9.3 Environmental Consequences

3.9.3.1 Evaluation Criteria

Potential impacts to land use are based on the level of land use sensitivity in areas potentially affected by a proposed action as well as compatibility of the action with existing conditions. In general, a land use impact would be adverse if it meets one of the following criteria:

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

3.9.3.2 Alternative 1

Alternative 1 would have no impacts to land use except for insignificant impacts on the ability to site new wind farms in the areas below where the MTR would be utilized. Aircraft operations at a proposed floor of 300 feet AGL would be consistent with the largely rural and agricultural land uses underlying the MTR and would have no or minimal potential to affect or be noticeable to human populations in the ROI. Noise associated with the Proposed Action would not exceed 52dB, the equivalent of a quiet, suburban, residential area (see **Section 3.6**). The land under the MTR would be unaffected by the minor aircraft noise and therefore, would have no potential to require temporary or permanent changes to existing or proposed land uses, prevent the continued use and occupation of existing land uses, or result in incompatibilities with

existing or planned land use plans and policies. The frequency of proposed operations would not generate significant visual impacts during daytime operations, and any visible light during the limited proposed nighttime operations would be minimal.

Alternative 1 could make it more difficult to site new wind farms on the land under the IR-177 MTR. The DoD is supportive of renewable energy where it is compatible with the DoD mission. Under 10 USC § 183a, DoD must evaluate each siting proposal and meet with wind farm project developers to try to find feasible and affordable mitigation before objecting to a project. Because of the statutory mandate to try to reach compromise before objecting, the DAF cannot prejudge wind farm siting. The potential for overflight obstruction hazards is a shared concern for all aviation users, including the DoD, commercial, business, and general aviation users. As with any large vertical construction project, such as wind turbines, the DoD considers potential impacts of wind farm development on flight safety from obstructions introduced near DoD airfields, training ranges, and in areas used for military flight operations. In addition to the DoD Clearinghouse process, all structures constructed taller than 200 feet in height trigger a review from the FAA (through the Obstruction Evaluation / Airport, Airspace, Analysis process).

In most cases, the DoD Clearinghouse, through its mitigation response team process, finds a compromise in which turbines can proceed under air routes if some or many of the turbines are moved laterally or other types of mitigation strategies are implemented. The Proposed Action would not involve development activities or population changes that could require changes to existing or proposed land use. Therefore, significant impact to land use would not be anticipated with implementation of Alternative 1.

3.9.3.3 Alternative 2

Under Alternative 2, impacts to land use would be the same as those described for Alternative 1, except for minor differences in the potential for impacts on the ability to site new wind farms in the areas below the MTR would be utilized. The floor would not be standardized under Alternative 2, and there would be a lower likelihood of aircraft operations conflicting with exiting or proposed wind farms due to increased flight altitudes. Therefore, significant impact to land use would not be anticipated with implementation of Alternative 2.

3.9.3.4 Alternative 3 (Preferred Alternative)

Under Alternative 3, impacts to land use would be the same as those described for Alternative 1. Alternative 3 would have no impacts to land use, except for insignificant impacts on the ability to site new wind farms in the areas below where the MTR would be utilized. Therefore, significant impact to land use would not be anticipated with implementation of Alternative 3.

3.9.3.5 No Action Alternative

Under the No Action Alternative, the IR-177 MTR would not be utilized or reconfigured. There would be no change to the current land use underneath the IR-177 MTR beyond baseline conditions. Wind turbine development would continue to expand in the region and may limit the utilization of unused MTRs in the future. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.9.3.6 Cumulative Impacts

The Proposed Action would result in no adverse impacts to land use. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR-500 and 501 would occupy much of the same airspace as IR-177 in southeastern Colorado. The anticipated utilization of those IRs is not currently known, and because the NEPA process is in progress on this action, a draft EA has not been published. Due to the nature of the project, the anticipated impacts would be similar to those expected under the Proposed Action and the existing wind farm mitigation will

serve the same purpose under the Cannon AFB action. The Cheyenne MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace that could further impact land use. The Proposed Action, when considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, would not result in significant, adverse cumulative impacts to land use.

3.10 SOCIOECONOMICS

3.10.1 Definition of the Resource

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

The ROI for socioeconomics includes the Proposed Action area and the surrounding environs, which incorporates portions of Baca, Bent, Cheyenne, Kiowa, Las Animas, Otero, and Prowers counties in Colorado; portions of Morton, Stanton, and Hamilton counties in Kansas, and portions of Cimarron County in Oklahoma. **Figure 3-11 a**nd **3-12** show these counties in relation to the alternatives.

3.10.2 Existing Conditions

3.10.2.1 Population

All counties within the ROI declined in population between 2012 and 2022 (**Table 3-23**). The populations within Kansas and Oklahoma increased at a rate of 2.9 percent and 5.9 percent, respectively. This was slightly below the US growth rate of 7.1 percent. The state of Colorado saw a population increase during the same period of approximately 14.4 percent, which is greater than double the rate of growth of the US (US Census Bureau [USCB] 2012, 2022a).

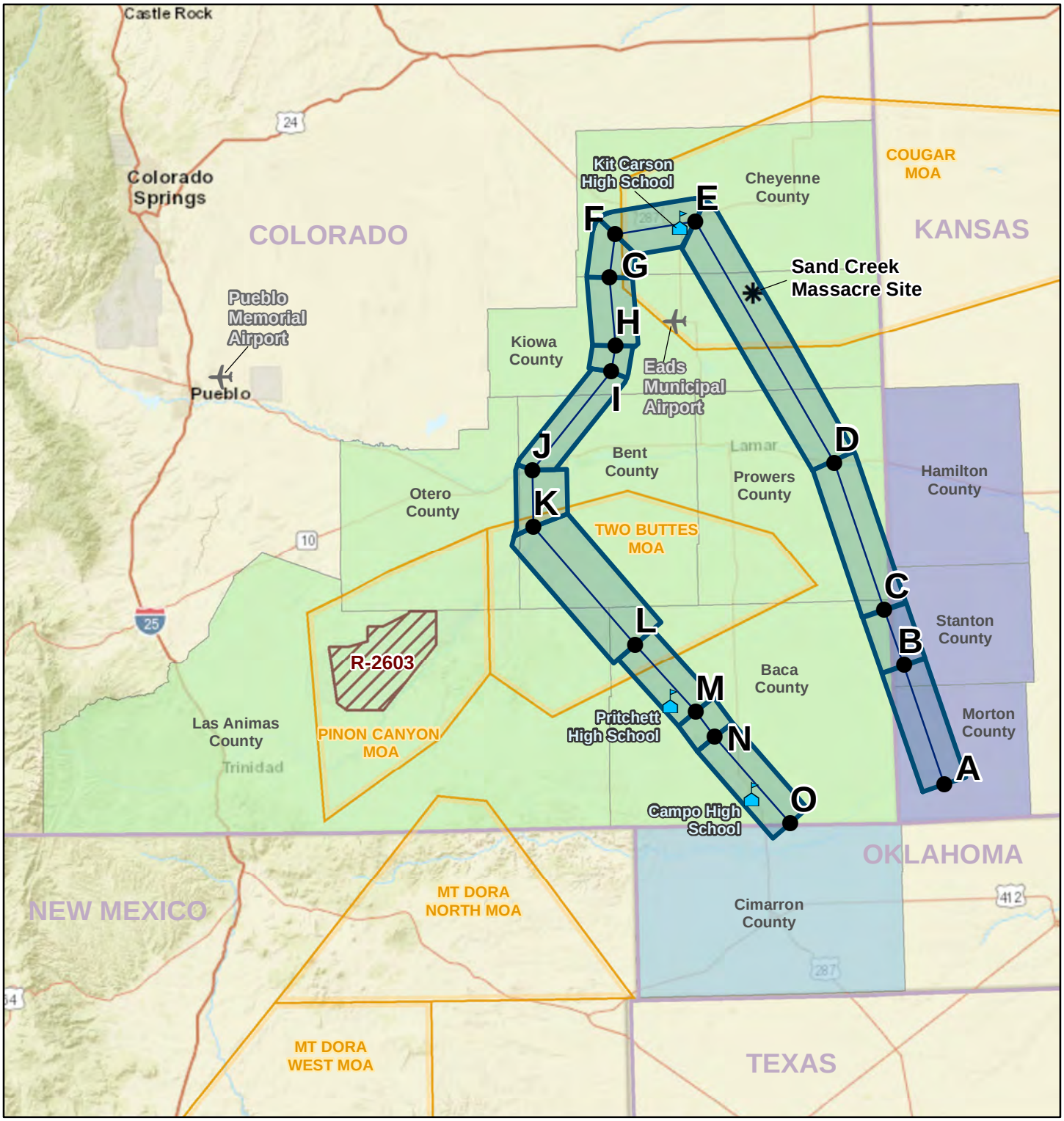


FIGURE 3-11

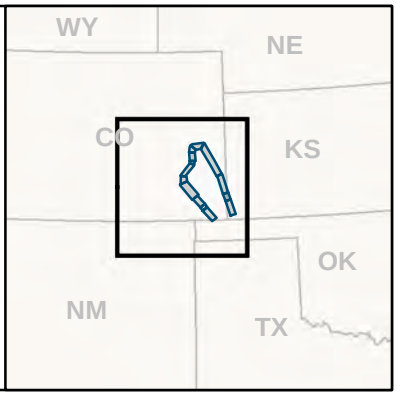
Counties Within the ROI – Alternatives 1 and 2

- IR-177 Waypoints
- Sand Creek Massacre Site
- School
- Military Operations Areas
- Restricted Airspace
- Colorado Counties
- IR-177 Proposed Airspace to Retain
- Kansas Counties
- Oklahoma Counties

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N



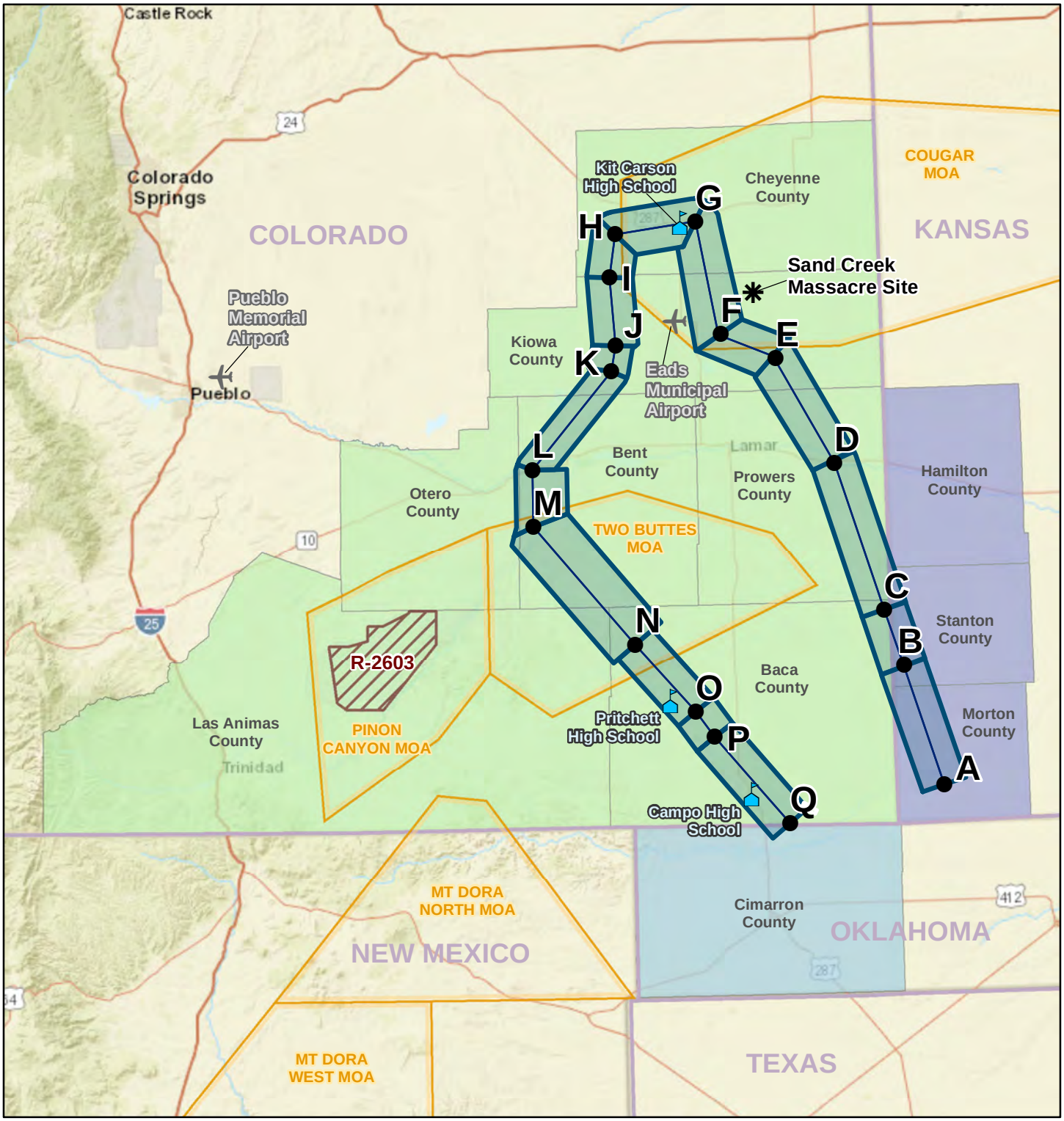


FIGURE 3-12
Counties Within the ROI – Alternative 3

- IR-177 Waypoints
- Sand Creek Massacre Site
- School
- Military Operations Areas
- Restricted Airspace
- Colorado Counties
- IR-177 Proposed Airspace to Retain
- Kansas Counties
- Oklahoma Counties

N

0 25 Miles

Coordinate System: WGM 1984 UTM Zone 13N

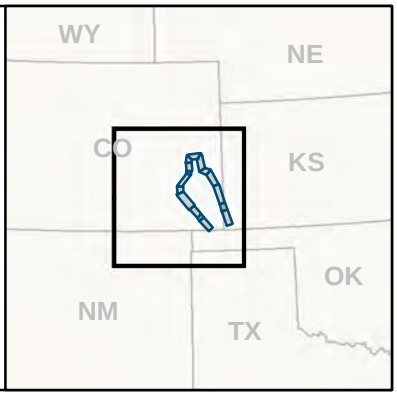


Table 3-23
Population Within the Region of Influence

Geographic Area	2012	2022	Total Growth 2012–2022 (percent)
United States	309,138,711	331,097,593	7.1
Colorado	5,042,853	5,770,790	14.4
Kansas	2,851,183	2,935,922	2.9
Oklahoma	3,749,005	3,970,497	5.9
Baca County, CO	3,783	3,496	-7.6
Bent County, CO	6,192	5,561	-10.2
Cheyenne County, CO	2,095	1,726	-17.6
Kiowa County, CO	1,393	1,347	-3.3
Las Animas County, CO	15,385	14,422	-6.3
Otero County, CO	18,791	18,580	-1.1
Prowers County, CO	12,539	11,968	-4.6
Hamilton County, KS	2,656	2,520	-5.1
Morton County, KS	3,207	2,688	-16.2
Stanton County, KS	2,200	2,060	-6.4
Cimarron County, OK	2,451	2,272	-7.3

Sources: USCB, 2012, 2022a

3.10.2.2 Employment

The unemployment rate across all 11 counties within the ROI was slightly lower than their respective state averages. Colorado (3.1%), Kansas (2.6%), and Oklahoma (2.9%) all have unemployment rates that are slightly lower than the national average (3.4%) (USCB, 2022b).

Table 3-24 summarizes the industries found in the ROI and the percent of the population working in those industries for the US and the states and counties in the ROI. Counties in the ROI demonstrate a greater proportion of their population who work within the agricultural industries. This is in line with the rural nature of the land underneath the Proposed Action and is reflected in the land use and ownership/leasing described in **Section 3.9**. Outside of Otero County, Colorado, which contains the cities of La Junta and Las Animas, the 10 remaining counties all have a smaller proportion of their population working within the manufacturing industry. These counties also have a smaller percentage of their working population within the professional, scientific, and management industries. This is likely due to a lack of large population centers within the ROI.

Table 3-24
Employment Industry Within the Region of Influence (percent of population)

Industry	United States	CO	KS	OK	Baca County, CO	Bent County, CO	Cheyenne County, CO	Kiowa County, CO	Las Animas County, CO	Otero County, CO	Prowers County, CO	Hamilton County, KS	Morton County, KS	Stanton County, KS	Cimarron County, OK
Agriculture, forestry, fishing and hunting, and mining	1.6	2.0	3.1	4.1	23.0	17.8	25.7	21.3	7.2	6.3	14.0	34.8	28.1	29.4	33.3
Construction	6.9	8.0	6.4	7.2	8.0	7.1	11.2	7.9	5.6	7.6	8.4	12.5	7.0	5.7	5.2
Manufacturing	10.0	7.0	12.4	9.4	4.2	2.6	0.3	2.2	3.0	11.0	4.4	3.3	1.5	1.6	0.7
Wholesale trade	2.4	2.3	2.5	2.3	0.7	0.8	3.0	0.3	1.6	1.1	1.4	1.0	9.2	10.0	0.6
Retail trade	11.0	10.5	10.6	11.8	6.1	8.7	6.4	10.2	10.1	10.9	10.5	4.3	3.6	4.1	23.3
Transportation and warehousing, and utilities	5.8	5.1	5.3	5.7	7.3	9.9	5.9	6.5	5.6	5.2	6.7	2.7	4.3	9.3	4.6
Information	1.9	2.7	1.7	1.5	0.3	4.0	1.0	2.2	2.0	2.2	0.7	0.7	1.8	1.1	1.2
Finance and insurance, and real estate and rental and leasing	6.7	7.2	6.5	5.5	4.8	3.7	5.0	4.8	5.8	2.8	2.4	6.3	1.3	6.6	4.6
Professional, scientific, and management, and administrative and waste management services	12.1	14.9	9.8	9.0	3.0	2.1	7.4	4.9	8.8	2.5	6.5	3.8	3.7	5.4	2.2
Educational services, and health care and social assistance	23.3	21.5	24.6	22.8	30.6	20.5	20.8	30.2	23.6	29.8	26.1	20.2	28.2	16.0	9.2
Arts, entertainment, and recreation, and accommodation and food services	9.0	9.5	8.0	9.4	1.3	9.3	3.4	4.0	12.1	8.9	8.1	6.5	1.5	0.3	3.8
Other services, except public administration	4.7	4.8	4.5	5.2	4.4	4.1	3.0	3.9	5.0	3.8	4.3	1.4	3.1	5.6	2.9
Public administration	4.7	4.5	4.6	6.2	6.5	9.5	6.8	1.8	9.7	7.9	6.5	2.5	6.6	4.8	8.4

Source: USCB, 2022b

3.10.2.3 Housing

USCB estimates show that housing vacancy rates in Colorado under the ROI are generally the same, or slightly lower, than the state and national averages, with the exception of Cheyenne and Otero counties (**Table 3-25**). Morton and Stanton counties in Kansas and Cimarron County in Oklahoma show a higher rental vacancy rate than the state and national levels. Vacant units are present in all counties within the ROI. The percentage of homes that are owner-occupied within the ROI is higher than the percentage of owner-occupied homes within each respective state and the entire US. The exception to this is Bent County, Colorado, which has a lower percentage of owner-occupied homes and a higher percentage of renters (USCB, 2022c).

Table 3-25
Housing Within the Region of Influence

Geographic Area	Total Units	Owner-occupied (%)	Renter-occupied (%)	Vacant Units	Homeowner Vacancy Rate (%)	Rental Vacancy Rate[b] (%)	Median Value[c] ($$)
United States	140,943,613	64.8	35.2	15,207,260	1.1	5.5	281,900
Colorado	2,500,095	66.2	33.8	222,051	0.8	5.1	465,900
Kansas	1,278,548	66.9	33.1	129,913	1.3	7.0	189,300
Oklahoma	1,751,802	65.9	34.1	229,091	1.4	7.3	170,500
Baca County, CO	1,985	73.7	26.3	399	0.7	7.8	119,700
Bent County, CO	2,151	61.6	38.4	343	1.8	0.7	110,700
Cheyenne County, CO	969	78.9	21.1	229	3.8	15.9	166,300
Kiowa County, CO	687	73.9	26.1	136	0.0	1.4	127,400
Las Animas County, CO	8,112	70.7	29.3	1,481	0.3	4.0	190,900
Otero County, CO	8,735	69.6	30.4	1,141	0.6	13.8	132.600
Prowers County, CO	5,473	71.0	29.0	966	1.1	7.8	120,200
Hamilton County, KS	967	77.5	22.5	251	2.5	3.3	116,800
Morton County, KS	1,321	73.2	26.8	382	3.9	30.2	96,000
Stanton County, KS	1,081	79.7	20.3	193	0.0	12.2	74,000
Cimarron County, OK	1,378	81.0	19.0	626	1.3	19.4	79,000

Source: USCB, 2022c
Notes:
a Homeowner vacancy rate is the proportion of the homeowner inventory that is vacant “for sale.”
b Rental vacancy rate is the proportion of the rental inventory that is vacant ‘for rent’.
c Median value of owner-occupied units.

3.10.2.4 Schools

Three schools fall within the ROI: Kit Carson School in Cheyenne County, Colorado, and Pritchett High School and Campo High School, both located in Baca County, Colorado (see **Figures 3-10** and **3-11**). The Kit Carson School covers all grades from kindergarten through the 12th grade and serves the rural community of approximately 300 people in Kit Carson, Colorado, with an enrollment of approximately 130 students (Kit Carson School, 2024). Baca County Schools, home of Pritchett and Camp High Schools, have more than 600 students spread across the 11 public schools (Baca County Schools, 2024). No other schools are located directly within the ROI.

3.10.3 Environmental Consequences

3.10.3.1 Evaluation Criteria

Consequences to socioeconomic resources were assessed in terms of the potential impacts on the local economy from implementation of the Proposed Action. The level of impact from expenditures associated

with the Proposed Action was assessed in terms of direct impacts on the local economy and related impacts on other socioeconomic resources (e.g., housing, employment). The magnitude of potential impacts can vary greatly depending on the location of an action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area but might have significant impacts in a rural region. In addition, if potential socioeconomic changes from a proposed action resulted in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, such effects might be considered adverse.

3.10.3.2 Alternative 1

Alternative 1 would lower the altitude floor to 300 feet AGL but would not involve any construction or demolition. Alternative 1 would not be anticipated to bring temporary construction workers to the region or generate revenue for the local economy through the purchase of materials and supplies. No new military or private-sector jobs would be generated as a result of implementation of Alternative 1, and no new personnel would be relocated to Altus AFB. Therefore, it would be anticipated that expenditures, employment, and population in the vicinity of the proposed IR-177 MTR would be unchanged and demand for school enrollment would be unaffected. Therefore, adverse impacts to socioeconomics would not be anticipated with implementation of Alternative 1.

3.10.3.3 Alternative 2

Potential impacts under Alternative 2 would be the same as Alternative 1. Alternative 2 would not result in temporary construction workers moving to the region or generate revenue for the local economy through the purchase of materials and supplies. No new jobs would be generated, no new personnel would be relocated to Altus AFB, and school enrollment would be unaffected due to the population remaining the same under Alternative 2. Therefore, adverse impacts to socioeconomics would not be anticipated with implementation of Alternative 2.

3.10.3.4 Alternative 3 (Preferred Alternative)

Potential impacts under Alternative 3 would be the same as Alternative 1. Alternative 3 would not result in temporary construction workers moving to the region or generate revenue for the local economy through the purchase of materials and supplies. No new jobs would be generated, no new personnel would be relocated to Altus AFB, and school enrollment would be unaffected due to the population remaining the same under Alternative 3. Therefore, adverse impacts to socioeconomics would not be anticipated with implementation of Alternative 3.

3.10.3.5 No Action Alternative

Under the No Action Alternative, the IR-177 MTR would not be utilized or reconfigured. There would be no changes or impacts to socioeconomic resources underneath the proposed IR-177 MTR beyond baseline conditions. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.10.3.6 Cumulative Impacts

The Proposed Action would result in no adverse impacts to socioeconomic resources. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and Reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR-500 and 501 would occupy much of the same airspace as IR-177 in southeastern Colorado. The anticipated utilization of those IRs is not currently known, but due to the nature of the project, the anticipated impacts to socioeconomic resources would be similar to those expected under the Proposed Action. The Cheyenne MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace that could further impact employment in the region. The Proposed Action, when considered in conjunction with the effects of other past, present,

and reasonably foreseeable actions near the IR-177 MTR, would not result in significant, adverse cumulative impacts to socioeconomics.

3.11 Environmental Justice and Protection of Children

3.11.1 Definition of the Resource

Federal agencies are directed by EOs to address disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to the legacy of racism or other structural or systemic barriers, in communities with environmental justice concerns (CEJCs) and assess environmental health and safety risks to children.

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

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All*, signed 21 April 2023, builds on and supplements the foundational efforts of EO 12898. It broadens the definition of environmental justice to include income, race, color, national origin, tribal affiliation, or disability. EO 14096 was enacted to strengthen the Federal Government's commitment to deliver environmental justice to all communities in the US via an ambitious approach that utilizes scientific research, high-quality data, and meaningful federal engagement with CEJCs, and that makes use of the tools available to the Federal Government, including enforcement of civil rights and environmental laws.

For the purposes of this analysis, populations that could constitute a CEJC, referred to in this analysis as "populations of concern" are defined as Alaska Natives and American Indians, Asians, Blacks or African-Americans, Native Hawaiians, and Pacific Islanders or persons of Hispanic origin (of any race); low-income populations include persons living below the poverty threshold as determined by the USCB; and youth populations are children under the age of 18 years.

The ROI for environmental justice and the protection of children includes the Proposed Action area and the surrounding environs, which incorporates portions of Baca, Bent, Cheyenne, Kiowa, Las Animas, Otero, and Prowers counties in Colorado; portions of Morton, Stanton, and Hamilton counties in Kansas, and portions of Cimarron County in Oklahoma.

3.11.2 Existing Conditions

Nationally, approximately 41.1 percent of the population identifies as a minority (**Table 3-26**). The states of Colorado (33.6%), Kansas (25.6%), and Oklahoma (36.1%) all contain a lower overall percentage of minority population compared to the national rate. Despite this, five counties within the ROI (four counties in Colorado and one in Kansas) have a minority rate higher than the national average. These same counties also contain an elevated Hispanic or Latino population when compared to state and national levels. Hamilton and Stanton counties, Kansas, and Cimarron County, Oklahoma, contain a higher Hispanic or

Latino population than Kansas, Oklahoma, and national levels, despite the overall minority population being consistent with state and national rates.

The percentage of the population living below the poverty level in counties within the ROI was generally in line with the respective state and national rates. In Colorado, six of the seven counties within the ROI showed higher poverty levels than both the state (9.6%) and national (12.5%) levels. Youth populations across the ROI were generally in line with the state and national rates, although a few counties had slightly elevated youth rates, as shown in **Table 3-26** (USCB, 2022d).

Table 3-26
Total Population and Populations of Concern

Area	Total Population	Percent Minority	Percent Hispanic or Latino	Percent Below Poverty	Percent Youth
United States	323,275,448	41.1	18.8	12.5	22.3
Colorado	5,653,289	33.6	22.1	9.6	21.7
Kansas	2,848,334	25.6	12.7	11.6	24.2
Oklahoma	3,847,702	36.1	11.6	15.2	24.2
Baca County, CO	3,391	17.4	11.9	**23.0**	22.5
Bent County, CO	4,234	**42.9**[c]	**31.9**	**27.1**	22.0
Cheyenne County, CO	1,683	19.5	11.5	10.9	**25.2**
Kiowa County, CO	1,317	7.7	6.1	**15.9**	**24.7**
Las Animas County, CO	13,791	**47.1**	**41.4**	**19.0**	18.9
Otero County, CO	18,130	**49.1**	**43.3**	**24.0**	23.5
Prowers County, CO	11,587	**44.1**	**40.4**	**17.6**	**26.1**
Hamilton County, KS	2,511	35.0	**33.9**	7.9	**30.4**
Morton County, KS	2,615	29.8	**24.2**	13.2	**26.3**
Stanton County, KS	2,030	**45.0**	**43.2**	13.2	24.7
Cimarron County, OK	2,253	30.2	**24.1**	10.9	24.4

Source: USCB 2022d
Notes:
a Hispanic and Latino denote a place of origin.
b The US Census Bureau categorizes all people under the age of 18 as “youth”; this EA uses “children” for the same group.
c Bolded text indicates percent higher than state/national averages.

3.11.3 Environmental Consequences

3.11.3.1 Evaluation Criteria

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

3.11.3.2 Alternative 1

The altitude floor would be lowered to 300 feet AGL, but no construction or ground-disturbing activities would occur under Alternative 1. Adverse impacts to air quality and noise are not anticipated. Noise would not exceed 52 dB, the equivalent of a suburban neighborhood. Further, implementation of Alternative 1

would not be anticipated to impact any schools or residential areas. Therefore, adverse impacts to CEJC and youth populations would not be anticipated with implementation of Alternative 1.

3.11.3.3 Alternative 2

Potential impacts under Alternative 2 would be the same as Alternative 1. Therefore, adverse impacts to CEJC and youth populations would not be anticipated with implementation of Alternative 2.

3.11.3.4 Alternative 3 (Preferred Alternative)

Potential impacts under Alternative 3 would be the same as Alternative 1. Therefore, adverse impacts to CEJC and youth populations would not be anticipated with implementation of Alternative 3.

3.11.3.5 No Action Alternative

Under the No Action Alternative, the IR-177 MTR would not be utilized or reconfigured. There would be no changes or impacts to potential CEJCs underneath the proposed IR-177 MTR. The availability of existing MTRs utilized by Altus AFB would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events. Altus AFB Aircrews would utilize existing MTRs in other geographic areas, and would continue to be limited by inclement weather, limiting training opportunities.

3.11.3.6 Cumulative Impacts

The Proposed Action would result in no adverse impacts to CEJCs. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts. The Cannon AFB utilization of IR-500 and 501 would occupy much of the same airspace as IR-177 in southeastern Colorado. The anticipated utilization of those IRs is not currently known, but due to the nature of the project, the anticipated impacts to socioeconomic resources would be similar to those expected under the Proposed Action. The Cheyenne MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace that could further impact employment in the region. The Proposed Action, when considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, would not result in significant, adverse cumulative impacts to CEJC and youth populations.

3.12 SAFETY AND OCCUPATIONAL HEALTH

3.12.1 Definition of the Resource

This section discusses safety and occupational health concerns associated with ground, explosives, and flight activities. Ground safety considers issues associated with ground operations and maintenance activities that support unit operations including arresting gear capability, jet blast/maintenance testing, and safety danger. Aircraft maintenance testing occurs in designated safety zones. Ground safety also considers the safety of personnel and facilities on the ground that may be placed at risk from flight operations in the vicinity of the airfield. Clear zones and accident potential zones around the airfield restrict the public's exposure to areas where there is a higher accident potential. Although ground and flight safety are addressed separately, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns.

Explosives safety relates to the management and safe use of ordnance and munitions. Flight safety considers aircraft flight risks such as midair collision, BASH, and in-flight emergency. Numerous federal, civil, and military laws and regulations govern operational safety for DAF units. Individually and collectively, these laws and regulations prescribe measures, processes, and procedures to ensure safe operations and to protect the public, military, and property. This EA evaluates elements of the Proposed Action with a

potential to affect safety to determine the degree to which such elements would increase or decrease safety risks.

The primary federal statute addressing occupational hazards is the *Occupational Health and Safety Act* (29 USC §§ 651–678) which created the Occupational Safety and Health Administration and National Institute for Occupational Safety and Health. Grand Forks County would be required to ensure the occupational health and safety of all personnel through implementation of DAFMAN 91-203, *Air Force Occupational Safety, Fire, and Health Standards* (2022), and DAFI 91-202, *The US Air Force Mishap Prevention Program* (2023), which implements AFPD 91-2, *Safety Programs* (2019).

The ROI for safety includes the area under the Proposed Action.

3.12.2 Existing Conditions

3.12.2.1 Ground and Flight Safety

The primary public concern with regard to ground and flight safety is the potential for aircraft accidents and the effects on the land below the mishap. Safety considerations addressed include crash response and fire risk management. Overall, the purpose of response planning is to:

- save lives, property, and material by timely and correct response to mishaps;
- quickly and accurately report mishaps to higher Headquarters; and
- investigate the mishap to preclude the reoccurrence of the same or a similar mishap.

Aircraft Mishaps

The primary public concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of midair collisions, collisions with man-made structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird/wildlife-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird/wildlife-aircraft strikes.

Aircraft mishaps and their prevention are of paramount concern to the DAF. The DAF defines four categories of aircraft mishaps: Classes A, B, C, and D as shown in **Table 3-27**. Class A mishaps are of primary concern because of their potentially catastrophic results. The DAF's current 2024 year to date mishap rate is approximately 1.68 mishaps per 100,000 flight-hours for Class A and 1.75 mishaps per 100,000 flight-hours for Class B (DAF, 2024). The C-17, which would be the primary aircraft utilizing the MTR, has a mishap rate of 1.47 per 100,000 flight-hours in FY 21 for both Class A and B mishaps.

Altus AFB maintains a Mishap Response Plan that provides guidance for actions to be taken immediately by agencies tasked to support flight, ground, or weapons safety mishap investigations and to ensure proper assembly and use of an Interim Safety Board. The plan, along with the Altus AFB Installation Emergency Management Plan, is designed to minimize loss of life, personal injury, and property damage.

Bird/Wildlife-Aircraft Strike Hazard

Bird-aircraft strikes constitute a safety concern because they can result in damage to aircraft or injury to Aircrews or local populations if they result in an aircraft crash. BASH concerns are described in greater detail in **Section 3.8.2.6**.

Wind Turbine Hazards

Wind turbines also pose a hazard to Aircrews during low-level training operations. Wind turbines can be constructed over 300 feet, and they can be a hazard to airframes at this altitude. The mitigation of wind farm development within the ROI is discussed in greater detail within **Section 3.9**.

Table 3-27.
Aircraft Class Mishaps

Mishap Class	Total Property Damage	Definition
A	≥ $2,500,000 and/or aircraft destroyed	• A fatality or permanent total disability • Destruction of a DoD aircraft • Permanent loss of primary mission capability of a space vehicle
B	< $2,500,000 ≥ $600,000	• A permanent partial disability • In-patient hospitalization of three or more personnel • Permanent degradation of primary or secondary mission capability of a space vehicle or the permanent loss of secondary mission capability of a space vehicle
C	< $600,000 ≥ $60,000	• Any injury or occupational illness that causes loss of one or more days away from work not including the day or shift it occurred • An occupational injury or illness resulting in permanent change of job • Permanent loss or degradation of tertiary mission capability of a space vehicle
D	< $60,000 ≥ $20,000	• Recordable injury or illness not otherwise classified as A, B, or C
E	N/A	• Certain occurrences that do not meet reportable mishap classification criteria but are deemed important to investigate/report for hazard identification and mishap prevention; Class E reports provide an expeditious way to disseminate valuable mishap prevention information

Source: DAF, 2024
DoD = US Department of Defense; N/A = not applicable

3.12.3 Environmental Consequences

3.12.3.1 Evaluation Criteria

Impacts from the Proposed Action are assessed according to the potential to increase or decrease safety risks to personnel, the public, property, or the environment. For the purposes of this EA, an impact is considered significant if DAF safety criteria are exceeded or if established or proposed safety measures are not being properly implemented, resulting in unacceptable safety risk to personnel.

3.12.3.2 Alternative 1

Altus AFB has the capability to provide crash response; this capability would remain in place under Alternative 1 which would lower the altitude floor to 300 feet AGL. In the unlikely event of a crash within the ROI, local first responders likely would be first on the scene given the distance from Altus AFB. Altus AFB crash response would continue to follow standard procedures and plans as described in **Section 3.12.2** of this EA. There would be no changes to crash-response procedures with implementation of Alternative 1.

It is impossible to predict the precise location of an aircraft accident. Major considerations in any accident are loss of life and damage to property. The Aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. The probability of an aircraft crashing into a populated area within the ROI is extremely low, but it cannot be totally discounted. Several factors are relevant: The location of the proposed IR-177 MTR to be retained and the immediate surrounding areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Should a mishap occur, response and recovery operations could require such activities as the use of motorized vehicles and excavation to contain contamination. When responding to a crash site, the DAF would consult with the appropriate land use manager to minimize direct damage and coordinate actions. Due to the myriad factors in such an occurrence, detailed steps cannot be foreseen. Each crash response would be considered on a case-by-case basis to minimize the intrusiveness to the maximum extent practicable, consistent with national security considerations and the need to protect life and property from further risk.

3.12.3.3 Alternative 2

Impacts to safety and the relevant procedures and protocols under Alternative 2 would be the same as Alternative 1.

3.12.3.4 Alternative 3 (Preferred Alternative)

Impacts to safety and the relevant procedures and protocols under Alternative 3 would be the same as Alternative 1.

3.12.3.5 No Action Alternative

Under the No Action Alternative, IR-177 would not be utilized or reconfigured by Altus AFB. There would be no potential for impacts to safety and no potential for aircraft mishaps or bird strikes within the ROI beyond baseline conditions. Altus Aircrews would utilize existing MTRs and would continue to be limited in the location and variety of training opportunities, as well as by inclement weather events.

3.12.3.6 Cumulative Impacts

Cumulative impacts to safety and occupational health from the Proposed Action would be expected to be minor. The Proposed Action was considered with the projects detailed under **Table 3-1**, which summarizes past, present, and reasonably foreseeable actions near the project area that could contribute to environmental impacts The Cannon AFB utilization of IR-500 and 501 would occupy portions of the same airspace as IR-177 in southeastern Colorado. Although the anticipated utilization of those IRs is not currently known, the MTR has capacity and is in locations with the dimensions necessary to support the flight activities proposed. The new flights introduced to this area from the Cannon AFB action would have the same impact and would be conducted under the same flight and ground safety protocols as the Proposed Action. The Cougar MOA action expanded the lateral boundaries of the operations area but did not result in any changes to the utilization of the airspace. The Proposed Action, when considered in conjunction with the effects of other past, present, and reasonably foreseeable actions near the IR-177 MTR, would not result in significant, adverse cumulative impacts to safety and occupational health.

CHAPTER 4 LIST OF PREPARERS

The following individuals assisted in the preparation of this Draft EA.

Nick Sutton
Environmental Assessment Services, LLC
NEPA and Compliance Program Manager
B.S., Biology
Years of Experience: 7
Contribution: Project Management, Safety and Occupational Health

Elyse Maurer, CFM
Environmental Assessment Services, LLC
Project Manager
B.A., Geography
Minors: GIS (certificate), Anthropology
Years of Experience: 8
Contribution: GIS

Tony Carnahan
Environmental Assessment Services, LLC
Project Manager
B.S., Biological Systems Engineering–Natural Resources
Years of Experience: 11
Contribution: Biological Resources

Raul Castillo
Stantec
Environmental Planner
M.S., Urban Planning
Years of Experience: 6
Contribution: Air Quality

Lesley Hamilton
Stantec
Environmental Scientist
B.A., Chemistry
Years of Experience: 36
Contribution: Air Quality Technical Review

Michael Harrison
Stantec
Environmental Scientist
M.S., Environmental Science
B.S., Biology
Years of Experience: 23
Contribution: Air Quality, Airspace Management, and Operational Noise Technical Review

Yuri Innis
Stantec
Airspace Analyst
M.S., Aeronautics
B.S., Professional Aeronautics
Years of Experience: 24
Contribution: Airspace Management

Violet Perry
Environmental Assessment Services, LLC
Environmental Planner
M.S., Urban Planning
AICP Candidate
B.S., Outdoor Adventure Leadership
Years of Experience: 2
Contribution: Socioeconomics, Environmental Justice and the Protection of Children, GIS

Derek Stadther
Stantec
Acoustic Engineer
M.Eng., Acoustics
B.S., Physics
Years of Experience: 12
Contribution: Operational Noise

Chris Swisher
Environmental Assessment Services, LLC
Project Manager
M.A., Applied Archaeology
B.A., Sociology & Anthropology
Years of Experience: 10
Contribution: Cultural Resources

Joanne Stover
Environmental Assessment Services, LLC
Technical Editor
B.S., Business Administration–Management
Years of Experience: 30
Contribution: Technical Editing and Document Production

Karin Volpe
Environmental Assessment Services, LLC
Environmental Planner
B.A., Urban Planning
Years of Experience: 3
Contribution: Land Use, GIS

4.1 GOVERNMENT CONTRIBUTORS

The following individuals contributed to this Draft EA.

Contributor	Organization/Affiliation
Heath Sirmons	97 CES/CEIE
Tom Gilbert	USACE/Tulsa District
D. Scott “Ox” Wilson	AETC
Major Corey Rotschafer	AETC
Robin Divine	AFCEC
Daniel Fisher	AFCEC
Major Ian Culpepper	Altus AFB
Dwain Klein	FAA
Lonnie Covalt	FAA

CHAPTER 5 REFERENCES

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APPENDIX A. INTERGOVERNMENTAL COORDINATION, PUBLIC AND AGENCY PARTICIPATION

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Mailing List

Nicole Alt
Colorado Ecological Services Supervisor
USFWS, Eastern Colorado Ecological Services Field Office
134 Union Boulevard
Lakewood, CO 80228

Jason Luginbill, Project Leader
USFWS, Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, KS 66502

Field Supervisor
USFWS, Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129

Amy Lueders, Regional Director
USFWS, Southwest Region
500 Gold Avenue Southwest
Albuquerque, NM 87102

Dale Ogden, Office Manager
Denver FSDO Office
26805 East 68th Avenue, Suite 200
Denver, CO 80249

Joseph Gonsalves, Manager
Wichita FSDO Office
1801 Airport Road, Suite 300
Wichita, KS 67209

David W. Cox, Office Manager
Will Rogers FSDO
1300 South Meridian, Suite 601
Oklahoma City, OK 73108

Grady Stone, Regional Administrator
FAA, Northwest Mountain Region
2200 South 216th Street
Des Moines, WA 98198

Joseph Miniace, Regional Administrator
FAA, Central Region
901 Locust Street
Kansas City, MO 64106

Rob Lowe, Regional Administrator
FAA, Southwest Region
10101 Hillwood Parkway
Fort Worth, TX 76177

Jared Polis, Governor of Colorado
Office of the Governor, State Capitol Building
200 East Colfax Avenue, Rm. 136
Denver, CO 80203

Laura Kelly, Governor of Kansas
Office of the Governer, Capitol
300 Southwest 10th Avenue, Suite 241S
Topeka, KS 66612

J. Kevin Stitt, Governor of Oklahoma
Office of Governer J. Kevin Stitt
2300 North Lincoln Boulevard, Suite 212
Oklahoma City, OK 73105

Jill Hunsaker Ryan, Executive Director
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246

Janet Stanek, Secretary
Kansas Department of Health and Environment
Office of the Secretary
1000 Southwest Jackson
Topeka, KS 66612

Scott Thompson, Executive Director
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73101

Heather Dugan, Acting Director
Colorado Parks and Wildlife Headqarters
6060 Broadyway
Denver, CO 80216

Brad Loveless, Secretary
Kansas Department of Wildlife and Parks
Office of the Secretary
1020 South Kansas, Rm. 200
Topeka, KS 66612

J.D. Strong, Director
Oklahoma Department of Wildlife Conservation
PO Box 53465
Oklahoma City, OK 73152

Mark Smith, Regional Administrator
US EPA Region 8, Mountains and Plains
1595 Wynkoop Street
Denver, CO 80202

Meg McCollister, Regional Administrator
US EPA Region 7, Midwest
11201 Renner Boulevard
Lenexa, KS 66219

Earthea Nance, Regional Administrator
US EPA Region 6, South Central
1201 Elm Street, Suite 500
Dallas, TX 75270

Bert Frost, Regional Director
National Park Service Region 5
601 Riverfront Drive
Omaha, NE 68102

Kate Hammond, Acting Regional Director
National Park Service Regions 6, 7 and 8
12795 West Alameda Parkway
Denver, CO 80225

Frank Beum, Regional Forester
US Forest Service, Rocky Mountain Region
1617 Cole Boulevard, Building 17
Lakewood, CO 80401

Ken Arney, Regional Forester
US Forest Service, Southern Region (R8)
1720 Peachtree Street, Northwest
Atlanta, GA 30309

Melanie Barnes, State Director
BLM, New Mexico State Office
301 Dinosaur Tail
Santa Fe, NM 87508

Doug Vilsack, State Director
BLM, Colorado State Office
2850 Youngfield Street
Lakewood, CO 80215

Lynda Ozan, Deputy SHPO
Oklahoma Historical Society
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

Dawn DiPrince, SHPO
State Historic Preservation Office - History Colorado
1200 Broadway
Denver, CO 80203

Mattew Chappell, SHPO
State Historic Preservation Office - Kansas Historical Society
6425 Southwest 6th Avenue
Topeka, KS 66615

Mark Wolfe, SHPO
State Historic Preservation Office - Texas Historical Commission
1511 Colorado Street
Austin, TX 78701

Jeff Pappas, SHPO
State Historic Preservation Office - New Mexico Historic Preservation Division
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe, NM 87501

Lloyd Goggles, Chairman
Northern Arapaho Tribe of the Wind River Reservation, Wyoming
P.O. Box 396
Fort Washakie, WY 82520

Ben Ridgley
Director, Tribal Historic Preservation Office
Northern Arapaho Tribe of the Wind River Reservation, Wyoming
P.O. Box 396
Fort Washakie, WY 82514

Serena Wetherelt, Acting President
Northern Cheyenne Tribe
P.O. Box 128
Lame Deer, MT 59043

Reggie Wassana, Governor
Cheyenne and Arapaho Tribes, Oklahoma
P.O. Box 38
Concho, OK 73022

Clyde M. Romero Sr., Governor
Taos Pueblo
P.O. Box 1846
Taos, NM 87571

Crystal Lightfoot
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

Dyan Youpee, THPO
Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation, Montana
P.O. Box 1027
Poplar, MT 59255

Max Bear, THPO
Cheyenne and Arapaho Tribes of Oklahoma
P.O. Box 38
Concho, OK 73022

Steve Vance, THPO
Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota
P.O. Box 590
Eagle Butte, SD 57625

Martina Minthorn, THPO
Comanche Nation of Oklahoma
P.O. Box 908
Lawton, OK 73502

Joshua Mann, THPO
Eastern Shoshone Tribe of the Wind River Reservation, Wyoming
P.O. Box 538
Fort Washakie, WY 82514

Garrie Killsahundred, THPO
Flandreau Santee Sioux Tribe of South Dakota
P.O. Box 283
Flandreau, SD 57028

Jeff Blythe, THPO
Jicarilla Apache Nation
P.O. Box 1367
Dulce, NM 87528

Phil Dupoint
Kiowa Tribe
P.O. Box 369
Carnegie, OK 73015

Teanna Limpy
Director, Tribal Historic Preservation Office
Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation
P.O. Box 128
Lame Deer, MT 59043

Thomas Brings, THPO
Oglala Sioux Tribe
P.O. Box 2070
Pine Ridge, SD 57770

Matt Reed, THPO
Pawnee Nation of Oklahoma
P.O. Box 470
Pawnee, OK 74058

Ione Quigley, THPO
Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota
P.O. Box 809
Rosebud, SD 57570

Dianne Desrosiers, THPO
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota
P.O. Box 509
Agency Village, SD 57262

Cassandra Atencio, Deputy THPO
Southern Ute Indian Tribe
P.O. Box 737
Ignacio, CO 81137

Kenneth Graywater, Jr., THPO
Spirit Lake Tribe, North Dakota
P.O. Box 198
Fort Trotten, ND 58335

Jon Eagle, THPO
Standing Rock Sioux Tribe of North & South Dakota
P.O. Box D
Fort Yates, ND 58538

Betsy Chapoose, Cultural Director
Ute Indian Tribe of the Uintah & Ouray Reservation
P.O. Box 190
Fort Duchesne, UT 84026

Terry Knight, THPO
Ute Mountain Ute Tribe
P.O. Box 248
Towaoc, CO 81334

Kelli Huapapi
Director, Tribal Historic Preservation Office
Yankton Sioux Tribe of South Dakota
P.O. Box 1153
Wagner, SD 57380

Katherine Hale
Executive Director
Altus Public Library
421 North Hudson Street
Altus, OK 73521

Brandon Gipson
Facility Manager
Altus AFB FSS Library
109 East Avenue
Altus AFB
Altus, OK 73523

Vicki Henderson, Director
East Cheyenne County Library District
P.O. Box 939
Cheyenne Wells, CO 80810

Nick McCarty-Daniels, Director
Burlington Public Library
321 14th Street, #1607
Burlington, CO 80807

Kemma Alfano, Director
Kiowa County Public Library
1305 North Goff Street
Eads, CO 81036

Vivian F. Schaal, Director
Flagler Community Library
311 Main Avenue
Flagler, CO 80815

Lucile Reimer, Director
Limon Memorial Library
P.O. Box 236
Limon, CO 80828

Jody O'Leary, Director
Combined Community Library, Main Branch
1007 Main Street
Ordway, CO 81063

Kristine Turner-Gonzalez, Librarian
Fowler Public Library
411 6th Street
Fowler, CO 81039

Heather Maes
Director of Library Services
Woodruff Memorial Library
522 Colorado Avenue
La Junta, CO 81050

Karen Leck, Director
Las Animas/Bent County Public Library District
306 5th Street
Las Animas, CO 81054

Sue Lathrop, Director
Lamar Public Library
102 East Parmenter Street
Lamar, CO 81052

Baca County Library
1260 Main Street
Springfield, CO 81073

Thayla Wright, Librarian
Arthur Johnson Memorial Library (Raton City Library)
244 Cook Avenue
Raton, NM 87740

Fred Macaron Public Library
600 Colbert Avenue
Springer, NM 87747

Albert W. Thompson Memorial Library
17 Chestnut Street
Clayton, NM 88415

Kinsey Nicholson, Director
Dallam-Hartley County Library
420 Denrock Avenue
Dalhart, TX 79022

Mellonee York, Director
Sherman County Public Library
719 North Main Street
Stratford, TX 79084

Soutar Memorial Library
4 South Ellis Avenue
Boise City, OK 73933

Blair Henson, Director
Guymon Public Library & Arts Center
1718 North Oklahoma Street
Guymon, OK 73942

Toni Jones Bressler, Director
Morton County Library
410 Kansas Street
Elkhart, KS 67950

Royce Kitts, Director
Liberal Memorial Library
519 North Kansas Avenue
Liberal, KS 67901

Mary Cooper, Director
Stanton County Library
P.O. Box 480
Johnson, KS 67855

Tammy Dickey, Director
Kearny County Library
101 Prairie Avenue
Lakin, KS 67860

Amy Brucker, Director
Hamilton County Library
102 West Avenue C
Syracuse, KS 67878

Sharon Van Allen, Head Librarian
Sharon Springs Public Library
P.O. Box 607
Sharon Springs, KS 67758

DEPARTMENT OF THE AIR FORCE
NINETEENTH AIR FORCE
JOINT BASE SAN ANTONIO-RANDOLPH

4 August 2023

Colonel Aaron B. Brown
Operations Support Chief
Directorate of Operations
Nineteenth Air Force
555 E Street, East Suite B1
JBSA Randolph AFB, TX 78150-4139

Mr. Byron Chew
Group Manager, Operations Support Group (AJV-W2)
Federal Aviation Administration
2200 South 216th St.
Des Moines, WA 98198

Dear Mr. Chew,

The Department of the Air Force (DAF) is initiating an Environmental Assessment (EA) for the proposed modification of Military Training Route (MTR) Instrument Route (IR)-177 to support C-17 aircraft training for Altus Air Force Base (AFB) Oklahoma. Accordingly, the DAF requests the Federal Aviation Administration (FAA) formally participate as a Cooperating Agency in the preparation of the EA, as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations, 40 CFR Part 1501.9, Cooperating Agencies.

Consistent with the CEQ regulations and the Department of Defense/FAA Memorandum of Understanding (MOU), FAA involvement as a Cooperating Agency would generally include the following actions:

1) Participating in the EA scoping, data gathering, analysis, and consultation processes.

2) Assuming responsibility, upon request, for developing information and preparing analyses on issues for which FAA has special expertise.

3) Making FAA staff support available to enhance interdisciplinary review capability in reviewing documents, correspondence, and/or surveys.

4) Responding in writing to this request.

The DAF will act as the Lead Agency for purposes of compliance with §7, Endangered Species Act (16 USC §1536); §106, National Historic Preservation Act (16 USC §470f); and similar regulatory consultation or coordination requirements. To avoid unnecessary delays in

the NEPA process, the DAF will provide appropriate information and related materials in a timely fashion and establish timelines for your agency to complete its review and respond promptly. Should you or your staff have further questions regarding this memo, our point of contact is Mr. D. Scott Wilson, 19 AF/A3OF, at (210) 652-5539 or david.wilson.123@us.af.mil.

Sincerely,

AARON B. BROWN, Colonel, USAF

U.S. Department
of Transportation
**Federal Aviation
Administration**

Air Traffic Organization
FAA Headquarters, Washington, DC

800 Independence Avenue, S.W.
Washington, DC 20591

August 8, 2023

Colonel Aaron B. Brown
Operations Support Chief
Directorate of Operations
Nineteenth Air Force
555 E Street, East Suite B1
JBSA Randolph AFB, Texas 78150-4139

Subject: Federal Aviation Administration (FAA) Acceptance of National Environmental Policy Act (NEPA) Cooperating Agency Status for Air Force Environmental Assessment

Dear Colonel Brown,

Thank you for your letter dated August 4, 2023, requesting that Federal Aviation Administration (FAA) act as a cooperating agency for the proposed modification of military training route (MTR) Instrument Route (IR) 177 to support the Department of the Air Force's (DAF) Environmental Assessment (EA) for proposed C-17 aircraft training at Altus Air Force Base (AFB), Oklahoma.

The FAA appreciates the DAF's recognition of our role as a cooperating agency in the evaluation of potential environmental impacts from the DAF's use of Special Use Airspace (SUA) and Special Activity Airspace (SAA) toward meeting its training and operational readiness requirements as required by the National Environmental Policy Act (NEPA) and its implementing regulations at 40 CFR Part 1500. Since this DAF project involves the proposed establishment, expansion and use of SUA and/or SAA, the FAA accepts the DAF's request to act as a cooperating agency per NEPA's requirements at 40 CFR Section 1501.8 regarding the roles of cooperating agencies.

FAA performs its role as a cooperating agency in accordance with the guidelines set forth in the 2019 Memorandum of Understanding (MOU) between FAA and Department of Defense (DoD) "Concerning Environmental Review of Special Use Airspace Actions" (Appendix 7 to FAA Order 7400.2P, Chapter 32), and in accordance with the NEPA regulations at 40 CFR Section 1501.8 on cooperating agencies, FAA's NEPA implementing Order 1050.1F, and FAA Order 7400.2P, Chapter 32, Appendix 8 – FAA Special Use Airspace Environmental Processing Procedures, which outlines the process by which the FAA works with the DoD as a cooperating agency on projects involving SUA. See, https://www.faa.gov/documentLibrary/media/Order/7400.2P_Basic_dtd_4-20-23--COPY_FINAL.pdf

https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.current/documentnumber/1050.1

The FAA's participation in the development of the DAF's EA and related NEPA documentation for this proposed action resides under the jurisdiction of the FAA's Western Service Center, Operations Support Group (OSG) in at 2200 South 216th Street, Des Moines, Washington 98198. Joseph Bert, the OSG's Environmental Team Manager, and a designated Environmental Protection Specialist, will coordinate with the DAF on NEPA document developments and reviews. The Western Service Center's Environmental Protection Specialist will be the primary point of contact for matters related to the development and review of the DAF's NEPA documentation for this project, including related airspace issues that will be tracked and coordinated by FAA Headquarters Airspace Regulations and Policy Group (AJV-P23).

While Appendix 8 of FAA Order 7400.2P indicates that the airspace review (see FAA Order 7400.2, Ch. 21, Section 3) and environmental impacts review should be conducted in tandem as much as possible, they are still separate review and approval processes. FAA's approval of either the DoD's aeronautical proposal or the DoD proponent's environmental impact analysis does not automatically indicate approval of the entire proposal. See link to FAA Order 7400.2P, Appendices 7 and 8, for additional details on coordination of NEPA documentation for projects involving the use of SUA between FAA and DoD.
https://www.faa.gov/documentLibrary/media/Order/7400.2P_Basic_dtd_4-20-23--COPY_FINAL.pdf

A copy of the DAF's request for the FAA's cooperating agency status and this reply are being forwarded to the Environmental Team Manager, Mr. Joseph Bert of the Western Service Center's Operations Support Group. Mr. Bert can be contacted at joseph.m.bert@faa.gov for coordination and review of the NEPA document(s). For general questions regarding NEPA document processing and coordination with the DoD, FAA's Service Centers, or FAA headquarters, please contact Paula Miller in the ATO/AJV-P23, Environmental Policy Team at paula.miller@faa.gov.

Sincerely,

X Paula M. Miller, EPS

Paula M. Miller
JD, Environmental Protection Specialist, AJV-P23

Paula M. Miller, JD, EPS
Airspace Environmental Policy Team, AJV P-23
Air Traffic Organization, Mission Support Services
Federal Aviation Administration

cc:

D. Scott Wilson, 19 AF/A3OF, 210-652-5539, david.wilson.123@us.af.mil
Joseph Bert, FAA, Environmental Team Manager, Western Service Center, Operations Support Group; joseph.m.bert@faa.gov
Lonnie Covalt, FAA, Environmental Protection Specialist, Western Service Center, Operations Support Group; Lonnie.d.Covalt@faa.gov
Andy Poppen, FAA, Environmental Protection Specialist, FAA HQ, Washington, DC; andrew.g.poppen@faa.gov

Federal Aviation Administration

Memorandum

Date: 09/25/2023

To: USAF, Altus Air Force Base

From: Dwain Klein, FAA AJV-W230, WSC Air Traffic Representative

Subject: FAA Aeronautical Review of the USAF Proposed IR-177 Amendments

Note: *This memo pertains to the aeronautical portion of the IR-177 proposal; environmental concerns are addressed separately.*

The USAF notified the FAA of their intent to repurpose/amend IR-177 with stated change including, but not limited to:

1) Elimination of one leg of the route.

2) Amending the lower altitude of several sections of the route to one standard altitude.

3) Moving the ground track of the route to circumnavigate the Sand Creek Massacre Historical Site.

The USAF asked the FAA to aeronautically review the proposal indicating they were open to other amendments of the route if the FAA field facilities determined additional amendments where necessary to minimize impacts the route presents to other users of the NAS.

The IR-177 route of flight progresses through 3 Air Route Traffic Control Centers; Kansas City Center (ZKC), Denver Center (ZDV), and Albuquerque Center (ZAB)

FAA Response:

Whereas IR-177 currently exists as a long-standing charted IR route, and IR-routes in general are not subject to NPRM processes, the centers did not perform a formal aeronautical review but have reviewed the proposed changes and explored possible mitigations where conflicts were identified.

The impact of IR-177 to surrounding airports and associated IFR procedures as identified below are valid of both the current IR-177 as established and would be equally valid of IR-177 if the amendments, as proposed, are completed. Adopting the proposed amendments will not add any new impacts to other NAS users; the potential for these impacts has always been there.

However, IR-177 has been inactive for several years, therefore, other NAS users (and the local controllers) are not accustomed to experiencing those impacts.

During the time IR-177 has been inactive, there has been an increased volume in other NAS traffic and therefore, although the aeronautical impacts to the surrounding airports and IFR procedures remain the same, when the route is re-activated, the impacts will be experienced more frequently than had been experienced in the past.

Additionally, because of the increase in other NAS traffic, the flyers of IR-177 may experience more frequent delays entering the route.

The FAA Enroute Centers listed above reviewed and evaluated the proposed changes to IR-177 for additional impacts to air traffic operations within their specific area of responsibility. Each facility utilized their airspace and procedures personnel as well as subject matter experts from local operations and determined the following:

ZKC identified impacts to IFR services at the ELKHART-MORTON COUNTY Airport at Elkhart, KS (KEHA) as a concern.

Impact: When IR-177 is active, IFR operations at KEHA would be suspended/delayed until the route is clear. Of special concern is that KEHA is a regional hub for medivac services and the medivac flights frequently utilize IFR procedures at KEHA and should be receiving priority handling.

Mitigation: ZKC proposed an AOA 7,000 feet MSL crossing altitude at a new point north of KEHA indicating that adding the new point and crossing altitude would allow uninterrupted IFR services at KEHA.

ZKC indicated that adding the new point and crossing altitude would satisfy all of ZKC's concerns, and ALTUS concurred with this mitigation.

ZAB reviewed and approved the proposed amendments with no objections.

ZDV performed an extensive review of the proposal, and with the help of WSC procedures specialist, identified the following concerns and discussed potential mitigations with ALTUS.

1) Proximity to the SOUTHEAST COLORADO Airport at Lamar, CO (KLAA).

Impact: IR-177 interferes with all but one IAP into KLAA and would potentially delay IFR services at the airport when in use.

The KLAA RNAV (GPS) RWY 18 approach is the only IAP that could be used while IR-177 is active. However, the IAP would require specific control instructions by the controller when issuing the approach clearance. The WIZGE IAF would be unusable, and an AOA crossing restriction will need to be assigned at OBOZU.

Mitigations:

- ZDV asked ALTUS if the top altitude of the route could be lowered to 6,000 AGL as doing so would minimize most of the impact of the route. ALTUS replied that lowering the top altitude as requested would make the route all but unusable and make training ineffective. This idea was discarded.

- ZDV asked about moving the route to the east side of the Sand Creek Site. ALTUS replied that the east side has wind farms that make moving the route to that area impractical. This idea was discarded.

- ZDV explored adding mandatory reporting points to the route so that ZDV would be able to resume full IFR services at the airport more expeditiously than waiting until the aircraft exited the entire IR route.

This idea was presented to ALTUS and during discussions it was determined that a VFR test run of the route would be required to determine if there is adequate radio coverage along the route for the crew to be able to comply with the mandatory reporting points.

The test was completed, and it was determined that there is adequate radio coverage.

In subsequent discussions, ZDV suggested that rather than require mandatory reporting points (ZDV only actually needs reports when there are IFR demands at the airport) that if the crew could continually monitor the ZDV local frequency as they fly the route, then ZDV could call the flight for a progress report if/when needed at any point on the route.

It was determined that adding a requirement for IR-177 flights to monitor the ZDV local frequency while on the route into the AP1B notes for IR-177 would satisfy ZDV's concerns, and ALTUS concurred with this mitigation.

2) Proximity to the LA JUNTA airport at La Junta CO (KLHX).

Impact: IR-177 interferes with all IFR procedures at KLHX.

Mitigations: Other than being able to obtain a progress report from the flight while in the IR route as mentioned above, it was determined that there are no other feasible mitigations for KLHX.

Therefore, when IFR procedures are in use at KLHX, entry into IR-177 must be delayed until the IFR traffic at KLHX is clear, and/or when IR-177 is active, then there will be a delay providing IFR services at KLHX until the route is clear.

However, IFR traffic count in and out of KLHX is low and the IFR procedures at KLHX are infrequently utilized. This was deemed acceptable to ZDV and the USAF.

Conclusion:

The FAA facilities aeronautically concur with the amendment of IR-177 by incorporating the mitigations and requirements listed above.

DEPARTMENT OF THE AIR FORCE
97TH AIR MOBILITY WING (AETC)
ALTUS AIR FORCE BASE OKLAHOMA

23 February 2024

MEMORANDUM FOR FAA, Northwest Mountain Region

FROM: 97th Air Mobility Wing
100 Inez Boulevard, Suite 1
Altus AFB OK 73523-5047

SUBJECT: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

1. The United States Air Force (Air Force), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for reactivation of Military Training Route (MTR) Instrument Route (IR)-177 at Altus Air Force Base (AFB), Oklahoma (**Attachment 1**). To consider possible environmental concerns, the Air Force is engaging early with all potentially affected resource agencies as it formulates the undertaking.

2. The 97th Air Mobility Wing at Altus AFB is requesting a reconfiguration of the IR-177 MTR, in cooperation with the FAA, for C-17 aircraft training out of Altus AFB. IR-177 is an established MTR that was previously managed by Dyess AFB, Texas, for B-1 bomber aircraft training but is currently inactive. Altus AFB is requesting the reconfiguration of the IR-177 airspace to use portions that align with current and future training requirements. Portions of the legacy IR-177 that would not be utilized for training would be returned to the National Airspace System. The Air Force is analyzing three alternatives for the Proposed Action in this EA.

Alternative 1:
Under Alternative 1, Altus AFB would request reconfiguration of the IR-177 MTR and standardize the floor altitude of the remaining route to 300 feet above ground level (AGL) to align with current and future training requirements. In addition, the portions of the MTR that would be retained would be renamed (**Attachments 2 and 3**).

Alternative 2:
Alternative 2 would be the same as Alternative 1, except that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL (**Attachment3**).

Alternative 3:
Alternative 3 would be the same as Alternative 1, except that the existing route segment J1 to K (renamed segment C to D) would be slightly modified to afford more maneuverability west of the Sand Creek Massacre National Historic Site while avoiding Eads Municipal Airport by 3 nautical miles (nm) (**Attachment 4**). The configuration of IR-177 under Alternative 3 would allow aircraft to avoid overflying or operating within a 5-nm buffer around the Sand Creek Massacre National Historic Site.

3. The EA will, as required by law and regulations, consider the potential impacts from implementation of the Proposed Action and Alternatives. The EA will assess the potential environmental consequences associated with the Proposed Action and Alternatives, including a No Action Alternative. Potential impacts identified during the initial planning stages include effects on airspace; air quality; noise; biological, cultural, and visual resources; land use, health and safety, and environmental justice and protection of children. The EA also will examine the cumulative effects when combined with past, present, and reasonably foreseeable environmental trends and planned actions in the vicinity of IR-177. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EA.

4. We intend to notify your agency when the Draft EA is completed and welcome comments and input at that time as well. Please inform us if someone else within your agency other than you should receive such notification.

5. So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response no later than 30 days from receipt of this correspondence. Please send your response via postal mail or email (preferred) to:

ATTN: Mr. Heath Sirmons
97 CES/CEIE
401 L Avenue
Altus Air Force Base, OK 73523
Email: jimmy.sirmons@us.af.mil
Phone: 580-481-7647

6. The Air Force appreciates your interest in and support of its military mission. We thank you in advance for your assistance and look forward to your response.

Sincerely,

MARSHALL.JEFFREY.M.
1125862108

JEFFREY M. MARSHALL, Colonel, USAF
Commander

Attachments:
1. Map of Altus AFB and IR-177 Vicinity
2. Legacy and Proposed IR-177 MTR
3. Proposed Alternative 1 and 2 End State of IR-177 MTR
4. Proposed Alternative 3 End State of IR-177 MTR

DEPARTMENT OF THE AIR FORCE
97TH AIR MOBILITY WING (AETC)
ALTUS AIR FORCE BASE OKLAHOMA

23 February 2024

MEMORANDUM FOR Northern Arapaho Tribe of the Wind River Reservation, Wyoming

FROM: 97th Air Mobility Wing
100 Inez Boulevard, Suite 1
Altus AFB OK 73523-5047

SUBJECT: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

Dear Chairman Goggles

1. The United States Air Force (Air Force), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for reactivation of Military Training Route (MTR) Instrument Route (IR)-177 at Altus Air Force Base (AFB), Oklahoma. To consider possible environmental concerns and pursuant to Section 106 of the *National Historic Preservation Act* (NHPA) and implementing regulations at 36 CFR Part 800, the Air Force would like to initiate government-to-government consultation with the Northern Arapaho Tribe of the Wind River Reservation, Wyoming on the following potential undertaking.

2. Altus AFB is home to the 97th Air Mobility Wing, which serves as the Air Force's Combat Mobility and Expeditionary Training Center for Excellence. As such, the Base's mission is to train exceptional Aircrew by expertly training them to meet and support essential Air Force deployment capabilities worldwide. In order to facilitate this training, the Air Force is requesting a reconfiguration of the IR-177 MTR, in cooperation with the FAA, for future C-17 aircraft training exercises originating from Altus AFB.

3. Altus AFB initially has determined that the area of potential effects (APE) will be the boundaries of the existing IR-177 MTR. The IR-177 MTR is located approximately 277 miles northwest of Altus AFB and covers approximately 7,381 square miles across southeastern Colorado, southwestern Kansas, northwestern Oklahoma, northwestern Texas, and northeastern New Mexico (**Attachment 1**).

4. In accordance with the *National Environmental Policy Act* (NEPA), the Air Force is analyzing three alternatives for its proposal for reconfiguration of IR-177. Upon identification of the Preferred Alternative, the Air Force will move forward with the NHPA Section 106 review and consultation process concurrently with the NEPA process. The NEPA process will help to further define the undertaking and determine potential alternatives through early engagement with stakeholders and consulting parties.

5. The 97th Air Mobility Wing at Altus AFB is requesting the reconfiguration of the IR-177 MTR for C-17 aircraft training out of Altus AFB. IR-177, which is currently inactive, is an established MTR that was previously managed by Dyess AFB, Texas, for B-1 bomber aircraft training. Altus AFB proposes to reconfigure the IR-177 MTR to use portions that align with current and future training requirements. Portions of the legacy IR-177 MTR that would not be utilized for training would be returned to the National Airspace System. The three alternatives are briefly defined below.

Alternative 1:
Under Alternative 1, Altus AFB would reconfigure and repurpose the IR-177 MTR and standardize the floor altitude of the remaining route to 300 feet above ground level (AGL) to align with current and future training requirements. In addition, the portions of the MTR that would be retained would be renamed (**Attachments 2** and **3**).

Alternative 2:
Alternative 2 would be the same as Alternative 1, except that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL (**Attachment 3**).

Alternative 3:
Alternative 3 would be the same as Alternative 1, except that the existing route segment J1 to K (renamed segment C to D) would be slightly modified to afford more maneuverability west of the Sand Creek Massacre National Historic Site while avoiding Eads Municipal Airport by 3 nautical miles (nm) (**Attachment 4**). The configuration of IR-177 under Alternative 3 would allow aircraft to avoid overflying or operating within a 5-nm buffer around the Sand Creek Massacre National Historic Site.

6. Please advise if you would like to participate as a consulting party to identify any historic properties, including Traditional Cultural Properties within or adjacent to the APE, or present any concerns you might have regarding this undertaking. A list of consulting parties invited to participate in this consultation is included for your information (**Attachment 5**). We hope that you will be able to join us for this important discussion and greatly value your participation. Please contact my point of contact via mail, telephone, or email with questions or comments:

ATTN: Mr. Heath Sirmons
97 CES/CEIE
401 L Avenue
Altus Air Force Base, OK 73523
Email: jimmy.sirmons@us.af.mil
Phone: 580-481-7647

7. We respectfully request return of your comments within 30 days of the receipt of this correspondence. We intend to notify you when the Draft EA is completed and welcome comments and input at that time as well. Please inform us if someone else should receive such notification.

Sincerely,

MARSHALL.JEFFREY.M.
1125862108

JEFFREY M. MARSHALL, Colonel, USAF
Commander

Attachments:
1. Map of Altus AFB and IR-177 Vicinity
2. Legacy and Proposed IR-177 MTR
3. Proposed Alternative 1 and 2 End State of IR-177 MTR
4. Proposed Alternative 3 End State of IR-177 MTR
5. Consulting Parties Invited

DEPARTMENT OF THE AIR FORCE
97TH AIR MOBILITY WING (AETC)
ALTUS AIR FORCE BASE OKLAHOMA

23 February 2024

MEMORANDUM FOR State Historic Preservation Office - Texas Historical Commission

FROM: 97th Air Mobility Wing
100 Inez Boulevard, Suite 1
Altus AFB OK 73523-5047

SUBJECT: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

1. The United States Air Force (Air Force), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for reactivation of Military Training Route (MTR) Instrument Route (IR)-177 at Altus Air Force Base (AFB), Oklahoma. To consider possible environmental concerns and pursuant to Section 106 of the *National Historic Preservation Act* (NHPA) and implementing regulations at 36 CFR Part 800, the Air Force would like to initiate NHPA Section 106 consultation with the Texas State Historic Preservation Office (SHPO) on the potential undertaking.

2. Altus AFB is home to the 97th Air Mobility Wing, which serves as the Air Force's Combat Mobility and Expeditionary Training Center for Excellence. As such, Base's mission is to train exceptional Aircrew by expertly training them to meet and support essential Air Force deployment capabilities worldwide. In order to facilitate this training, the Air Force is proposing to reactivate the MTR for future C-17 aircraft training exercises originating from Altus AFB.

3. Altus AFB initially has determined that the area of potential effects will be the boundaries of the existing IR-177 MTR. The MTR is located approximately 277 miles northwest of Altus AFB and covers approximately 7,381 square miles across southeastern Colorado, southwestern Kansas, northwestern Oklahoma, northwestern Texas, and northeastern New Mexico (Attachment 1).

4. In accordance with the National Environmental Policy Act (NEPA), the Air Force is analyzing three alternatives for its proposal to reactivate the IR-177 MTR. Upon identification of the Preferred Alternative, the Air Force will move forward with the NHPA Section 106 review and consultation process concurrently with the NEPA process. The NEPA process will help to further define the undertaking and determine potential alternatives through early engagement with stakeholders and consulting parties.

5. The 97th Air Mobility Wing at Altus AFB requests to reconfigure the IR-177 MTR , in cooperation with the FAA, for future C-17 aircraft training exercises originating from Altus AFB. The IR-177 MTR, which is currently inactive, is an established MTR that was previously managed by Dyess AFB, Texas, for B-1 bomber aircraft training. Altus AFB requests to reconfigure the IR-177 MTR to use portions that align with current and future training requirements. Portions of the legacy IR-177 MTR that would not be utilized for training would be returned to the National Airspace System. The three alternatives are briefly defined below:

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6. Please advise if you would like to participate as a consulting party as we move forward with the NEPA and NHPA Section 106 processes. A list of consulting parties invited to participate in this consultation is included for your information (**Attachment 5**). We hope that you will be able to join us for this important discussion and greatly value your participation. Please direct any correspondence or inquiries via mail or email (preferred) to:

ATTN: Mr. Heath Sirmons
97 CES/CEIE
401 L Avenue
Altus Air Force Base, OK 73523
Email: jimmy.sirmons@us.af.mil
Phone: 580-481-7647

7. We respectfully request return of your comments within 30 days of the receipt of this correspondence. We intend to notify the Texas SHPO when the Draft EA is completed and welcome comments and input at that time as well. Please inform us if someone else within your organization other than you should receive such notification.

Sincerely,

MARSHALL.JEFFREY.M.
1125862108

JEFFREY M. MARSHALL, Colonel, USAF
Commander

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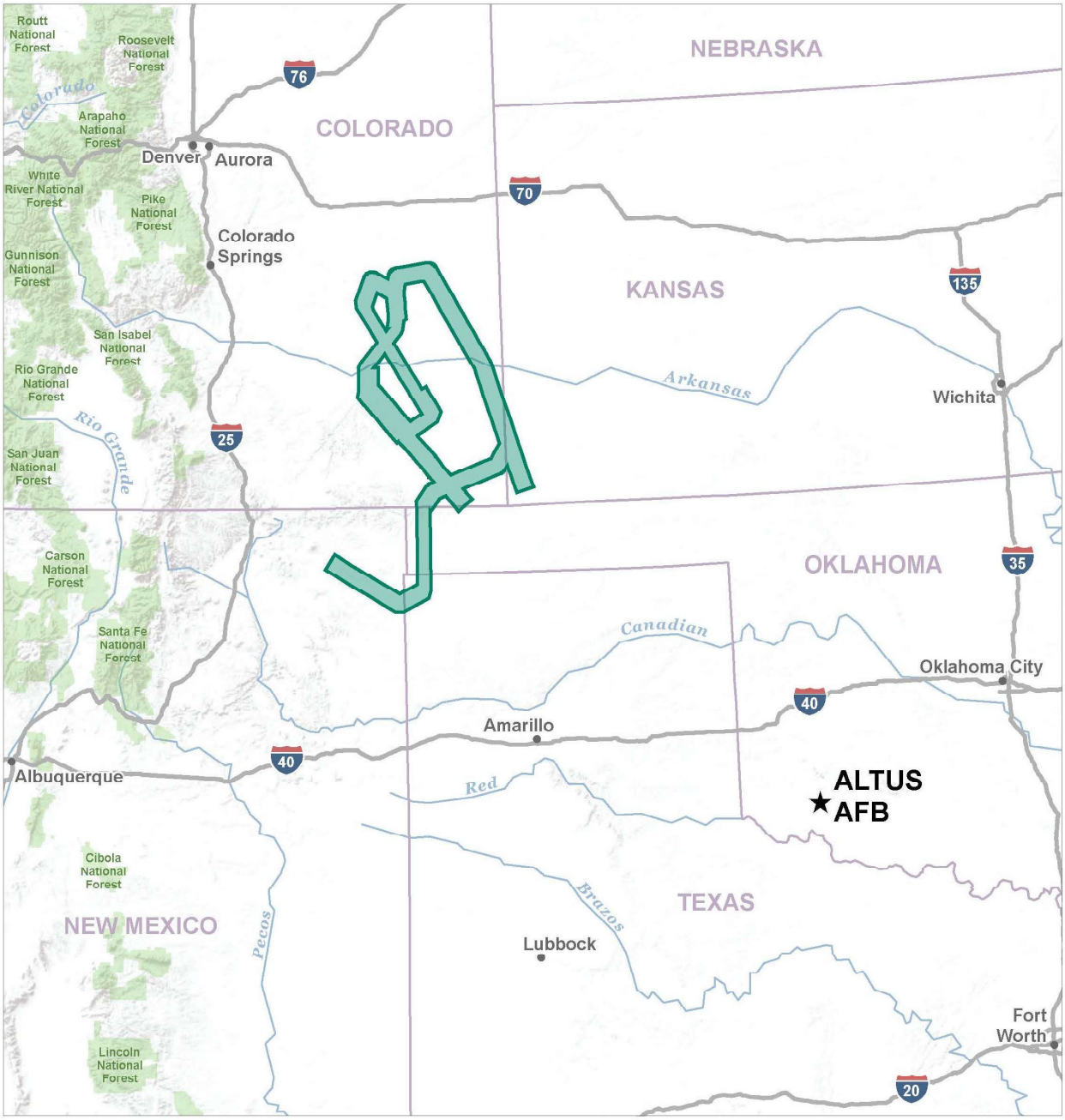
1. Map of Altus AFB and IR-177 Vicinity
2. Legacy and Proposed IR-177 MTR
3. End State of IR-177 MTR – Alternatives 1 and 2
4. End State of IR-177 MTR – Alternative 3
5. Consulting Parties Invited

Attachment 1 – Map of Altus AFB and IR-177 Vicinity



ATTACHMENT 1
Altus AFB and IR-177 Vicinity

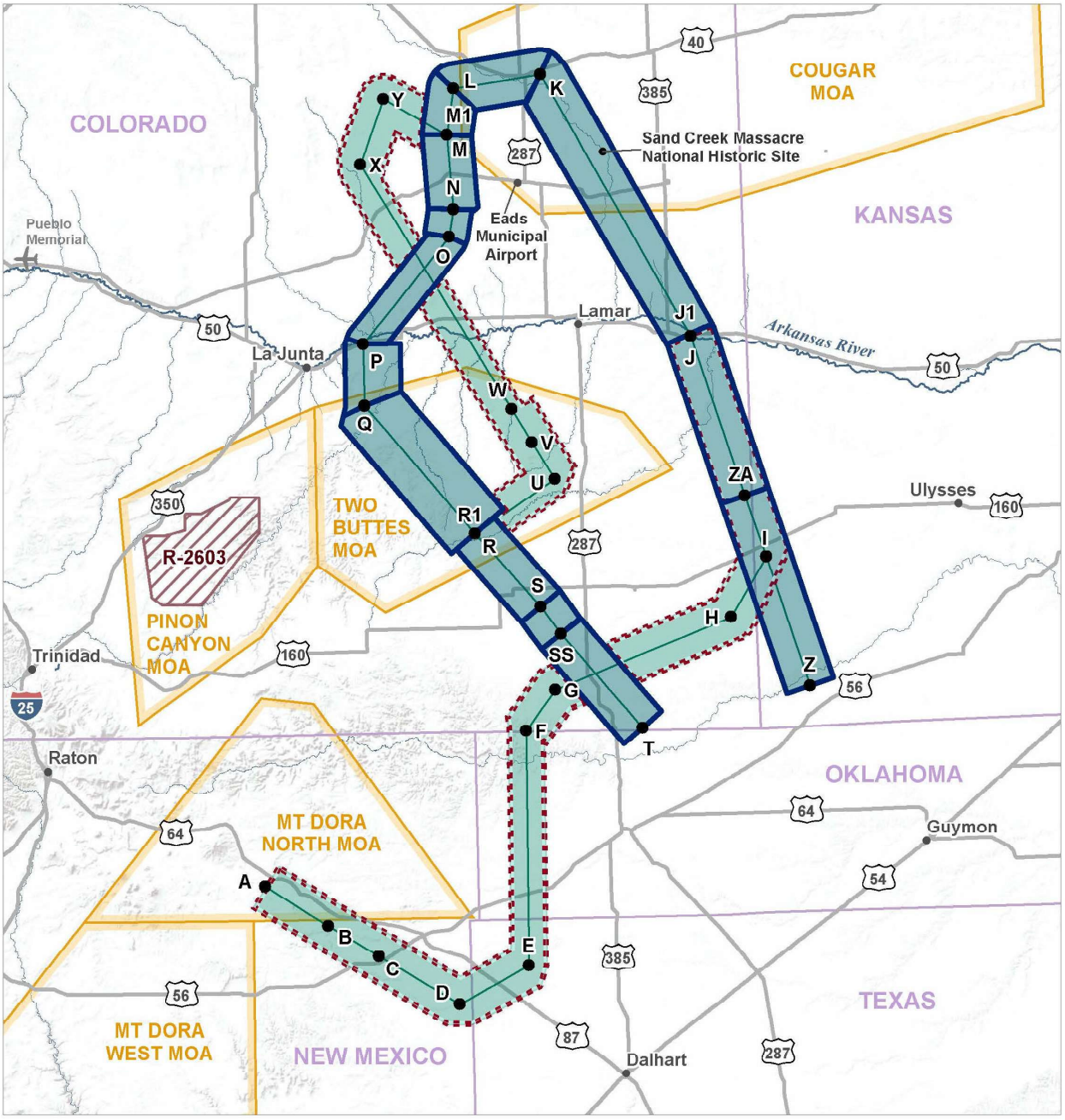
IR-177 Existing Airspace

N

0 100 Miles

Coordinate System: NAD 83 UTM Zone 13N

Attachment 2 – Existing Legacy and Proposed IR-177 Airspace



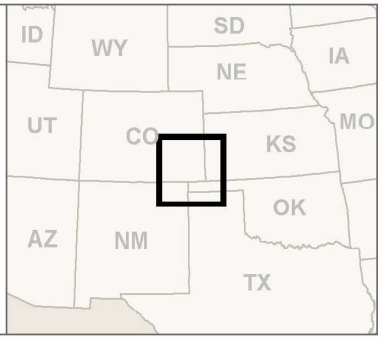
ATTACHMENT 2
Existing Legacy and Proposed IR-177 Airspace

- IR-177 Waypoints
- IR-177 Airspace to be returned to National Airspace System
- IR-177 Proposed Airspace to retain
- Military Operations Areas
- Restricted Airspace
- IR-177 Existing Airspace

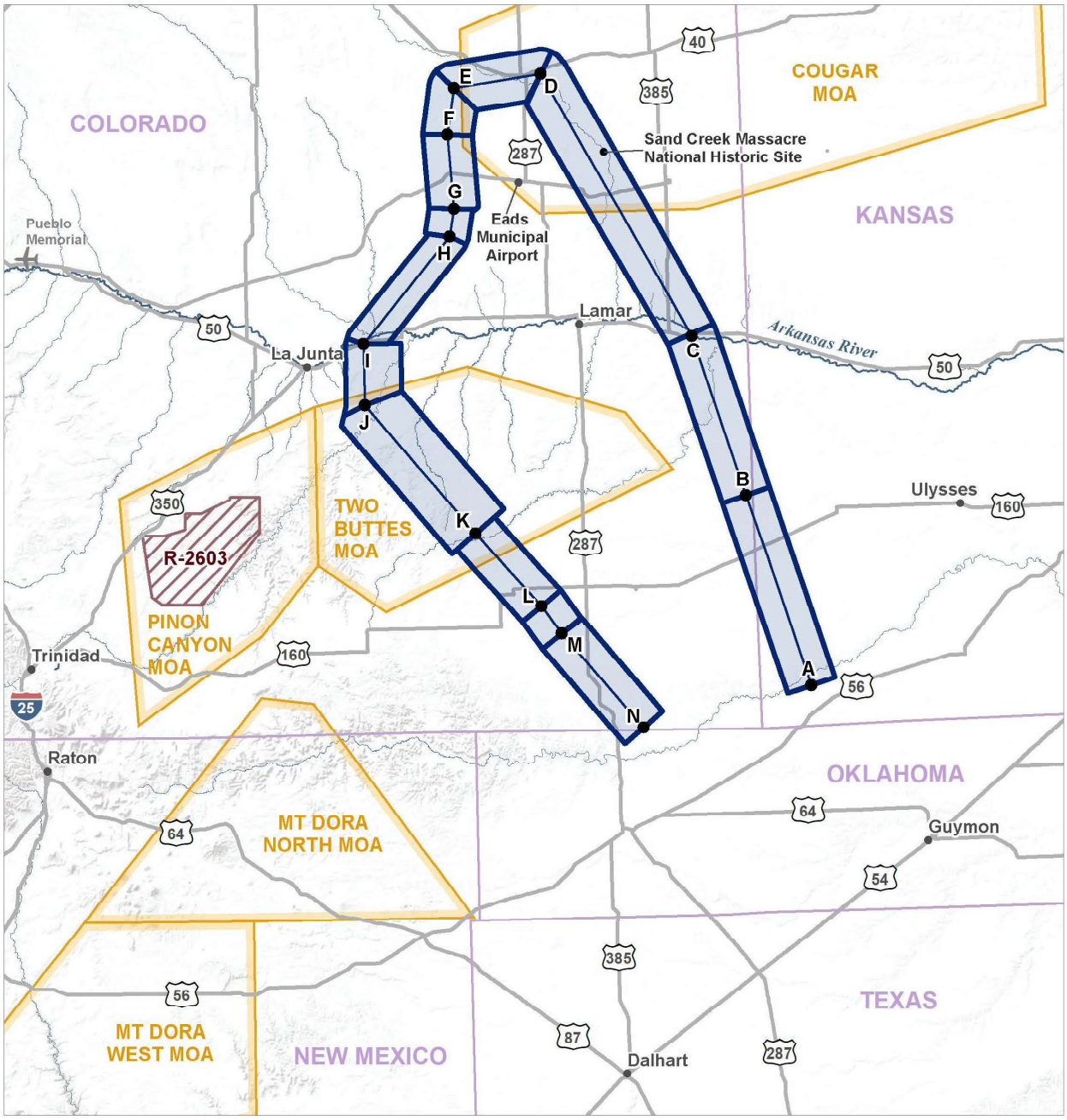
N

0 25 Miles

Coordinate System: NAD 83 UTM Zone 13N



Attachment 3 – End State of IR-177 Airspace – Alternatives 1 and 2



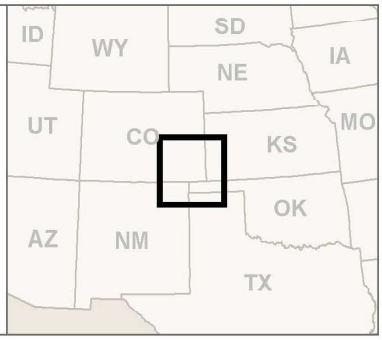
ATTACHMENT 3
End State of IR-177 Airspace – Alternatives 1 and 2

- IR-177 Waypoints
- IR-177 Proposed Airspace to retain
- Military Operations Areas
- Restricted Airspace

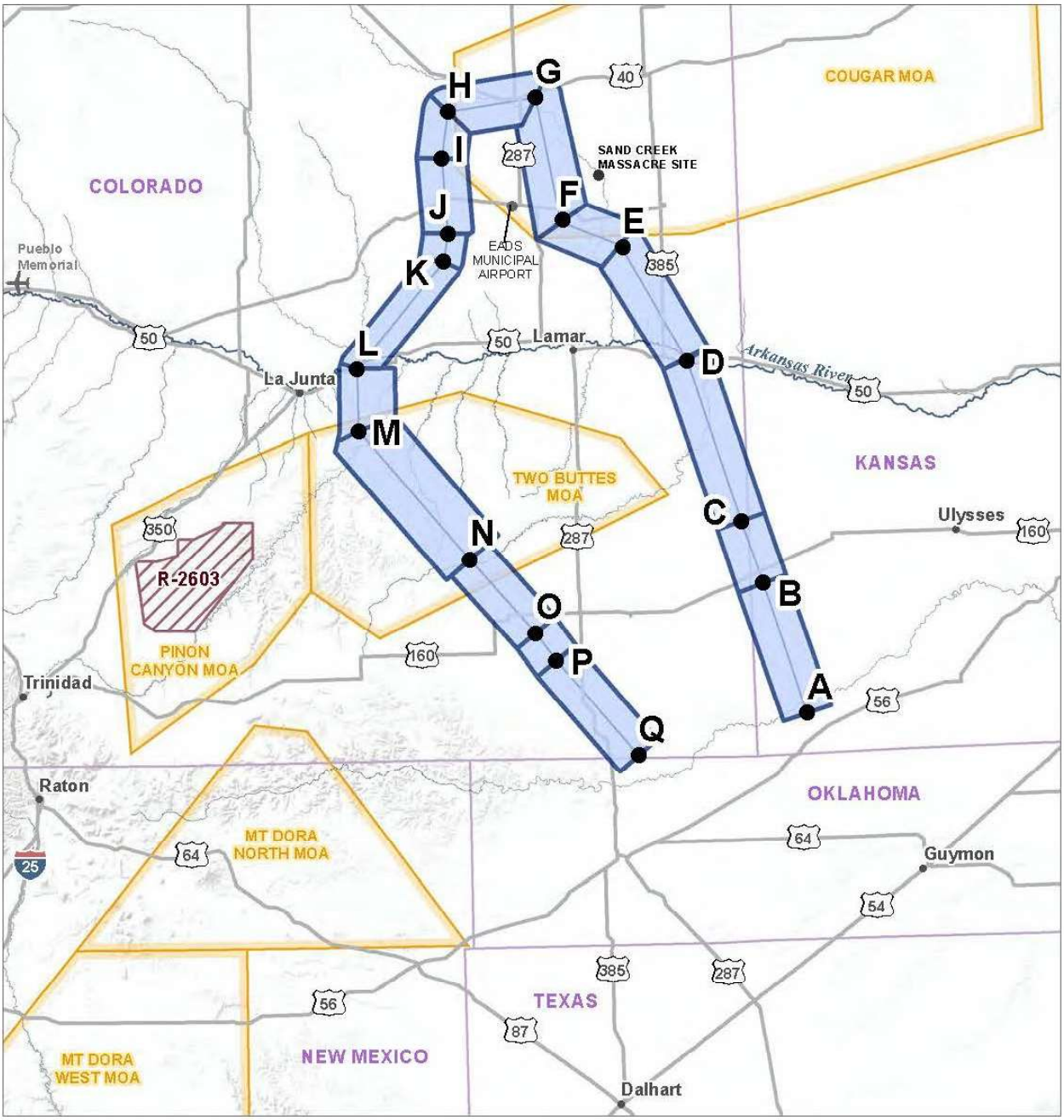
N

0 25 Miles

Coordinate System: NAD 83 UTM Zone 13N



Attachment 4 – End State of IR-177 MTR – Alternative 3



ATTACHMENT 4
End State of IR-177 MTR – Alternative 3

- IR-177 Waypoints
- IR-177 Proposed MTR to retain
- Military Operations Areas
- Restricted Airspace

N

0 25 Miles

Coordinate System: NAD 83 UTM Zone 13N

Attachment 5 – Consulting Parties Invited

Altus AFB EA
Consulting Parties List

National Park Service
Kate Hammond, Director
National Park Service Regions 6, 7, and 8
12795 West Alameda Parkway
Denver, CO 80225

Kansas State Historic Preservation Office
Matthew Chappell, State Historic Preservation Officer
Kansas State Historical Society
6425 SW 6th Avenue
Topeka, KS 66615

Colorado State Historic Preservation Office
Dawn DiPrince, State Historic Preservation Officer
History Colorado
1200 Broadway
Denver, CO 80203

Oklahoma State Historic Preservation Office
Lynda Ozan, Deputy State Historic Preservation Officer
Oklahoma Historical Society
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105
405-521-6249

Texas Historical Commission
Mark S. Wolfe
State Historic Preservation Officer
1511 Colorado St.
Austin, TX 78701

New Mexico Historic Preservation Division
Jeff Pappas, PhD
State Historic Preservation Officer
Bataan Memorial Building
407 Galisteo St. Suite 236
Santa Fe, NM 87501

Attachment 5 – Consulting Parties Invited

Tribal Consulting Parties

Apache Tribe of Oklahoma Chairman Bobby Komardley PO Box 1330 Anadarko, Oklahoma 73005	**Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation, Montana** Chairman Flloyd Azure PO Box 1027 Poplar, Montana 59255
Northern Arapaho Tribe Chairman Lloyd Goggles PO Box 396 Fort Washakie, WY 82520	**Northern Cheyenne Tribe** President Serena Wetherelt PO Box 128 Lame Dear, MT 59043
Cheyenne and Arapaho Tribes Governor Reggie Wassana PO Box 38 Concho, OK 73022	**Tao Pueblo** Governor Clyde M. Romero Sr. PO Box 1846 Taos, NM 87571
Cheyenne River Sioux Tribe of the Cheyenne River Reservation, South Dakota Chairman Harold Frazier PO Box 590 Eagle Butte, South Dakota 57625	**Comanche Nation of Oklahoma** Chairman Mark Woommavovah PO Box 908 Lawton, Oklahoma 73502
Eastern Shoshone Tribe of the Wind River Reservation, Wyoming Chairman John St. Clair PO Box 538 Fort Washakie, Wyoming 82514	**Flandreau Santee Sioux Tribe of South Dakota** President Anthony Reider PO Box 283 Flandreau, South Dakota 57028
Jicarilla Apache Nation President Darrell Paiz PO Box 507 Dulce, New Mexico 87528	**Kiowa Tribe** Chairman Matthew Komalty PO Box 369 Carnegie, Oklahoma 73015
Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation President Serena Wetherelt PO Box 128 Lame Deer, Montana 59043	**Oglala Sioux Tribe** President Julian Bear Runner PO Box 2070 Pine Ridge, South Dakota 57770
Pawnee Nation of Oklahoma President Walter Echo-Hawk PO Box 470 Pawnee, Oklahoma 74058	**Rosebud Sioux Tribe of the Rosebud Indian Reservation, South Dakota** President Scott Herman PO Box 430 Rosebud, South Dakota 57570
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, South Dakota Chairman Donovan White PO Box 509 Agency Village, South Dakota 57262	**Southern Ute Indian Tribe** Chairman Melvin Baker PO Box 737 Ignacio, Colorado 81137

Attachment 5 – Consulting Parties Invited

Spirit Lake Tribe, North Dakota Chairperson Peggy Cavanaugh PO Box 369 Fort Trotten, North Dakota 58335	**Standing Rock Sioux Tribe of North and South Dakota** Chairman Mike Faith PO Box D Fort Yates, North Dakota 58538
Ute Indian Tribe of the Uintah & Ouray Reservation Chairman Luke Duncan PO Box 190 Fort Duchesne, Utah 84026	**Ute Mountain Ute Tribe** Chairman Harold Cuthair PO Box 248 Towaoc, Colorado 81334
Yankton Sioux Tribe of South Dakota Chairman Robert Flying Hawk PO Box 1153 Wagner, South Dakota 57380	

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Kansas
Department of Health and Environment

Phone: 785-296-1535
Fax: 785-559-4264
www.kdheks.gov

Janet Stanek, Secretary

Laura Kelly, Governor

March 5, 2024

ATTN: Mr. Heath Sirmons
97 CES/CEIE
401 L Avenue
Altus Air Force Base, OK 73523
jimmy.sirmons@us.af.mil
Delivered via email

Re: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

Mr. Heath Sirmons,

The Kansas Department of Health and Environment was forwarded a notice from the Kansas Office of the Governor regarding the forthcoming environmental assessment will be completed for Reactivation of Miliary Training Route Instrument Route-177 at Altus Air Force Base in Oklahoma.

KDHE's Division of Environment reviewed the notice for potential general or specific issues or areas of concern that could be address in the environmental assessment and has not identified any in its areas of expertise.

Based on the maps provided in the notice, it appears that the potential routes would be an incursion into Stanton and Morton counties, and possibly Hamilton County. KDHE encourages the Air Force to engage with local governments in and near the potential routes if it has not already.

Please contact Kate Gleeson, Deputy Director of Environment, at 785-296-7054 or kate.gleeson@ks.gov, if you have any questions.

Thank you,

Leo G. Henning
Deputy Secretary for Environment

c: Janet Stanek, Secretary, KDHE
Ryan Wright, Office of Governor Laura Kelly
Kate Gleeson, Deputy Director, KDHE

From: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE
To: Nicholas Sutton
Subject: FW: US Forest Service POC for environmental analysis of air training route
Date: Tuesday, March 5, 2024 4:22:26 PM
Attachments: doc09566320240229175609.pdf

FYI/FYA

Heath Sirmons
Environmental Program Manager
401 L Ave, Altus AFB, OK, 73523
DSN: 866-7609 COM: 580-481-7609

From: Glaspell, Brian - FS, CO <Brian.Glaspell@usda.gov>
Sent: Tuesday, March 5, 2024 8:43 AM
To: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE <jimmy.sirmons@us.af.mil>
Subject: [Non-DoD Source] US Forest Service POC for environmental analysis of air training route

Good Morning!

Future correspondence regarding NEPA analyses for the proposed air training route should be directed to US Forest Service Rocky Mountain Region Planner, Trey Schillie: trey.schillie@usda.gov

Thank you!

Brian Glaspell
Director, Strategic Planning

Forest Service
Rocky Mountain Region

p: 303-275-5161
c: 720-376-8484
brian.glaspell@usda.gov

1617 Cole Blvd, Bldg 17
Lakewood, CO 80401

www.fs.usda.gov

Caring for the land and serving people

From: Sawyer, Sarah - FS, CA <sarah.sawyer@usda.gov>
Sent: Monday, March 4, 2024 1:12 PM
To: Glaspell, Brian - FS, CO <Brian.Glaspell@usda.gov>
Subject: FW: Returned Receipt Letter - Received for RF today, FEB 29, 2024

Hi Brian - see attached for a notice of preparation of an EA by the Air Force and FAA for reactivation of a training Air Route, that is currently inactive. Its asking who might be a POC for us for them to notify when the EA is ready for comments, if we prefer a notification go to someone other than (or in addition to) Frank. Any thoughts on that?
I can't quite tell from the maps whether we'll have any need to comment or not, but seems possible.

Thanks!
Sarah
Sarah Sawyer, PhD
Acting Deputy Regional Forester
Forest Service
Rocky Mountain Region
c: 707-980-8651
sarah.sawyer@usda.gov
Lakewood, CO

-----Original Message-----
From: Beltran, Maria - FS, CO <maria.beltran@usda.gov>
Sent: Thursday, February 29, 2024 4:15 PM
To: Sawyer, Sarah - FS, CA <sarah.sawyer@usda.gov>
Cc: Beltran, Maria - FS, CO <maria.beltran@usda.gov>; Ybright, Patricia - FS, CO <patricia.ybright@usda.gov>
Subject: Returned Receipt Letter - Received for RF today, FEB 29, 2024
Importance: High

Sarah --- thinking this letter will go to your Staff area. I scanned the document & will give original to Patty for her files.

Please let me know if you have any questions. Thanks so much, Maria Beltran

From: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE
To: Nicholas Sutton
Subject: FW: Environmental Assessment for Reactivation of Military Training Route
Date: Wednesday, March 6, 2024 11:48:45 AM
Attachments: image001.png

FYI/FYA

Heath Sirmons
Environmental Program Manager
401 L Ave, Altus AFB, OK, 73523
DSN: 866-7609 COM: 580-481-7609

From: Allmond, Adama (FAA) <Adama.Allmond@faa.gov>
Sent: Wednesday, March 6, 2024 10:34 AM
To: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE <jimmy.sirmons@us.af.mil>
Cc: Roberts, Mona E (FAA) <Mona.E.Roberts@faa.gov>; Patel, Rocky (FAA) <Rocky.Patel@faa.gov>
Subject: [Non-DoD Source] Environmental Assessment for Reactivation of Military Training Route

Mr. Heath Sirmons,

I wanted to respond to your memorandum dated February 23, 2024 in regard to Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma. I first want to clarify that the Will Rogers FSDO does not have responsibility for Jackson County Oklahoma, which encompasses Altus Air Force Base, or the panhandle of Oklahoma. That responsibility lies with the Lubbock FSDO; Mona Roberts is the Manager of that FSDO and is attached to this response.

With that in mind, both FSDO offices did want to make sure that your Environmental Assessment (EA) is being processed by the appropriate section in the FAA. We confirmed that the Draft EA is being coordinated with the ATO Central Service Center in Fort Worth. We were not familiar with this kind of notice regarding EA but we have determined that no action is needed from either FSDO in this process. We appreciate the heads up to what you are proposing and the consideration for our opinion in the matter.

Please let me know if you have any questions or concerns about this, again I want to thank you for the notification.

Adama Allmond

Aviation Safety
Supervisory Aviation Safety Inspector – Unit A
Will Rogers FSDO
Office: (405)951-4233
Fax: (405)951-4282

Any comments you may have on services provided are appreciated.
To leave feedback, please visit the following website:
https://www.faa.gov/about/office_org/field_offices/fsdo/okc

Federal Aviation Administration

U.S. Department
of Transportation
Federal Aviation Administration

Southwest Region
10101 Hillwood Parkway
Fort Worth, TX 76177

March 8, 2024

Mr. Heath Sirmons
97 CES/CEIE
401 L Avenue
Altus Air Force Base, OK 73523

Dear Mr. Heath Sirmons,

This is in response to your February 23, 2024, correspondence concerning the reactivation of military training route instrument route 177 at Altus Air Force Base, Oklahoma. You requested information regarding the impacts of the Proposed Action on the natural environment or other environmental aspects of which you are unaware.

As set forth in Title 14 of the Code of Federal Regulations Part 77, Objects that Affect the Navigable Airspace, the prime concern of the Federal Aviation Administration is the effect of certain proposed construction on the safe and efficient use of the navigable airspace.

To accomplish this mission, aeronautical studies are conducted based on information provided by sponsors on FAA Form 7460-1, Notice of Proposed Construction or Alteration. If your organization is planning to sponsor any construction or alterations that may affect navigable airspace, you must file FAA Form 7460-1 electronically via:
https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

For additional information and assistance, please feel free to contact the Obstruction Evaluation Group via email, OEGroup@faa.gov, at 10101 Hillwood Parkway, Fort Worth, Texas, 76177, or (817) 222-5954.

Sincerely,

For Rob Lowe
Regional Administrator,
Southwest Region

CC: Obstruction Evaluation Group, AJV-A520

From: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE
To: Nicholas Sutton
Subject: RE: 97th Air Mobility Wing
Date: Thursday, March 14, 2024 5:23:47 PM

FYI

-----Original Message-----
From: Williams, Audra (FAA) <audra.williams@faa.gov> On Behalf Of Gonsalves, Joseph (FAA)
Sent: Thursday, March 14, 2024 3:18 PM
To: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE <jimmy.sirmons@us.af.mil>
Subject: [Non-DoD Source] 97th Air Mobility Wing

Mr. Sirmons,

This office thanks you reaching out to us. We have received, reviewed this and have no input at this time.

Have a good day.

Joe Gonsalves
Aviation Safety
Manager, Wichita Flight Standards District Office
Phone: 316-941-1201

Hinono'einino'

Northern Arapaho Tribe

TRIBAL HISTORIC PRESERVATION OFFICE

P.O. Box 67 - St. Stephens, Wyoming 82524

PH: 307.856.1628 FX: 307.856.1974

Date: 3/15/24

Contact Name: Heath Sirmons **Contact Phone:** 580-481-7647
Email Address jimmy.sirmons@us.af.mil
Company Name: Department of the Airforce
Company Address: 401 L Avenue
City: Altus Airforce B **State:** OK **Zip Code:** 73523

RE: ***Environmental Assessment for Reactivation of Military Training Route Instrument***

Dear Sir or Madam:

After reviewing your request under the Section 106 process of the NHPA, and NEPA, our office would like to comment on the proposed project. The Northern Arapaho Tribal Historic Preservation Office makes the following determination:

The Northern Arapaho is interested in participation/consultation

Site Visit: Yes Tribal Monitor: Yes

Our office has come to this determination by drawing conclusions from the survey and file search from maps depicting the provenience of sites regarding the Direct and Visual APE.

Within the Area of Potential Effect, there are:
Cultural Resources: ONE OR MORE
Eligible Historic Properties: ONE OR MORE
Probability of properties of religious and cultural significance to the Northern Arapaho: HIGH

If traditional cultural properties, rock features, or human remains are found during excavation with any new ground disturbance, we request to be contacted and a report provided.

Thank you for consulting with the Northern Arapaho THPO.

Sincerely,
Crystal C'Bearing
THPO Director
crystal.cbearing@northernarapaho.com

From: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE
To: Nicholas Sutton
Subject: FW: Environmental Impact Review
Date: Tuesday, March 19, 2024 1:47:24 PM
Attachments: image002.png

FYI/FYA

From: DEQ EnvReviews <EnvReviews@deq.ok.gov>
Sent: Tuesday, March 19, 2024 8:51 AM
To: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE <jimmy.sirmons@us.af.mil>
Subject: [Non-DoD Source] Environmental Impact Review

Dear Mr. Sirmons:

In response to your request on behalf of Altus AFB, we have completed a general environmental impact review for the project listed below.

Project
Letter dated February 23, 2024 – Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus AFB, OK | Cimarron County

Note: Maps provided with this request show that the IR-177 airspace is over portions of Colorado, Kansas, New Mexico, Oklahoma, and Texas. This review covers only that portion of IR-177 crossing Cimarron County, Oklahoma.

Adverse Environmental Impacts Under DEQ Jurisdiction
None anticipated for any of the alternatives.

Please submit future requests via either our online contact portal or email by attaching a single pdf file containing your request and any attachments.

Thank you for the opportunity to provide our comments. If you have any questions or need clarification, please contact me.

Respectfully,

Jon Roberts | Env. Programs Manager III
Office of Continuous Improvement | Department of Environmental Quality
p. 405-702-7111
Oklahoma.gov | deq.ok.gov

COLORADO
Parks and Wildlife
Department of Natural Resources

Southeast Regional Office
4225 Sinton Road
Colorado Springs, CO 80907
P 719.227.5200

March 21, 2024

ATTN: Mr. Heath Sirmons
978 CES/CEIE
Altus Air Force Base, OK 73523

Subject: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

Dear Mr. Sirmons,

Colorado Parks and Wildlife (CPW) received a request for comment from the Department of the Air Force: 97th Air Mobility Wing for the reactivation of Military Training Route (MTR) Instrument Router (IR)-177. The location is in the southeastern corner of Colorado, in the Lamar area. CPW staff is familiar with the location of the project as well as the area surrounding the site. CPW comments will address potential impacts to wildlife and habitat within the identified project area.

CPW has a statutory responsibility to manage all wildlife species in Colorado; as such we encourage protection for Colorado's wildlife species and habitats through responsible energy development and land use planning. Protection of core wildlife areas, quality fisheries and habitat, big game winter range and seasonal migration corridors, and raptor nesting locations are of extreme importance. CPW recommends that all proposed projects be assessed to avoid, minimize, or mitigate impacts to sensitive wildlife habitats and species. That includes species of concern as well as Federal and/or State listed species, big game wildlife (migration corridors, winter range, and parturition areas), breeding and nesting habitats for sensitive ground-nesting birds, and nests of raptors sensitive to development in order to prevent loss of habitat or fragmentation of habitat. US Fish and Wildlife Service should be consulted on any Federally-listed Endangered and Threatened Species that might be present at the location.

Lesser Prairie Chicken:

All three alternatives in the proposed action overlap with habitat for lesser prairie chickens. The Northern Distinct Population Segment of lesser prairie-chicken, which includes Colorado, is a federally threatened species and protected under the Endangered Species Act. Furthermore, the lesser prairie-chicken is listed as a state endangered species and is a Tier 1 Species of Greatest Conservation Need in the Colorado State Wildlife Action Plan. With the federal threatened status under the Endangered Species Act, the US Fish and Wildlife Service

should be consulted to assess potential impacts to the species within the proposed flight paths.

CPW recommends assessment of impacts regarding potential disturbance impacts to lesser prairie chicken leks resulting from low level flights as well as assessment of potential impacts during the brood raising period, in total the time period of March 1st to July 15th. Assessment of potential impacts on lekking in particular should be included in the EA and CPW requests that potential seasonal minimization measures that raise the minimum flight height, or avoid the portions of the route that overlap important habitat, during critical time periods for the species be evaluated or considered in the assessment of impacts.

Raptors:

There is suitable habitat for foraging and nesting raptors that overlap with all three alternatives. CPW recommends assessment of impacts regarding potential disturbance impacts to nesting birds and strike risks with low level flights be included in the EA. CPW requests that potential seasonal minimization measures that raise the minimum flight height or avoid portions of the route that overlap with known nest locations during the nesting time periods for the species be evaluated or considered in the assessment of impacts. A list of recommended timing stipulations for various raptor species are identified in the CPW document "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" available on the CPW website.

CPW appreciates this opportunity to review the proposed Reactivation of Military Training Route Instrument Route-177 Project. If you have questions or would like clarification about any of our comments please do not hesitate to contact Southeast Regional Land Use Coordinator, Cassidy English, at 719 227-5224 or cassidy.english@state.co.us.

Sincerely,

Todd Marriot
Area Wildlife Manager
Area 12- Lamar

cc: Zachary Pichard, District Wildlife Manager
Cassidy English, SE Land Use Coordinator

Operations Office
512 SE 25th Ave.
Pratt, KS 67124-8174

Kansas
Department of
Wildlife and Parks

Phone: (620) 672-5911
Fax: (620) 672-2972
www.ksoutdoors.com

Chris Kennedy, Secretary

Laura Kelly, Governor

22 March 2024

Mr. Heath Sirmons
97 CES/CEIE
401 L Avenue
Altus Air Force Base, OK 73523

RE: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

Mr. Sirmons,

Thank you for the opportunity to provide input concerning the proposed Environmental Assessment of Reactivation of Military Training Route Instrument Route-177 (IR-177) for personnel and aircraft stationed at Altus Force Base in Oklahoma. The Kansas Department of Wildlife and Parks (KDWP) is responsible for the management and conservation of state-trust wildlife resources, and their habitats, in the State of Kansas. Our review of the proposed Military Training Route IR-177 indicates portions of the route may occur in airspace above Morton, Stanton, and Hamilton counties in the southwestern part of Kansas.

Based on the information submitted to us, it appears the proposed route alternatives will not adversely impact management or public use of any property owned or managed by KDWP for wildlife conservation or outdoor public recreation. We also conclude the reactivation will have limited likelihood of direct or indirect adverse impacts to any Kansas-listed wildlife species with designated critical habitat in Morton, Stanton, and Hamilton counties.

KDWP notes the proposed IR-177 alternatives will occur in airspace over the Cimarron National Grassland and within the estimated occupied range of the federally-listed Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*). Areas of habitat that have been defined as Focal Areas or Connectivity Zones for Lesser Prairie-Chicken conservation by the Western Association of Wildlife and Fisheries Agencies (WAFWA) are also along the proposed IR-177 route alternatives. Breeding and nesting activity of the species may be likely within these Focal Areas and Connectivity Zones. As such, we encourage consultation with the U.S. Forest Service and U.S. Fish and Wildlife Service to minimize potential impacts to the Cimarron National Grasslands and Lesser Prairie-Chicken where their habitat exists along the proposed IR-177 corridor.

KDWP is committed to providing recommendations that will allow for wildlife conservation and management while promoting military readiness. If we can be of any assistance during your ongoing Environmental Assessment, please do not hesitate to reach out to our staff.

Sincerely,

Chris Kennedy
Secretary
Kansas Department of Wildlife and Parks
512 SE 25th Ave.
Pratt, KS 67124

From: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE
To: Nicholas Sutton
Subject: FW: NM HPD Log #121983 EA for Reactivation of Route-177 at Altus Air Force Base
Date: Monday, April 1, 2024 8:41:36 AM

FYA

From: Wands, Cortney, DCA <Cortney.Wands@dca.nm.gov>
Sent: Friday, March 29, 2024 12:05 PM
To: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE <jimmy.sirmons@us.af.mil>
Subject: [Non-DoD Source] NM HPD Log #121983 EA for Reactivation of Route-177 at Altus Air Force Base

HPD Log #121983
Via Email Only

RE: Environmental Assessment for Reactivation of Military Training Route Instrument Route-177 at Altus Air Force Base, Oklahoma

Dear Mr. Sirmons,

The New Mexico State Historic Preservation Division (HPD) received, via mail, a request from the United States Air Force, 97th Air Mobility Wing (AETC) for parties interested in consulting on the NEPA and NHPA Section 106 process for the Reactivation of Military Training Route Instrument Route-177. HPD would like to be participate as a consulting party for the aforementioned consultation.

If you have any questions or concerns, please contact me.

Best regards,

Cortney A. Wands
Archaeological Review
Historic Preservation Division
407 Galisteo Street, Suite 236
Santa Fe, New Mexico 87501
(505) 476-1341

From: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE
To: Nicholas Sutton
Subject: FW: [Non-DoD Source] EA Military Training Route Instrument Route-177
Date: Thursday, April 11, 2024 2:21:06 PM

FYA below.

HS

From: noreply@thc.state.tx.us <noreply@thc.state.tx.us>
Sent: Thursday, April 11, 2024 11:04 AM
To: SIRMONS, JIMMY H CIV USAF AETC 97 CES/CEIE <jimmy.sirmons@us.af.mil>; reviews@thc.state.tx.us
Subject: [Non-DoD Source] EA Military Training Route Instrument Route-177

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202407495
Date: 04/11/2024
EA Military Training Route Instrument Route-177
Altus Air Force Base

Description: Environmental Assessment for reactivation of Military Training Route Instrument Route 177 at Altus Air Force Base Oklahoma, route covers some of Northwestern Texas.

Dear Jeffrey Marshall (Heath Sirmons):
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Justin Kockritz and Drew Sitters, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

We have the following comments: Thank you for the invitation to participate in the Section 106 consultation process for this proposed Military Training Route. We are aware of no historic properties within the Texas portion of the project's Area of Potential Effect and we recommend that the project as proposed will have no effect on historic properties in Texas. Please let us know if the Texas portion of the proposed project is revised, but at this time, we do not believe that our further participation in the Section 106 consultation and NEPA review is necessary.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: justin.kockritz@thc.texas.gov, drew.sitters@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Bradford Patterson
Chief Deputy State Historic Preservation Officer

Please do not respond to this email.

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APPENDIX B. DRAFT NOISE STUDY TO SUPPORT PROPOSED REACTIVATION OF MILITARY TRAINING ROUTE INSTRUMENT ROUTE-177

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Draft

AIRSPACE IMPACT ANALYSIS

TO SUPPORT PROPOSED REACTIVATION OF MILITARY TRAINING ROUTE INSTRUMENT ROUTE-177

March 2024

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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ACRONYMS AND ABBREVIATIONS

AGL	above ground level
AR	Aerial Refueling Track
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
ATS	Air Traffic Service
DAF	Department of the Air Force
DoD	Department of Defense
EA	Environmental Assessment
FAA	Federal Aviation Administration
FL	Flight Level
GPS	Global Positioning System
IFR	Instrument Flight Rules
IR	Instrument Route
JO	Joint Order
MEA	minimum enroute IFR altitude
MOA	Military Operations Area
MOCA	minimum obstacle clearance altitude
MSL	mean sea level
MTR	Military Training Route
NAS	National Airspace System
NAVAID	navigational aid
NM	nautical mile
RNAV	Area Navigation
ROI	Region of Influence
SM	statute mile
SUA	Special Use Airspace
U.S.	United States
USC	United States Code
VFR	Visual Flight Rules
VOR	VHF Omni-directional Range/
VR	Visual Route

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CHAPTER 1 INTRODUCTION

This airspace impact analysis is in support of an Environmental Assessment (EA) and a proposal to the Federal Aviation Administration (FAA) to reconfigure Military Training Route (MTR) Instrument Route (IR) 177 to support training requirements of the Department of the Air Force (DAF). The current MTR has been inactive for some time and the DAF seeks to reactivate and reconfigure the route to align with current and future training requirements. Certain portions of the previously configured IR-177 would be returned to the National Airspace System (NAS). This analysis provides a detailed assessment of the potential impacts to the surrounding airports and airspace in the vicinity of the reconfigured IR-177.

1.1 NATIONAL AIRSPACE SYSTEM

The NAS is a network of both controlled and uncontrolled airspace, both domestic and oceanic. It includes air navigation facilities, equipment and services, airports and landing areas, aeronautical charts, information and services, rules and regulations, procedures and technical information, and manpower and material (FAA 2023a). Airspace management and use considers how airspace is designated, used, and administered in a manner that best accommodates the individual and common needs of military, commercial, general aviation, and other users of the airspace.

In the United States (U.S.), airspace is managed and controlled by the FAA. The FAA is solely responsible for developing plans and policy for the use of airspace and for managing airspace in such a manner that it ensures the safety of flight and that all users of the National Airspace System can operate in a safe, secure, and efficient manner (49 U.S. Code [U.S.C.] 40103(b)). The FAA considers multiple and sometimes competing demands for airspace in relation to airport operations, Air Traffic Service (ATS) routes, military training airspace, and other special needs to determine how the NAS can best be structured to address all user requirements.

The Department of Defense (DoD) requests airspace from the FAA and schedules and uses airspace in accordance with the processes and procedures detailed in DoD Directive 5030.19, *DoD Responsibilities on Federal Aviation*, and FAA regulations. Procedures governing the use of training areas and airspace operated and controlled by the Air Force are included in Air Force Policy Directive 13-2 Air Traffic, Airfield, Airspace and Range Management and its implementing regulations. The Air Force manages airspace in accordance with processes and procedures detailed in Department of the Air Force Manual (DAFMAN) 13-201, Airspace Management. DAFMAN 13-201 also provides the guidance and procedures used to develop and process MTR actions. The proposed MTR would primarily be used by aircraft from Altus AFB but would be available to all Department of Defense aircraft. Users would follow service specific policy for airspace management and procedures. Other applicable regulations regarding MTR management include specific FAA Orders.

The MTR program is established by the FAA and the DoD for the purpose of conducting low altitude and/or high-speed training. MTRs are established in accordance with criteria in FAA Order 7610.4, Special Operations. FAA Order 7610.14, Non-Sensitive Procedures and Requirements for Special Operations, establishes procedures and requirements for ATC planning and coordination and complements FAA Order 7610.4. The FAA has approval authority over the establishment of IRs. The DoD Flight Information Publication (FLIP) Area Planning for Military Training Routes (AP/1B) is the official source of MTR information for military users (effective 21 March 2024).

FAA Order 1050.1F (issued July 16, 2015), Environmental Impacts: Policies and Procedures, provides FAA policy and procedures to ensure agency compliance with the requirements set forth in the CEQ regulations for implementing the provisions of the NEPA, Department of Transportation Order 5610.1C, Procedures for Considering Environmental Impacts, and other related statutes and directives. FAA Order JO 7400.2P (issued April 20, 2023), Procedures for Handling Airspace Matters, provides procedures for administration of the airspace program (FAA 2023d).

1.2 AIRSPACE CLASSIFICATION

Airspace is a three-dimensional resource defined by latitude, longitude, and altitude. There are six classes of airspace-A, B, C, D, E (controlled), and G (uncontrolled)-that are available to all users (civilian and military) (**Figure 1.2-1**). The airspace classes dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace (**Table 1.2-1**).

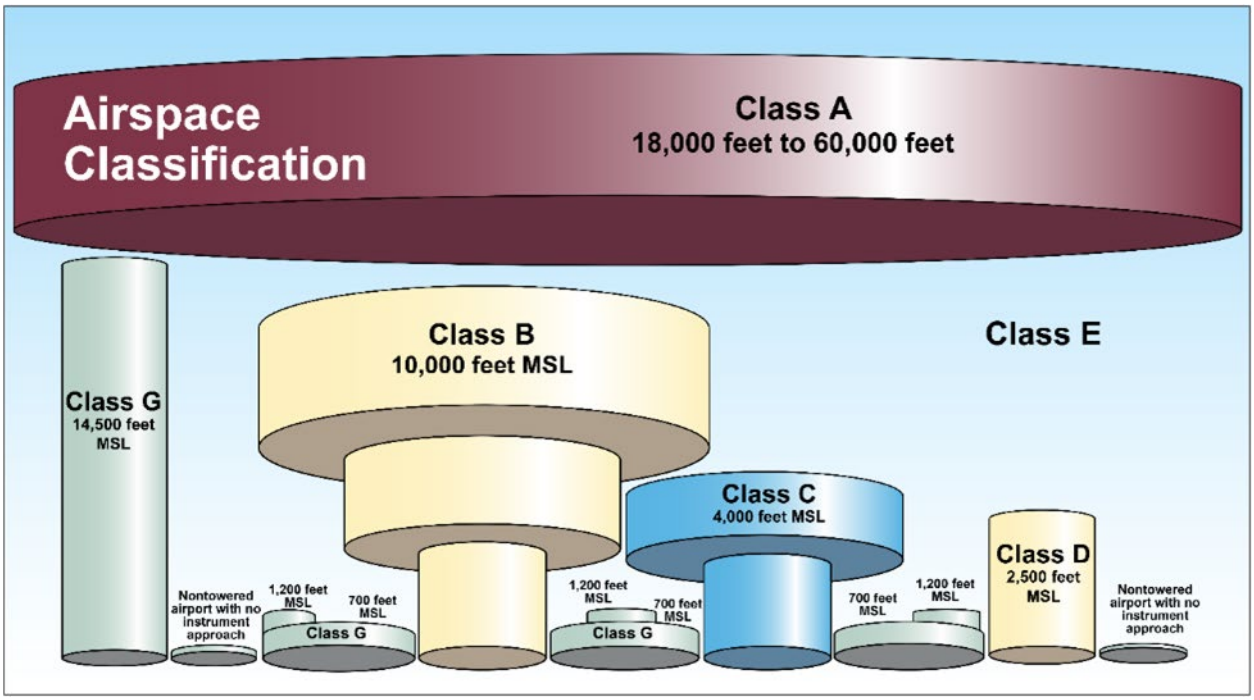

Figure 1.2-1 Airspace Classification

Controlled airspace is airspace of defined dimensions within which Air Traffic Control (ATC) service is provided (FAA 2023b). Controlled airspace is categorized into five separate classes, A through E. Controlled airspace is airspace that supports airport operations and includes airways supporting enroute transit from place-to-place.

Uncontrolled airspace is designated as Class G airspace. Within the continental U.S. and out to 12 nautical miles (NM) offshore, Class G airspace includes all airspace up to 14,500 feet mean sea level (MSL) that has not been designated as Class A, B, C, D, or E. Class G airspace has no specific prohibitions associated with its use. Class G airspace is described as uncontrolled because there are no entry requirements and ATC service is not guaranteed.

Table 1.2-1. Airspace Classification Requirements						
Airspace	**Class A**	**Class B**	**Class C**	**Class D**	**Class E**	**Class G**
General Definition	Controlled airspace from 18,000 feet MSL up to and including FL600	Controlled airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports	Controlled airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower and are serviced by radar approach control	Controlled airspace that extends upward from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower	Controlled airspace designated to serve a variety of terminal or en-route purposes. Class E airspace is often designated for an airport where instrument procedures exist without the presence of a control tower and as extensions to Class B, C, D, and E surface areas.	Uncontrolled airspace that has not been designated as Class A, B, C, D, or E.
Entry Requirements	Air Traffic Control Clearance	Air Traffic Control Clearance	Air Traffic Control Clearance for IFR. Two-way radio communication with Air Traffic Control required	Air Traffic Control Clearance for IFR. All require radio contact	None for VFR. Air Traffic Control Clearance and two-way radio for IFR.	None
Two-Way Radio Communication	Required	Required	Required	Required	Required only under IFR flight plan[1]	Not required[1]

Table 1.2-1. Airspace Classification Requirements

Airspace	Class A	Class B	Class C	Class D	Class E	Class G
VFR Visibility Minimum[2]	NA	3 SM	3 SM	3 SM	Below 10,000 feet MSL: 3 SM At or above 10,000 feet MSL: 5 SM	Below 1,200 feet AGL (regardless of MSL): Day: 1 SM; Night: 3 SM; Above 1,200 feet AGL and less than 10,000 feet MSL: Day: 1 SM; Night: 3 SM At or Above 10,000 MSL:5 SM.
Traffic Advisories	Yes	Yes	Yes	Workload Permitting	Workload Permitting	Workload Permitting

Notes: [1]Unless a temporary tower is present.
[2]Minimum distance from clouds vary by airspace class and altitude.

Legend: AGL = above ground level, FL = Flight Level, IFR = Instrument Flight Rules; MSL = mean sea level; NA = Not Applicable; SM = Statute Mile; VFR = Visual Flight Rules; .

Source: FAA 2023b.

Airspace in the NAS is divided into two categories, regulatory and non-regulatory. The airspace described above and in **Figure 1.2-1** (except Class G airspace) is regulatory. Non-regulatory airspace includes Military Operations Areas (MOAs), Warning Areas, alert areas, controlled firing areas, and national security areas. Within these two categories of airspace, there are four subcategories: controlled, uncontrolled, Special Use Airspace (SUA), and other airspace (FAA 2023b).

Using these airspace classifications, MTRs are located in areas that would otherwise be Class E and G airspace.

1.3 General Flight Rules and Resources

There are specific operational requirements for each class of airspace. Some airspace, such as Class A, requires users to operate under instrument flight rules (IFR), while other airspace allows for visual flight rules (VFR), and in many cases IFR/VFR operate within the same space. The FAA produces charts and publications to guide civil and military flights within the NAS. Aviators can find specific information on airspace and regulatory requirements in VFR/IFR Navigation Charts, Planning Charts, and a variety of supplementary charts and publications (FAA 2023b). These aeronautical charts depict information necessary for flight operations such as ATS routes (victor airways and jet routes), MTRs, aerial refueling tracks, public and private airports, and available aids to navigation.

FAA JO 7110.65A, *Air Traffic Control*, establishes procedures for personnel who provide ATC services within the National Airspace System (FAA 2023c). The primary purpose of the ATC system is to prevent a collision involving aircraft operating in the system. The ATC system is designed to give first priority (duty priority) to separating aircraft and issuing safety alerts, and provide support to national security and homeland defense activities. Behind duty priority is the ATC system's operational priority, which provides service to aircraft on a "first come, first served" basis with the following exceptions (list is not all inclusive): air ambulance flights, presidential aircraft and support elements, active air defense scrambles, and aircraft engaged in navigation aid checks (FAA 2023c).

1.4 MILITARY TRAINING ROUTE PROGRAM GENERAL OPERATING PROCEDURES

An MTR is airspace of defined dimensions established for the conduct of military flight training activities at airspeeds in excess of 250 knots indicated airspeed. These routes are designed to conduct low altitude, high speed training. Routes developed above 1,500 feet AGL are flown to the maximum extent possible under IFR, routes below 1,500 feet AGL are generally developed to be flown under VFR. Operations on VFR MTRs (VRs) are conducted in accordance with VFR except visibility must be 5 miles or more. Operations on IFR MTRs (IRs) are conducted in accordance with IFR regardless of weather conditions. This airspace is defined by designated altitude ceilings and floors and horizontal boundaries described in geographic coordinates. Information on MTRs is contained in FLIP AP/1B.

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CHAPTER 2 ANALYSIS

2.1 REGION OF INFLUENCE

Figures 2.1-2 and 2.1-3 show the reconfigured IR-177 Alternatives analyzed in this assessment. The proposed IR-177 routing would repurpose portions of the existing MTR airspace and standardize the floor elevation. IR-177 currently traverses the Cougar MOA, Two Buttes MOA and the Mt Dora North and East MOAs. Under the Proposed Action, portions of IR-177 would continue to pass through the Cougar MOA and the Two Buttes MOA however, the portion traversing Mt Dora North and East MOAs would no longer exist.

2.1.1 Description of Reconfigured IR-177

The proposed reconfiguration of IR-177 would keep MTR in its current geographic location, approximately 227 miles northwest of Altus AFB. IR-177 would be reconfigured as described in **Table 2-1.1** and depicted in **Figures 2.1-2-2.1.3**. The overview **of the legacy IR-177** is depicted in **Figure 2.1-1**. The legacy IR-177 is routed through the Cougar, Two Buttes, Mt. Dora North and Mt. Dora East MOAs. The proposed IR-177 route would continue to flow through the Cougar and Two Buttes MOAs but would no longer impact the Mt. Dora MOA complex. The hours of operation for IR-177 would be continuous and scheduling would be managed by the 97th Air Mobility Wing at Altus Air Force Base, Oklahoma.

Table 2.1 1. Legacy and Proposed IR 177 Route Under the Proposed Action (Alternatives 1 and 2)

Legacy Point Name	Legacy Altitude Data	Proposed Point Name	Proposed Altitude Data	Lat/Long
Z	5,700 MSL to 19,000 MSL	A	7,000 MSL to 19,000 MSL	N37°06.00' W101°52.00'
-	-	B	7,000 MSL – 15,000 MSL	N37°27.00' W102°00.00'
ZA	5,700 MSL	C	300 AGL to 7,000 MSL	N37°37.00' W102°04.03'
J1	5,700 MSL	D	300 AGL to 7,000 MSL	N38°03.00' W102°14.03'
K	500 AGL to 7,000 MSL	E	300 AGL to 7,000 MSL	N38°46.00' W102°43.50'
L	400 AGL to 7,000 MSL	F	300 AGL to 7,000 MSL	N38°44.00' W103°01.50'
M	200 AGL to 7,000 MSL	G	300 AGL to 7,000 MSL	N38°36.50' W103°03.00'
N	450 AGL to 7,000 MSL	H	300 AGL to 6,000 MSL	N38°24.50' W103°02.00'
O	450 AGL to 6,000 MSL	I	300 AGL to 6,000 MSL	N38°20.00' W103°03.00'
P	200 AGL to 6,000 MSL	J	300 AGL to 6,000 MSL	N38°03.00' W103°21.00'
Q	200 AGL to 6,000 MSL	K	300 AGL to 6,000 MSL	N37°53.00' W103°21.00'
R	200 AGL to 6,000 MSL	L	6,000 MSL to 11,000 MSL	N37°32.00' W102°59.00'
S	6,000 MSL to 11,000 MSL	M	7,000 MSL to 11,000 MSL	N37°20.00' W102°46.00'
SS	7,000 MSL to 11,000 MSL	N	7,000 MSL to 11,000 MSL	N37°15.50' W102°42.00'

Table 2.1 1. Legacy and Proposed IR 177 Route Under the Proposed Action (Alternatives 1 and 2)				
Legacy Point Name	**Legacy Altitude Data**	**Proposed Point Name**	**Proposed Altitude Data**	**Lat/Long**
T	11,000 MSL	O	11,000 MSL	N37°00.00' W102°26.00'
A	17,000 MSL	Not Utilized by Proposed Action	-	N36°35.50' W103°42.50'
B	17,000 MSL	Not Utilized by Proposed Action	-	N36°29.00' W103°30.00'
C	15,000 MSL	Not Utilized by Proposed Action	-	N36°24.00' W103°20.00'
D	5,900 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N36°16.00' W103°04.00'
E	5,900 MSL	Not Utilized by Proposed Action	-	N36°22.00' W102°50.00'
F	200 AGL to 5,900 MSL	Not Utilized by Proposed Action	-	N37°00.00' W102°49.50'
G	200 AGL to 5,900 MSL	Not Utilized by Proposed Action	-	N37°06.50' W102°43.50'
H	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N37°17.50' W102°07.50'
I	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N37°27.00' W102°00.00'
J	200 AGL to 5,700 MSL	Not Utilized by Proposed Action	-	N38°03.00' }W102°14.00'
R1	6,000 MSL	Not Utilized by Proposed Action	-	37°32.00' W102°59.00'
U	6,000 MSL	Not Utilized by Proposed Action	-	N37°40.50' W102°42.50'
V	6,000 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N37°46.50' W102°47.00'
W	7,000 MSL	Not Utilized by Proposed Action	-	N37°52.00' W102°51.00'
X	6,000 MSL to 7,000 MSL	Not Utilized by Proposed Action	-	N38°32.00' W103°21.00'
Y	6,000 MSL	Not Utilized by Proposed Action	-	N38°42.50' W103°16.00'
M1	200 AGL to 6,000 MSL	Not Utilized by Proposed Action	-	N38°36.50' W103°03.00'

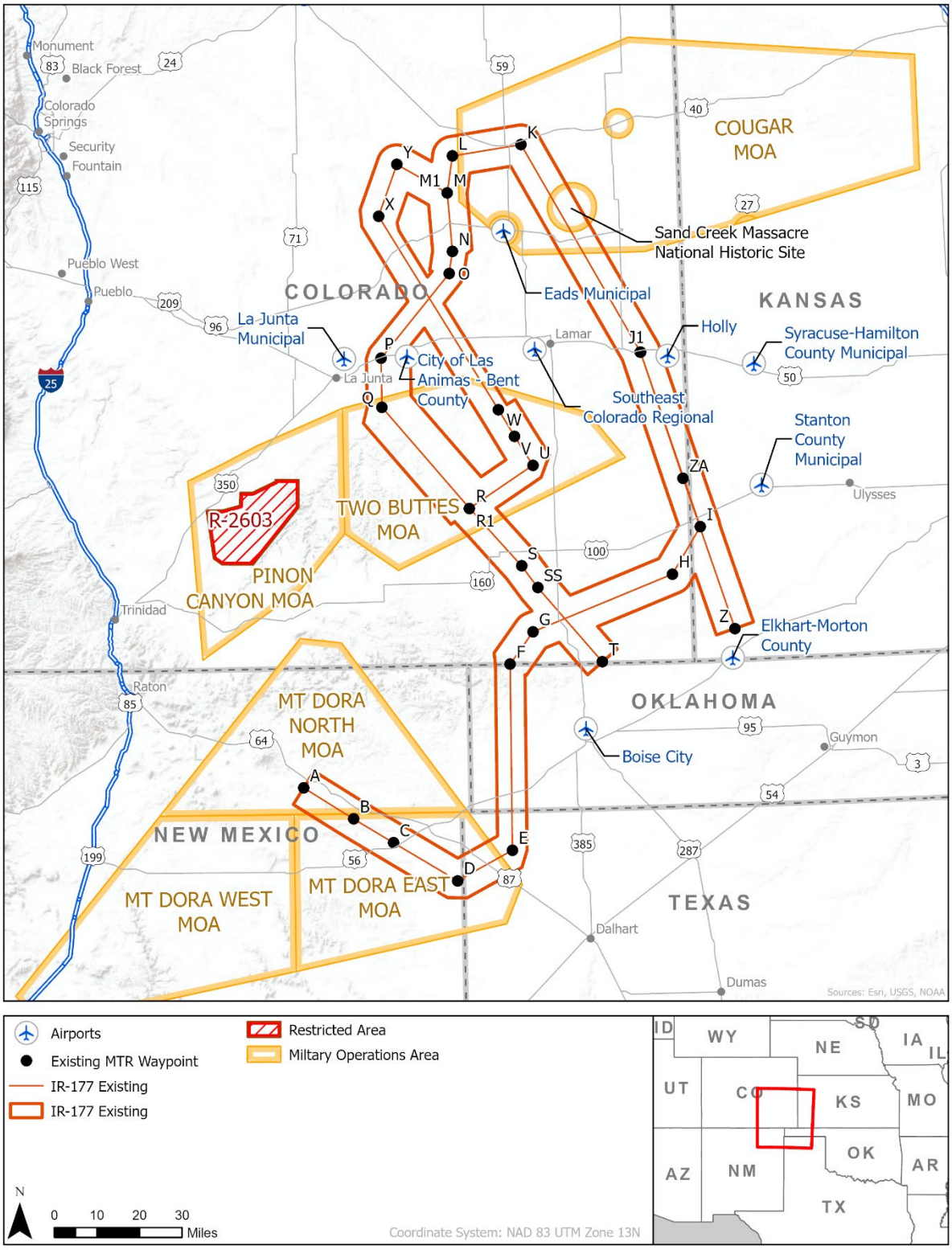

Figure 2.1-1. Overview of Legacy IR-177 and Alternatives

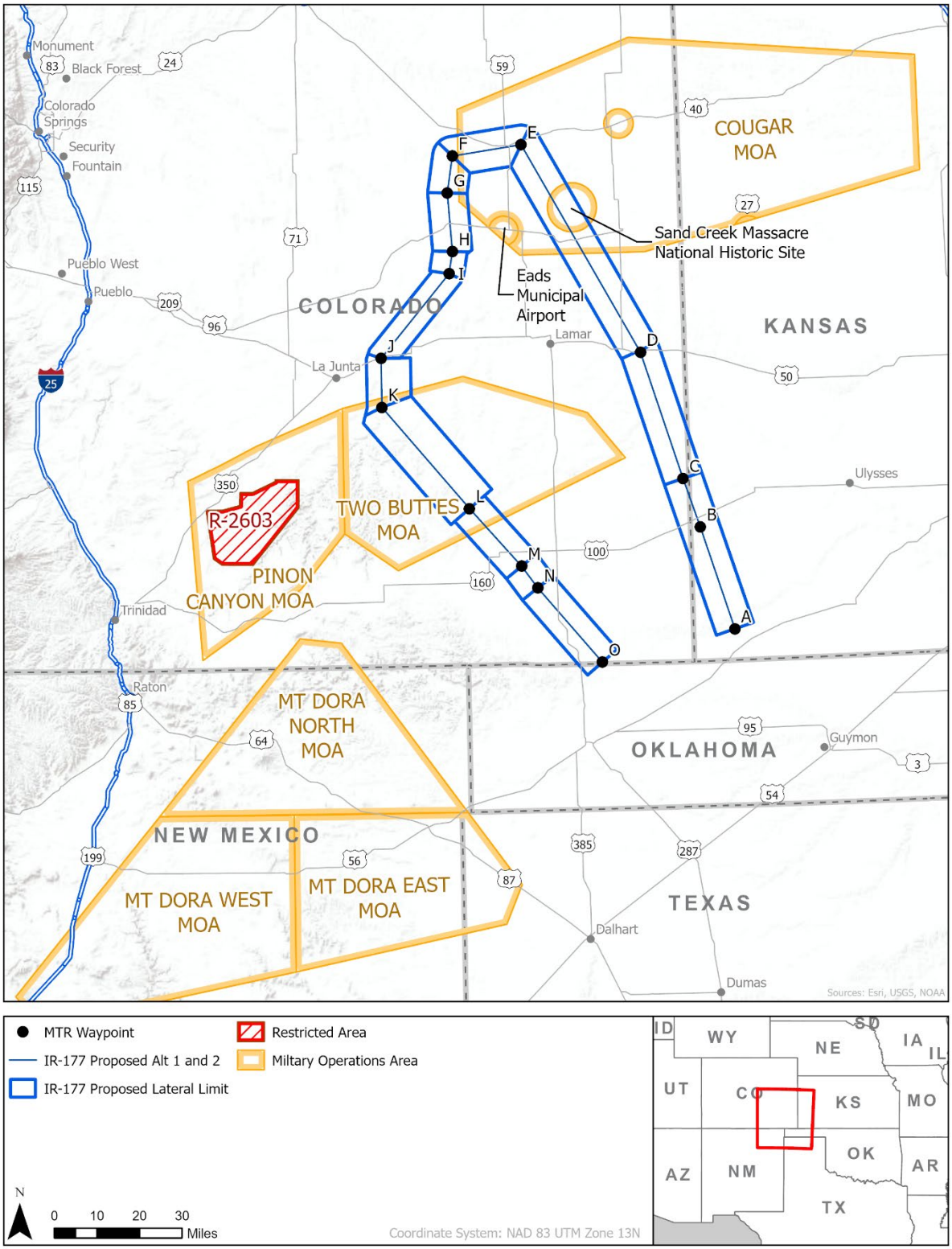

Figure 2.1-2. Overview of Proposed IR-177 Alternatives 1 and 2

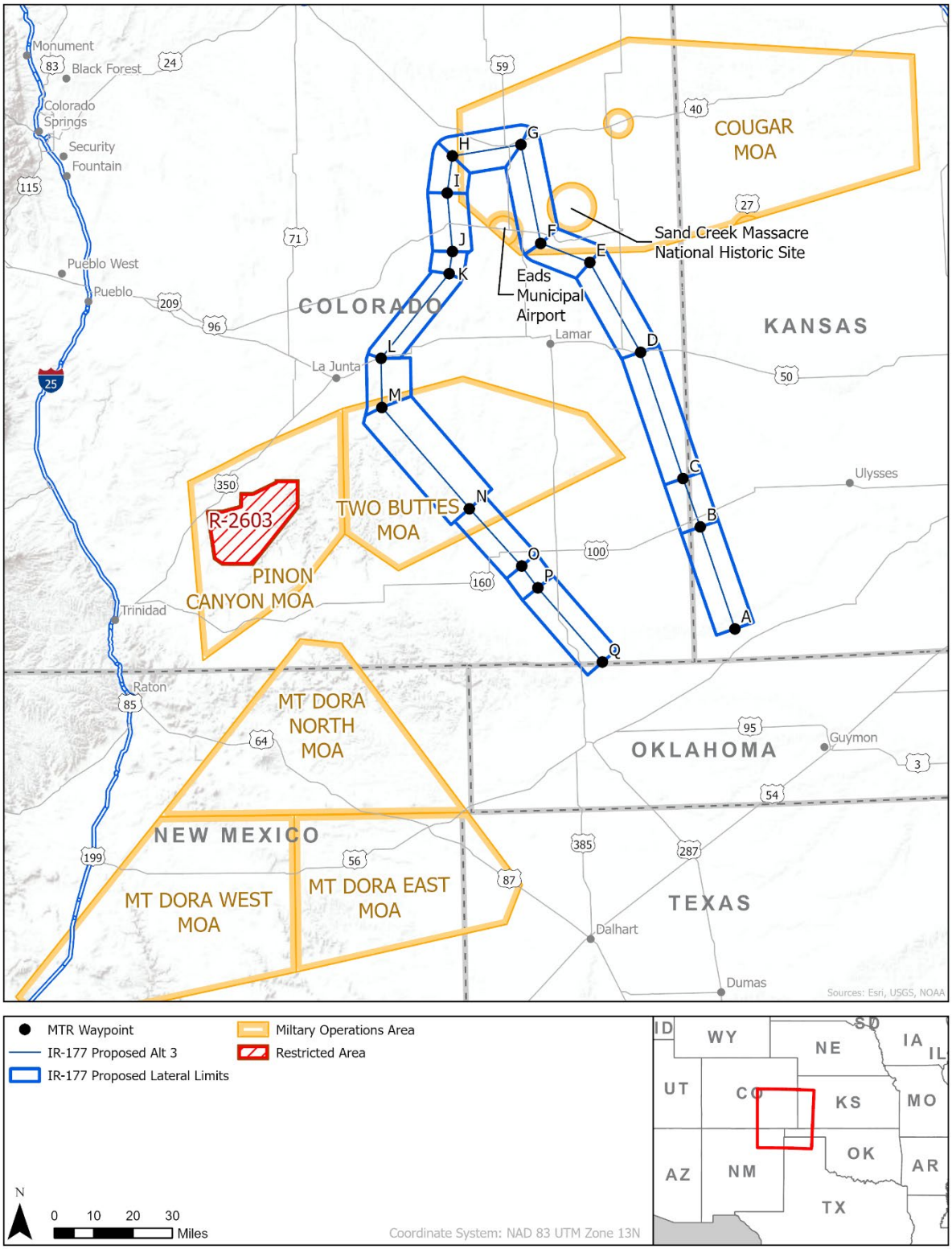

Figure 2.1-3. Overview of Proposed IR-177 Alternative 3

2.1.2 Proposed Usage of IR-177

Table 2.1-2 shows that the reconfigured IR-177 would be used for up to 820 aircraft operations per year. The two main types of training to be conducted in IR-177 are Air Land and Air Drop training by C-17 aircraft. During these activities, aircrew simulate Air Land exercises on a landing strip and cargo drops over a simulated drop zone for Air Drop training. Transient users of the MTR include fighter aircraft such as F-15, F-16, FA-18, and other categories of transport and trainer aircraft such as C-130, KC-46, T-38 and T-6.

Table 2.1 2. Proposed Usage IR 177

Aircraft Type	Operations
C-17	700
F-16C	10
Transient (Fighters)	40
Transient (Other)	70
Total Annual Operations	**820**

Source: Altus AFB, 2022, ANG/DAF, 2023

2.2 POTENTIAL IMPACTS

2.2.1 Obstructions and Airports

An obstruction analysis of the proposed airspace configuration revealed there are 15 vertical obstructions within the lateral boundaries of the reconfigured IR-177. These obstructions are reported as towers 250 feet AGL or higher, **Figure 2.2-1**. There are several charted, standalone windmills and windmill farms east of the reconfigured IR-177 Points L-M. There are two reported windmills which are in close proximity to, but outside of the lateral boundary of the MTR. These obstructions are noted for awareness and excluded from further analysis.

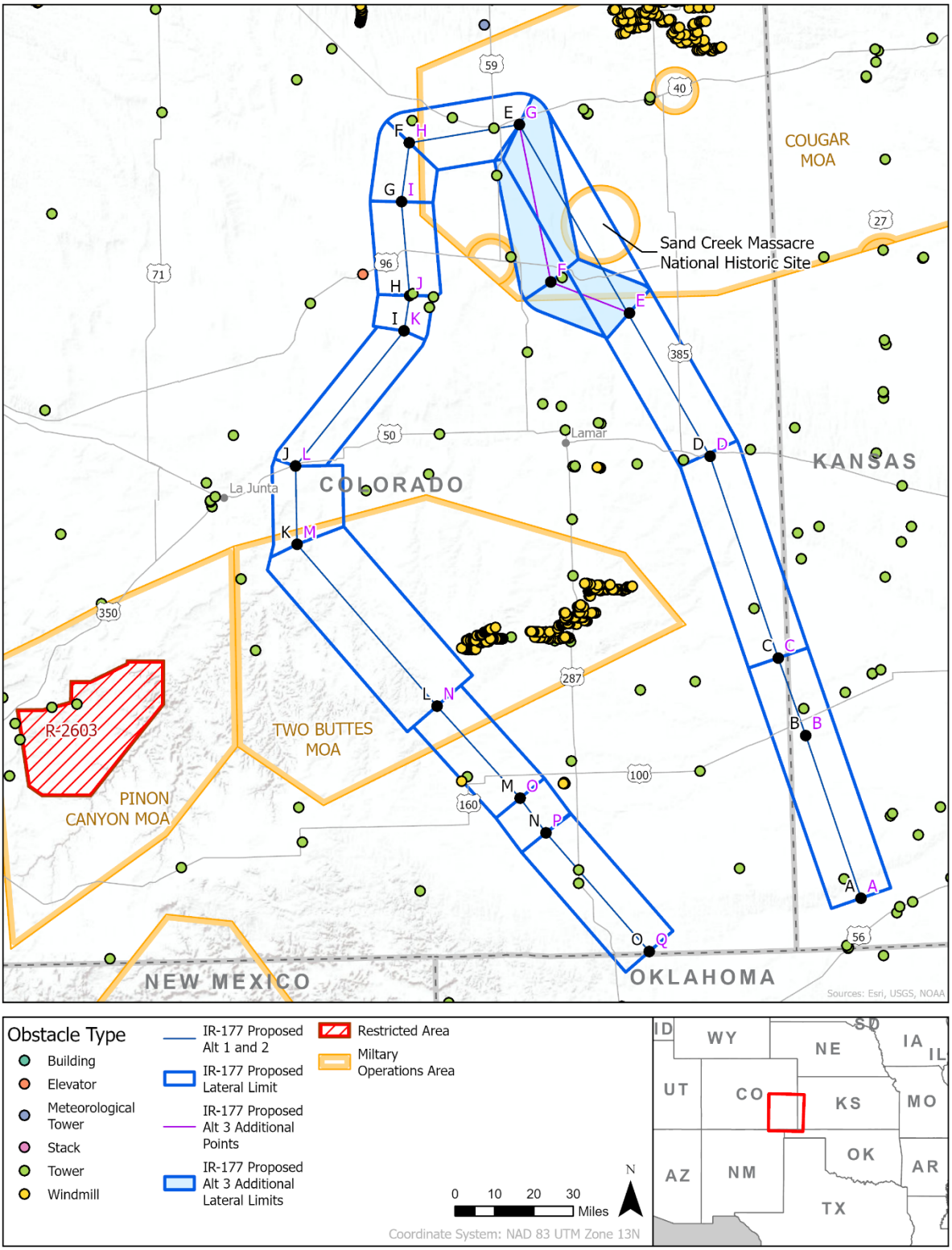

Figure 2.2-1. Vertical Obstructions in IR-177

Table 2.2-1 provides information for each of the public airports in the Region of Influence (ROI) of the proposed IR-177. These public airports and their proximity to the reconfigured IR-177 are depicted in **Figure 2.1-1**. The impacts described in this section are for the Proposed Action (Alternative 1). The airport operations data provided in **Table 2.2-1** was obtained from data reported to the FAA. There are three private airports in the vicinity of the MTR: Tinnes Airport, Scherler Private Airstrip Airport (under Cougar MOA) and Griffin Field Airport. Operations data is not available for the private airports and these are excluded from further analysis.

Table 2.2-1. Public Airports in the IR-177 ROI

Airport Name (Airport Code)	Airport Ownership	Based Aircraft	Annual Operations
Boise City Airport (17K), Boise City, Oklahoma	Public	Single Engine = 9 Multi-engine = 1	GA Local = 2,500 GA Itinerant = 1,000
City of Las Animas - Bent County Airport (K7V9), Las Animas, Colorado	Public	Single Engine = 9	GA Local = 800 GA Itinerant = 85 Military = 10
Elkhart-Morton County Airport (KEHA), Elkhart, Kansas	Public	Single Engine = 8 Multi-engine = 3	GA Local = 3,400 GA Itinerant = 2,600
Eads Municipal Airport (9V7), Eads, Colorado	Public	Single Engine = 9	GA Local = 1,000 GA Itinerant = 250
Holly (K08), Holly, Colorado	Public	Single Engine = 1	GA Local = 740 GA Itinerant = 345
La Junta Municipal Airport (KLHX), La Junta, Colorado	Public	Single Engine = 16 Helicopter = 1	GA Local = 116 GA Itinerant = 8,140 Military = 376
Southeast Colorado Regional Airport (KLAA), Lamar, Colorado	Public	Single Engine = 15 Multi-Engine = 1	GA Local = 1,813 GA Itinerant = 1,613 Military = 200
Springfield Municipal Airport (8V7), Springfield, Colorado	Public	Single Engine = 10	GA Local = 2,650 GA Itinerant = 600
Stanton County Municipal Airport (KJHN), Johnson, Kansas	Public	Single Engine = 34 Multi-Engine = 2 Glider = 1 Helicopter = 1	Air Taxi = 100 GA Local = 14,300 GA Itinerant = 8,700
Syracuse-Hamilton County Municipal Airport (3K3), Syracuse, Kansas	Public	Single Engine = 21	GA Local = 3,600 GA Itinerant = 1,400

Legend: GA = General Aviation ; ROI = Region of Influence;.
Source: SkyVector 2024.

Instrument approach procedures to Elkhart-Morton County Airport (KEHA) may be impacted when the reconfigured IR-177 is active. Elkhart-Morton County Airport serves as a regional hub for helicopter medical evacuation flights. The DAF has agreed to provide an altitude restriction of 7,000 feet MSL north of the airport to allow continued service into KEHA. This is referenced between Point A and Point B in the proposed MTR configuration, the transit altitude in this segment is 7,000 feet MSL to 19,000 feet MSL (flight level 190). The Area Navigation (RNAV) (Global Positioning System [GPS]) Runway 4 missed approach instructions directs aircraft to climb to 6,000 feet MSL and proceed direct the fix SUMTE. The crossing altitudes for fixes and arcs on this procedure are deconflicted from the proposed MTR configuration and are noted for awareness due to the proximity to the MTR. The RNAV (GPS) to Runway 17 approach has holding published over the fix TOPOC between 6,000 feet MSL and 14,000 feet MSL which would be

impacted when IR-177 is active. The RNAV (GPS) Runway 22 has published holding over the fix SUMTE between 5,300 feet MSL and 14,000 feet MSL which may be impacted when IR-177 is active due to the proximity to the lateral boundary of the MTR. The RNAV (GPS) Runway 35 is procedurally deconflicted from the reconfigured IR-177, however, the missed approach instructions require aircraft to climb to 6,000 feet MSL and proceed direct the fix TOPOC. This should be noted for awareness due to the proximity to the MTR boundary. The impact to these approaches is expected to be minimal.

The RNAV (GPS) approaches to both Runway 17 and Runway 35 at Stanton County Municipal Airport (KJHN) may be impacted when IR-177 is active. The full procedure approaches for these runways may interact with the lateral and vertical boundaries of the MTR, in particular the arcing procedure. The same is the case for the RNAV (GPS) approaches to Runway 18 and Runway 36 at Syracuse-Hamilton County Municipal Airport (3K3). When the MTR is active, full procedure approaches may need to be restricted. The impact to these approaches is expected to be minimal.

Instrument approaches to Southeast Colorado Regional Airport (KLAA) may be impacted when IR-177 is active. The Very High Frequency Omni-Directional Range (VOR) Approach to Runway 36 has an initial approach fix LYSES at 6,000 feet MSL which would require aircraft to pass through the MTR when conducting the full procedure approach on the 20 NM arc. The VOR Approach to Runway 18 has a 10-mile arc which comes close to the lateral boundary of IR-177 and should be noted for awareness. The RNAV (GPS) Runway 18 has an initial approach fix WIZGE on the east side which falls right on the boundary of the proposed IR-177. The RNAV (GPS) Runway 8 has an initial approach fix from the north, WOSUR which is in close proximity to the boundary. Aircraft flying ZANON to WOSURE may interact with the training route. The RNAV (GPS) Runway 26 has holding over the initial approach fix ODURE between 6,000 and 14,000 feet MSL which would conflict with the IR-177 lateral and vertical limits. When the MTR is active, full procedure approaches may need to be restricted. The impact to these approaches is expected to be minimal.

The RNAV (GPS) approach to Runway 8 at La Junta Municipal Airport (KLHX) may be impacted when IR-177 is active. The missed approached procedure for this approach directs aircraft to climb to 7,000 feet and hold at the fix TEKAE. The RNAV (GPS) to Runway 26 uses TEKAE as an initial approach fix. Both of these instrument procedures would conflict with the MTR when it is active. When IR-177 is active, these approaches may need to be restricted. The impact to these approaches is expected to be minimal.

2.2.2 ATS Routes / MTRs / Aerial Refueling Tracks / Existing SUA

There are six Air Traffic Service (ATS) routes which traverse the reconfigured IR-177: T-148, V-10, V-210, V-216, V-244, and V-263, **Figure 2.2-1**. All of these low level ATS routes flow and spoke through the LAMAR VOR and the minimum enroute IFR altitude (MEA) for the routes ranges from 5,600 feet MSL to 9,000 feet MSL. **Table 2.2-2** reflects the MEAs and intersecting IR-177 segment altitude. An MEA is the lowest published altitude between two navigation aids which assures the acceptable navigation signal coverage and meets obstacle clearance requirements. There may be impact to navigation via these routes when IR-177 is active. Aircraft utilizing these routes *at* the MEA would require alternate routing or altitudes to deconflict from IR-177. The published MEA is not indicative of the actual altitude aircraft will use on that ATS route. ATS routes may have both an MEA and minimum enroute clearance altitude (MOCA), MOCAs are not included in the analysis. Details on obstacle clearance can be found on the applicable aeronautical chart. The impact to the ATS routes is expected to be minimal as not all routes may be flown at the conflicting MEA.

Table 2.2 2. ATS Routes /IR 177 Intersection

ATS Route	MEA	IR-177 Intersect Points/Altitude
T-148	5,600 feet MSL	Points C-D/300 feet AGL – 7,000 feet MSL
V-10	5,700 feet MSL	Point D/300 feet AGL – 7,000 feet MSL
V-10-244 (west)	7,000 feet MSL	Points I-J/300 feet AGL – 6,000 feet MSL
V-210	7,000 feet MSL	Points J-K/300 feet AGL – 6,000 feet MSL
V-216	6,300 feet MSL	Points D-E/300 feet AGL – 7,000 feet MSL
V-244	9,000 feet MSL	Points D-E/300 feet AGL – 7,000 feet MSL
V-263 (northwest)	6,900 feet MSL	Point H/300 feet AGL – 6,000 feet MSL
V-263 (southwest)	7,400 feet MSL	Points K-L/300 feet AGL – 11,000 feet MSL

Legend: AGL = above ground level; ATS = Air Traffic Service Route; IR = instrument route; MEA = minimum enroute altitude; MSL = mean sea level

Source: SkyVector 2024.

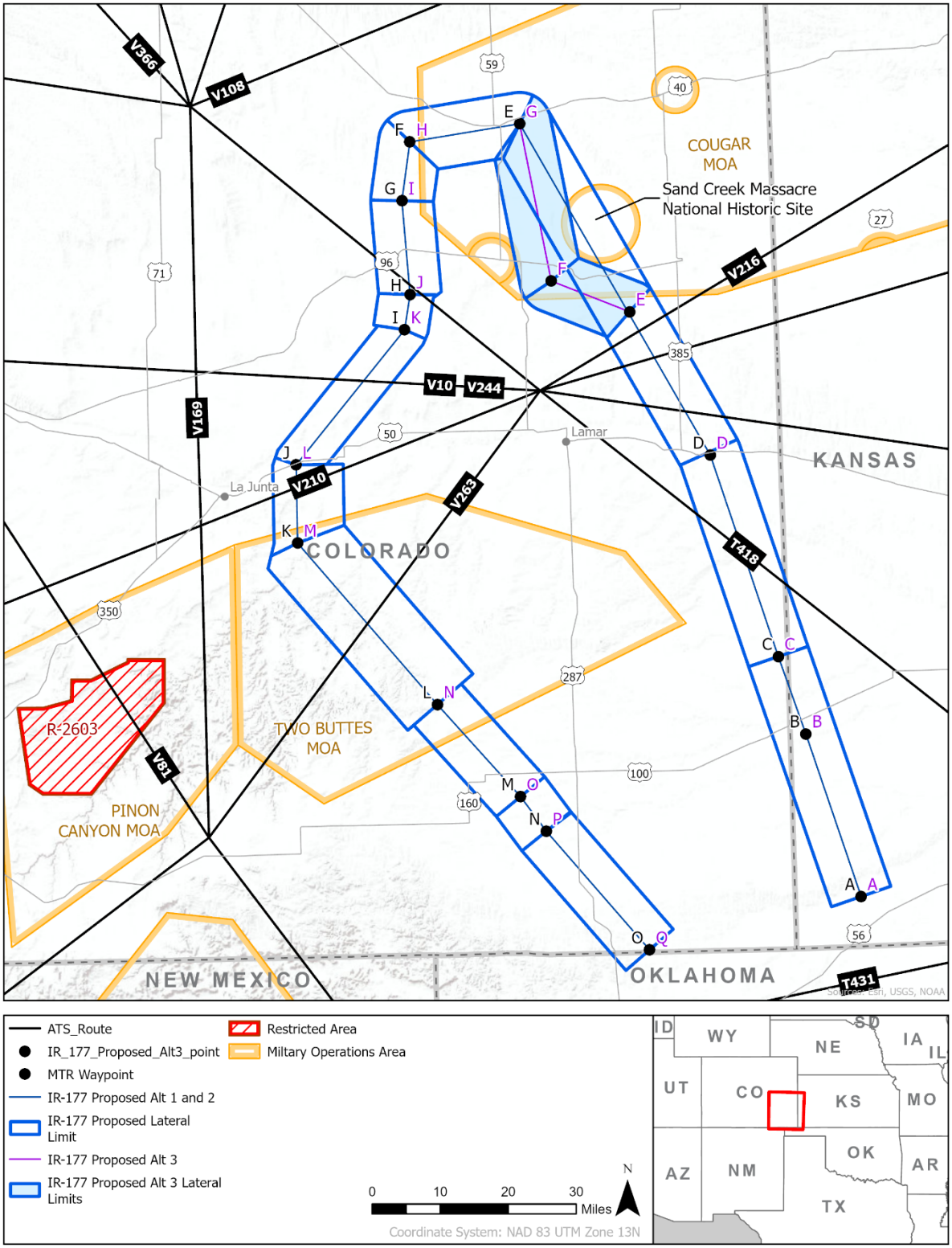

Figure 2.2-1 Enroute Low Chart Overlay Proposed IR-177

There are four IRs which traverse through or intersect the proposed IR-177 boundaries: IR-409, IR-424, IR-500 and IR-501. IR-409 and IR-424 are managed and scheduled by the 140th Wing at Buckley Air National Guard Base (ANGB), Colorado; IR-500 and IR-501 are managed and scheduled by the 27th Operations Support Squadron at Cannon Air Force Base, New Mexico; schedule deconfliction for the IRs would occur between these installations; no impact is expected. There are two aerial refueling tracks (ARs) northeast of the reconfigured IR-177, AR-312 and AR-400.

The reconfigured IR-177 traverses two MOAs, the Cougar MOA and the Two Buttes MOA. Cougar MOA is subdivided into the Cougar Low MOA and Cougar High MOA, **Figure 2.2-1**. The Cougar Low MOA is the airspace from 500 feet AGL up to, but not including, 11,000 feet mean sea level (MSL). The Cougar Low MOA excludes airspace 1,500 feet AGL and below within 3 NM surrounding the Windy Plains, Eads, and Tribune airports. Additionally, the Cougar Low MOA excludes the airspace 5,000 feet AGL and below within 5 nm of the Sand Creek Massacre National Historic Site. The Cougar High MOA is located on top of the Cougar Low MOA within the airspace from 11,000 feet MSL up to, but not including, 18,000 feet MSL. Existing exclusions in the Cougar MOA would remain in place under the proposed reconfiguration of IR-177.

The Two Buttes MOA is subdivided into Two Buttes Low MOA and Two Buttes High MOA. The Two Buttes Low MOA is the airspace from 300 feet AGL up to, but not including, 10,000 feet MSL. The Two Buttes High MOA is located above the Two Buttes Low MOA in the airspace beginning at 10,000 feet MSL up to, but not including, 18,000 feet MSL.

2.3 ALTERNATIVES

2.3.1 Alternatives 1 and 2

Alternative 1 is described in the preceding sections. This Alternative, and Proposed Action would standardize the IR-177 floor elevation at 300 feet MSL, portions of the route would be repurposed and unused portions of the legacy IR-177 would be returned to the NAS. Under Alternative 2, the floor elevation for IR-177 would remain as it currently exists and would not be standardized to 300 feet AGL. The portions of the route reconfiguration would remain the same as Alternative 1 and unused portions of IR-177 would be returned to the NAS. The restrictions agreed upon by the DAF over Elkhart-Morton Country Airport would remain the same. The impacts under Alternative 2 to airports and airspace in the ROI would be the same as Alternative 1.

2.3.2 Alternative 3

Alternative 3 would be similar to Alternative 1 and standardize the floor elevation in IR-177. This Alternative would differ in that it would add points to allow more maneuverability around the Sand Creek Massacre National Historic Site. Restrictions over Eads Municipal Airport would remain as currently published. The impacts under Alternative 2 to airports and airspace in the ROI would be the same as Alternative 1.

2.4 IR-177 SUMMARY

Under the Proposed Action, IR-177 has the potential to affect instrument approach procedures at various airports in the vicinity of the route, The impact is notable when approaches are flown using the full published procedure. There may be impacts to the ATS routes which flow through the LAMAR VOR if aircraft flight at the route's MEA. These flights would require alternate routing or altitude deconfliction when the MTR is active. The Proposed Action would return unused portions of the MTR to the NAS under all Alternatives. There would be no new impacts in the established Cougar MOA and Two Buttes MOA and existing exclusions within those MOAs would remain in place. Impacts to scheduling and management of existing IRs and MOAs would be handled internally among the DAF Agencies and impacts are not anticipated.

CHAPTER 3 REFERENCES

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FAA. 2023b. Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures. Issued April 20, 2023.

FAA. 2023c. Air Traffic Control. Order JO 7110.65AA with Change 1 and 2. Issued April 20, 2023.

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APPENDIX C. AIR QUALITY ANALYSIS

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Air Quality Analysis Methodologies

The following information is provided for additional detail on the methodologies used in the impact analysis.

Analytical Methodology

Aircraft Operations

USAF ACAM was used to model activities associated with the reactivation of IR-177. Solutio provided time in modes (TIMs) for low flight pattern cycles. Aircraft inputs such as engine type and speed are based on information provided by Altus AFB. The resulting data were compiled and input into the ACAM 5.0.23a application to compute criteria pollutant emissions. Emissions were then allocated for each county based on the percentage of time the low flight pattern spent over the respective county.

To analyze GHG emissions associated with diversion of sorties from existing MTRs in use by Altus AFB, the GHG analysis assumes the “worst case” scenario of all sorties being diverted from IR-193 to the proposed reactivated IR-177.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: ALTUS AFB
State: Colorado
County(s): Baca; Cheyenne; Kiowa; Bent; Prowers; Las Animas; Morton; Stanton; Jackson
Regulatory Area(s): NOT IN A REGULATORY AREA; Lamar, CO

b. Action Title: Reactivation of Military Training Route Instrument Route-177

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

Alternative 1 would lower and standardize the floor elevation of IR-177, and the MTR would remain in its current configuration. Alternative 1 would meet the purpose of and need for the Proposed Action, and training missions under Alternative 1 would be beneficial to Altus AFB. The flights would be conducted in their prescribed state by being able to maintain 300 feet AGL contours.
Alternative 2 would differ from Alternative 1 in that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1.
Alternative 3 would be similar to Alternative 1. However, Alternative 3 would modify the legacy route segment between J1 and K to include a slight altering of the route to afford more
maneuverability west of the Sand Creek Massacre National Historic Site while avoiding Eads Municipal Airport by 3 nm.

f. Point of Contact:

Name: Raul Castillo
Title: Air Quality Analyst
Organization: Stantec
Email:
Phone Number:

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

____ applicable
_X_ not applicable

Conformity Analysis Summary:

Alternatives 1 and 2

Location	Total Annual Emissions in Tons					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Colorado Counties						
Baca	0.20	1.24	125.91	4.12	8.88	7.99
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Bent	0.17	1.06	107.77	3.53	7.60	6.84
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Cheyenne	0.12	0.76	77.10	2.52	5.44	4.89
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Kiowa	0.17	1.09	110.66	3.62	7.80	7.02
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Las Animas	0.01	0.06	5.61	0.18	0.40	0.36
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Prowers	0.15	0.94	95.68	3.13	6.74	6.07
Applicable de minimis or PSD Major Source Comparative Threshold	250	250	250	250	100	250
Exceeds threshold?	No	No	No	No	No	No
Kansas Counties						
Morton	0.07	0.42	42.93	1.41	3.03	2.73
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Stanton	0.04	0.25	25.76	0.84	1.82	1.64
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Alternative 3

Location	Total Annual Emissions in Tons					
	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Baca County	0.20	1.24	125.92	4.12	8.88	7.99
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Bent County	0.17	1.06	107.78	3.53	7.60	6.84
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Cheyenne County	0.12	0.73	74.49	2.44	5.25	4.73
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Kiowa County	0.19	1.20	121.63	3.98	8.57	7.72
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Las Animas County	0.01	0.06	5.61	0.18	0.40	0.36
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Prowers County	0.15	0.94	95.43	3.12	6.73	6.06
Applicable de minimis or PSD Major Source Comparative Threshold	250	250	250	250	100	250
Exceeds threshold?	No	No	No	No	No	No
Morton County	0.07	0.42	42.94	1.41	3.03	2.73
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No
Stanton County	0.04	0.25	25.76	0.84	1.82	1.64
PSD Major Source Comparative Threshold	250	250	250	250	250	250
Exceeds threshold?	No	No	No	No	No	No

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Raul Castillo, Air Quality Analyst	Apr 15 2024
Name, Title	**Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions and SC GHG analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: ALTUS AFB
State: Colorado
County(s): Baca; Cheyenne; Kiowa; Bent; Prowers; Las Animas; Morton; Stanton; Jackson
Regulatory Area(s): NOT IN A REGULATORY AREA; Lamar, CO

b. Action Title: Reactivation of Military Training Route Instrument Route-177

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

Alternative 1 would lower and standardize the floor elevation of IR-177, and the MTR would remain in its current configuration. Alternative 1 would meet the purpose of and need for the Proposed Action, and training missions under Alternative 1 would be beneficial to Altus AFB. The flights would be conducted in their prescribed state by being able to maintain 300 feet AGL contours.
Alternative 2 would differ from Alternative 1 in that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1.
Alternative 3 would be similar to Alternative 1. However, Alternative 3 would modify the legacy route segment between J1 and K to include a slight altering of the route to afford more
maneuverability west of the Sand Creek Massacre National Historic Site while avoiding Eads Municipal Airport by 3 nm.

f. Point of Contact:

Name: Raul Castillo
Title: Air Quality Analyst
Organization: Stantec
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2025	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2026 [SS Year]	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2027	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2028	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2029	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2030	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2031	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2032	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2033	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2034	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2035	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2036	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2037	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2038	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2039	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2040	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2041	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2042	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2043	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2044	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2045	88,946	3.74006001	0.72968654	89,257	68,039	Yes
2046	88,946	3.74006001	0.72968654	89,257	68,039	Yes

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	91,213,447	806,517	35,982	92,055,945
2026 [SS Year]	91,213,447	806,517	35,982	92,055,945
2027	91,213,447	806,517	35,982	92,055,945
2028	91,213,447	806,517	35,982	92,055,945
2029	91,213,447	806,517	35,982	92,055,945
2030	91,213,447	806,517	35,982	92,055,945
2031	91,213,447	806,517	35,982	92,055,945
2032	91,213,447	806,517	35,982	92,055,945
2033	91,213,447	806,517	35,982	92,055,945
2034	91,213,447	806,517	35,982	92,055,945
2035	91,213,447	806,517	35,982	92,055,945
2036	91,213,447	806,517	35,982	92,055,945
2037	91,213,447	806,517	35,982	92,055,945
2038	91,213,447	806,517	35,982	92,055,945
2039	91,213,447	806,517	35,982	92,055,945
2040	91,213,447	806,517	35,982	92,055,945
2041	91,213,447	806,517	35,982	92,055,945
2042	91,213,447	806,517	35,982	92,055,945
2043	91,213,447	806,517	35,982	92,055,945
2044	91,213,447	806,517	35,982	92,055,945
2045	91,213,447	806,517	35,982	92,055,945
2046	91,213,447	806,517	35,982	92,055,945

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2026 [SS Year]	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2027	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2028	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2029	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2033	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2034	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2035	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2036	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2037	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2038	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2039	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2040	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2041	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2042	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2043	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2044	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2045	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2046	5,136,454,179	25,626,912	1,500,708	5,163,581,798

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2025-2046	State Total	2,006,695,825	17,743,364	791,600	2,025,230,789
2025-2046	U.S. Total	113,001,991,938	563,792,057	33,015,568	113,598,799,563
2025-2046	Action	1,956,817	82.28132	16.053104	1,963,659
Percent of State Totals		0.09751439%	0.00046373%	0.00202793%	0.09695975%
Percent of U.S. Totals		0.00173167%	0.00001459%	0.00004862%	0.00172859%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00023163%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

Climate Change Assessment (as SC GHG):

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions affect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])			
YEAR			**N2O**
2025	$83.00	$2,200.00	$30,000.00
2026 [SS Year]	$84.00	$2,300.00	$30,000.00
2027	$86.00	$2,300.00	$31,000.00
2028	$87.00	$2,400.00	$32,000.00
2029	$88.00	$2,500.00	$32,000.00
2030	$89.00	$2,500.00	$33,000.00
2031	$91.00	$2,600.00	$33,000.00
2032	$92.00	$2,600.00	$34,000.00
2033	$94.00	$2,700.00	$35,000.00
2034	$95.00	$2,800.00	$35,000.00
2035	$96.00	$2,800.00	$36,000.00
2036	$98.00	$2,900.00	$36,000.00
2037	$99.00	$3,000.00	$37,000.00
2038	$100.00	$3,000.00	$38,000.00
2039	$102.00	$3,100.00	$38,000.00
2040	$103.00	$3,100.00	$39,000.00
2041	$104.00	$3,200.00	$39,000.00
2042	$106.00	$3,300.00	$40,000.00
2043	$107.00	$3,300.00	$41,000.00
2044	$108.00	$3,400.00	$41,000.00
2045	$110.00	$3,500.00	$42,000.00
2046	$111.00	$3,500.00	$43,000.00

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

Action-Related Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$7,382.54	$8.23	$21.89	$7,412.66
2026 [SS Year]	$7,471.48	$8.60	$21.89	$7,501.98
2027	$7,649.38	$8.60	$22.62	$7,680.60
2028	$7,738.32	$8.98	$23.35	$7,770.65
2029	$7,827.27	$9.35	$23.35	$7,859.97
2030	$7,916.21	$9.35	$24.08	$7,949.64
2031	$8,094.11	$9.72	$24.08	$8,127.91
2032	$8,183.05	$9.72	$24.81	$8,217.59
2033	$8,360.95	$10.10	$25.54	$8,396.58
2034	$8,449.89	$10.47	$25.54	$8,485.90
2035	$8,538.84	$10.47	$26.27	$8,575.58
2036	$8,716.73	$10.85	$26.27	$8,753.85
2037	$8,805.68	$11.22	$27.00	$8,843.90
2038	$8,894.62	$11.22	$27.73	$8,933.57
2039	$9,072.52	$11.59	$27.73	$9,111.84
2040	$9,161.46	$11.59	$28.46	$9,201.51
2041	$9,250.41	$11.97	$28.46	$9,290.83
2042	$9,428.30	$12.34	$29.19	$9,469.83
2043	$9,517.25	$12.34	$29.92	$9,559.51
2044	$9,606.19	$12.72	$29.92	$9,648.83
2045	$9,784.09	$13.09	$30.65	$9,827.82
2046	$9,873.03	$13.09	$31.38	$9,917.50

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

State's Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$7,570,716.07	$1,774,336.44	$1,079,453.88	$10,424,506.38
2026 [SS Year]	$7,661,929.51	$1,854,988.09	$1,079,453.88	$10,596,371.48
2027	$7,844,356.41	$1,854,988.09	$1,115,435.67	$10,814,780.17
2028	$7,935,569.85	$1,935,639.75	$1,151,417.47	$11,022,627.07
2029	$8,026,783.30	$2,016,291.41	$1,151,417.47	$11,194,492.18
2030	$8,117,996.75	$2,016,291.41	$1,187,399.26	$11,321,687.42
2031	$8,300,423.64	$2,096,943.06	$1,187,399.26	$11,584,765.97
2032	$8,391,637.09	$2,096,943.06	$1,223,381.06	$11,711,961.21
2033	$8,574,063.98	$2,177,594.72	$1,259,362.86	$12,011,021.56
2034	$8,665,277.43	$2,258,246.37	$1,259,362.86	$12,182,886.66
2035	$8,756,490.87	$2,258,246.37	$1,295,344.65	$12,310,081.90
2036	$8,938,917.77	$2,338,898.03	$1,295,344.65	$12,573,160.45
2037	$9,030,131.21	$2,419,549.69	$1,331,326.45	$12,781,007.35
2038	$9,121,344.66	$2,419,549.69	$1,367,308.24	$12,908,202.59
2039	$9,303,771.55	$2,500,201.34	$1,367,308.24	$13,171,281.14
2040	$9,394,985.00	$2,500,201.34	$1,403,290.04	$13,298,476.38
2041	$9,486,198.45	$2,580,853.00	$1,403,290.04	$13,470,341.49
2042	$9,668,625.34	$2,661,504.66	$1,439,271.84	$13,769,401.83
2043	$9,759,838.79	$2,661,504.66	$1,475,253.63	$13,896,597.07
2044	$9,851,052.23	$2,742,156.31	$1,475,253.63	$14,068,462.18
2045	$10,033,479.13	$2,822,807.97	$1,511,235.43	$14,367,522.52
2046	$10,124,692.57	$2,822,807.97	$1,547,217.22	$14,494,717.76

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

U.S. Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2026 [SS Year]	$431,462,151.04	$58,941,896.86	$45,021,229.08	$535,425,276.98
2027	$441,735,059.39	$58,941,896.86	$46,521,936.72	$547,198,892.97
2028	$446,871,513.57	$61,504,588.03	$48,022,644.35	$556,398,745.96
2029	$452,007,967.75	$64,067,279.20	$48,022,644.35	$564,097,891.30
2030	$457,144,421.93	$64,067,279.20	$49,523,351.99	$570,735,053.12
2031	$467,417,330.29	$66,629,970.37	$49,523,351.99	$583,570,652.65
2032	$472,553,784.47	$66,629,970.37	$51,024,059.62	$590,207,814.46
2033	$482,826,692.83	$69,192,661.54	$52,524,767.26	$604,544,121.62
2034	$487,963,147.01	$71,755,352.70	$52,524,767.26	$612,243,266.97
2035	$493,099,601.18	$71,755,352.70	$54,025,474.90	$618,880,428.78
2036	$503,372,509.54	$74,318,043.87	$54,025,474.90	$631,716,028.31
2037	$508,508,963.72	$76,880,735.04	$55,526,182.53	$640,915,881.29
2038	$513,645,417.90	$76,880,735.04	$57,026,890.17	$647,553,043.11
2039	$523,918,326.26	$79,443,426.21	$57,026,890.17	$660,388,642.63
2040	$529,054,780.44	$79,443,426.21	$58,527,597.80	$667,025,804.45
2041	$534,191,234.62	$82,006,117.38	$58,527,597.80	$674,724,949.80
2042	$544,464,142.97	$84,568,808.54	$60,028,305.44	$689,061,256.96
2043	$549,600,597.15	$84,568,808.54	$61,529,013.08	$695,698,418.77
2044	$554,737,051.33	$87,131,499.71	$61,529,013.08	$703,397,564.12
2045	$565,009,959.69	$89,694,190.88	$63,029,720.71	$717,733,871.28
2046	$570,146,413.87	$89,694,190.88	$64,530,428.35	$724,371,033.10

Relative Comparison of SC GHG:

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

Total SC-GHG ($K [In 2020 $])					
		CO2	**CH4**	**N2O**	**GHG**
2025-2046	State Total	$194,558,281.60	$50,810,543.42	$28,605,527.74	$273,974,352.77
2025-2046	U.S. Total	$10,956,056,763.81	$1,614,495,435.84	$1,193,062,570.62	$13,763,614,770.27
2025-2046	Action	$189,722.32	$235.62	$580.10	$190,538.04
Percent of State Totals		0.09751439%	0.00046373%	0.00202793%	0.06954594%
Percent of U.S. Totals		0.00173167%	0.00001459%	0.00004862%	0.00138436%

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GREENHOUSE GAS (GHG) EMISSIONS

From a global context, the action's total SC GHG percentage of total global SC GHG for the same time period is: 0.00018550%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Raul Castillo, Air Quality Analyst	Apr 12 2024
Name, Title	**Date**

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GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions and SC GHG analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: ALTUS AFB
State: Colorado
County(s): Baca; Bent; Cheyenne; Kiowa; Las Animas; Prowers; Morton; Stanton; Jackson
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Reactivation of Military Training Route Instrument Route-177

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

Alternative 1 would lower and standardize the floor elevation of IR-177, and the MTR would remain in its current configuration. Alternative 1 would meet the purpose of and need for the Proposed Action, and training missions under Alternative 1 would be beneficial to Altus AFB. The flights would be conducted in their prescribed state by being able to maintain 300 feet AGL contours.
Alternative 2 would differ from Alternative 1 in that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 feet AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1.
Alternative 3 would be similar to Alternative 1. However, Alternative 3 would modify the legacy route segment between J1 and K to include a slight altering of the route to afford more
maneuverability west of the Sand Creek Massacre National Historic Site while avoiding Eads Municipal Airport by 3 nm.

f. Point of Contact:

Name: Raul Castillo
Title: Air Quality Analyst
Organization: Stantec
Email:
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

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GREENHOUSE GAS (GHG) EMISSIONS

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2025	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2026 [SS Year]	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2027	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2028	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2029	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2030	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2031	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2032	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2033	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2034	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2035	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2036	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2037	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2038	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2039	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2040	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2041	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2042	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2043	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2044	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2045	89,671	3.77053916	0.73563303	89,985	68,039	Yes
2046	89,671	3.77053916	0.73563303	89,985	68,039	Yes

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

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GREENHOUSE GAS (GHG) EMISSIONS

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	91,213,447	806,517	35,982	92,055,945
2026 [SS Year]	91,213,447	806,517	35,982	92,055,945
2027	91,213,447	806,517	35,982	92,055,945
2028	91,213,447	806,517	35,982	92,055,945
2029	91,213,447	806,517	35,982	92,055,945
2030	91,213,447	806,517	35,982	92,055,945
2031	91,213,447	806,517	35,982	92,055,945
2032	91,213,447	806,517	35,982	92,055,945
2033	91,213,447	806,517	35,982	92,055,945
2034	91,213,447	806,517	35,982	92,055,945
2035	91,213,447	806,517	35,982	92,055,945
2036	91,213,447	806,517	35,982	92,055,945
2037	91,213,447	806,517	35,982	92,055,945
2038	91,213,447	806,517	35,982	92,055,945
2039	91,213,447	806,517	35,982	92,055,945
2040	91,213,447	806,517	35,982	92,055,945
2041	91,213,447	806,517	35,982	92,055,945
2042	91,213,447	806,517	35,982	92,055,945
2043	91,213,447	806,517	35,982	92,055,945
2044	91,213,447	806,517	35,982	92,055,945
2045	91,213,447	806,517	35,982	92,055,945
2046	91,213,447	806,517	35,982	92,055,945

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2026 [SS Year]	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2027	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2028	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2029	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2033	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2034	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2035	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2036	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2037	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2038	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2039	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2040	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2041	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2042	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2043	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2044	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2045	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2046	5,136,454,179	25,626,912	1,500,708	5,163,581,798

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2025-2046	State Total	2,006,695,825	17,743,364	791,600	2,025,230,789
2025-2046	U.S. Total	113,001,991,938	563,792,057	33,015,568	113,598,799,563
2025-2046	Action	1,972,764	82.951862	16.183927	1,979,661
Percent of State Totals		0.09830907%	0.00046751%	0.00204446%	0.09774991%
Percent of U.S. Totals		0.00174578%	0.00001471%	0.00004902%	0.00174268%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00023352%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

Climate Change Assessment (as SC GHG):

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions affect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])			
YEAR			**N2O**
2025	$83.00	$2,200.00	$30,000.00
2026 [SS Year]	$84.00	$2,300.00	$30,000.00
2027	$86.00	$2,300.00	$31,000.00
2028	$87.00	$2,400.00	$32,000.00
2029	$88.00	$2,500.00	$32,000.00
2030	$89.00	$2,500.00	$33,000.00
2031	$91.00	$2,600.00	$33,000.00
2032	$92.00	$2,600.00	$34,000.00
2033	$94.00	$2,700.00	$35,000.00
2034	$95.00	$2,800.00	$35,000.00
2035	$96.00	$2,800.00	$36,000.00
2036	$98.00	$2,900.00	$36,000.00
2037	$99.00	$3,000.00	$37,000.00
2038	$100.00	$3,000.00	$38,000.00
2039	$102.00	$3,100.00	$38,000.00
2040	$103.00	$3,100.00	$39,000.00
2041	$104.00	$3,200.00	$39,000.00
2042	$106.00	$3,300.00	$40,000.00
2043	$107.00	$3,300.00	$41,000.00
2044	$108.00	$3,400.00	$41,000.00
2045	$110.00	$3,500.00	$42,000.00
2046	$111.00	$3,500.00	$43,000.00

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

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GREENHOUSE GAS (GHG) EMISSIONS

Action-Related Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$7,442.70	$8.30	$22.07	$7,473.06
2026 [SS Year]	$7,532.37	$8.67	$22.07	$7,563.11
2027	$7,711.71	$8.67	$22.80	$7,743.19
2028	$7,801.38	$9.05	$23.54	$7,833.97
2029	$7,891.06	$9.43	$23.54	$7,924.02
2030	$7,980.73	$9.43	$24.28	$8,014.43
2031	$8,160.07	$9.80	$24.28	$8,194.15
2032	$8,249.74	$9.80	$25.01	$8,284.56
2033	$8,429.08	$10.18	$25.75	$8,465.01
2034	$8,518.75	$10.56	$25.75	$8,555.06
2035	$8,608.42	$10.56	$26.48	$8,645.47
2036	$8,787.77	$10.93	$26.48	$8,825.18
2037	$8,877.44	$11.31	$27.22	$8,915.97
2038	$8,967.11	$11.31	$27.95	$9,006.37
2039	$9,146.45	$11.69	$27.95	$9,186.09
2040	$9,236.12	$11.69	$28.69	$9,276.50
2041	$9,325.79	$12.07	$28.69	$9,366.55
2042	$9,505.14	$12.44	$29.43	$9,547.00
2043	$9,594.81	$12.44	$30.16	$9,637.41
2044	$9,684.48	$12.82	$30.16	$9,727.46
2045	$9,863.82	$13.20	$30.90	$9,907.91
2046	$9,953.49	$13.20	$31.63	$9,998.32

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

State's Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$7,570,716.07	$1,774,336.44	$1,079,453.88	$10,424,506.38
2026 [SS Year]	$7,661,929.51	$1,854,988.09	$1,079,453.88	$10,596,371.48
2027	$7,844,356.41	$1,854,988.09	$1,115,435.67	$10,814,780.17
2028	$7,935,569.85	$1,935,639.75	$1,151,417.47	$11,022,627.07
2029	$8,026,783.30	$2,016,291.41	$1,151,417.47	$11,194,492.18
2030	$8,117,996.75	$2,016,291.41	$1,187,399.26	$11,321,687.42
2031	$8,300,423.64	$2,096,943.06	$1,187,399.26	$11,584,765.97
2032	$8,391,637.09	$2,096,943.06	$1,223,381.06	$11,711,961.21
2033	$8,574,063.98	$2,177,594.72	$1,259,362.86	$12,011,021.56
2034	$8,665,277.43	$2,258,246.37	$1,259,362.86	$12,182,886.66
2035	$8,756,490.87	$2,258,246.37	$1,295,344.65	$12,310,081.90
2036	$8,938,917.77	$2,338,898.03	$1,295,344.65	$12,573,160.45
2037	$9,030,131.21	$2,419,549.69	$1,331,326.45	$12,781,007.35
2038	$9,121,344.66	$2,419,549.69	$1,367,308.24	$12,908,202.59
2039	$9,303,771.55	$2,500,201.34	$1,367,308.24	$13,171,281.14
2040	$9,394,985.00	$2,500,201.34	$1,403,290.04	$13,298,476.38
2041	$9,486,198.45	$2,580,853.00	$1,403,290.04	$13,470,341.49
2042	$9,668,625.34	$2,661,504.66	$1,439,271.84	$13,769,401.83
2043	$9,759,838.79	$2,661,504.66	$1,475,253.63	$13,896,597.07
2044	$9,851,052.23	$2,742,156.31	$1,475,253.63	$14,068,462.18
2045	$10,033,479.13	$2,822,807.97	$1,511,235.43	$14,367,522.52
2046	$10,124,692.57	$2,822,807.97	$1,547,217.22	$14,494,717.76

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GREENHOUSE GAS (GHG) EMISSIONS

U.S. Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2026 [SS Year]	$431,462,151.04	$58,941,896.86	$45,021,229.08	$535,425,276.98
2027	$441,735,059.39	$58,941,896.86	$46,521,936.72	$547,198,892.97
2028	$446,871,513.57	$61,504,588.03	$48,022,644.35	$556,398,745.96
2029	$452,007,967.75	$64,067,279.20	$48,022,644.35	$564,097,891.30
2030	$457,144,421.93	$64,067,279.20	$49,523,351.99	$570,735,053.12
2031	$467,417,330.29	$66,629,970.37	$49,523,351.99	$583,570,652.65
2032	$472,553,784.47	$66,629,970.37	$51,024,059.62	$590,207,814.46
2033	$482,826,692.83	$69,192,661.54	$52,524,767.26	$604,544,121.62
2034	$487,963,147.01	$71,755,352.70	$52,524,767.26	$612,243,266.97
2035	$493,099,601.18	$71,755,352.70	$54,025,474.90	$618,880,428.78
2036	$503,372,509.54	$74,318,043.87	$54,025,474.90	$631,716,028.31
2037	$508,508,963.72	$76,880,735.04	$55,526,182.53	$640,915,881.29
2038	$513,645,417.90	$76,880,735.04	$57,026,890.17	$647,553,043.11
2039	$523,918,326.26	$79,443,426.21	$57,026,890.17	$660,388,642.63
2040	$529,054,780.44	$79,443,426.21	$58,527,597.80	$667,025,804.45
2041	$534,191,234.62	$82,006,117.38	$58,527,597.80	$674,724,949.80
2042	$544,464,142.97	$84,568,808.54	$60,028,305.44	$689,061,256.96
2043	$549,600,597.15	$84,568,808.54	$61,529,013.08	$695,698,418.77
2044	$554,737,051.33	$87,131,499.71	$61,529,013.08	$703,397,564.12
2045	$565,009,959.69	$89,694,190.88	$63,029,720.71	$717,733,871.28
2046	$570,146,413.87	$89,694,190.88	$64,530,428.35	$724,371,033.10

Relative Comparison of SC GHG:

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

Total SC-GHG ($K [In 2020 $])					
		CO2	**CH4**	**N2O**	**GHG**
2025-2046	State Total	$194,558,281.60	$50,810,543.42	$28,605,527.74	$273,974,352.77
2025-2046	U.S. Total	$10,956,056,763.81	$1,614,495,435.84	$1,193,062,570.62	$13,763,614,770.27
2025-2046	Action	$191,268.44	$237.54	$584.83	$192,090.81
Percent of State Totals		0.09830907%	0.00046751%	0.00204446%	0.07011270%
Percent of U.S. Totals		0.00174578%	0.00001471%	0.00004902%	0.00139564%

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From a global context, the action's total SC GHG percentage of total global SC GHG for the same time period is: 0.00018702%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Raul Castillo, Air Quality Analyst	Apr 12 2024
Name, Title	**Date**

APPENDIX D. DRAFT NOISE STUDY TO SUPPORT PROPOSED REACTIVATION OF MILITARY TRAINING ROUTE INSTRUMENT ROUTE-177

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Draft

NOISE STUDY

TO SUPPORT PROPOSED REACTIVATION OF MILITARY TRAINING ROUTE INSTRUMENT ROUTE-177

April 2024

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ACRONYMS AND ABBREVIATIONS

AGL	Above Ground Level
AFB	Air Force Base
AMW	Air Mobility Wing
DAF	Department of the Air Force
dB	Decibel
dBA	A-weighted decibel
DNL	Day-Night Average Sound Level
DNWG	Department of Defense Noise Working Group
DoD	Department of Defense
EA	Environmental Assessment
FAA	Federal Aviation Administration
FICUN	Federal Interagency Committee on Urban Noise
IR	Instrument Route
L_{dnmr}	Onset-Rate Adjusted Day-Night Average Sound Level
L_{max}	Maximum Sound Level
MTR	Military Training Route
NA	Number of Events Above
SEL	Sound Exposure Level
SAA	Special Activity Airspace
US	United States
USEPA	United States Environmental Protection Agency

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D.1 INTRODUCTION

D.1.1 Background

The Department of the Air Force (DAF), Air Education and Training Command is proposing a reconfiguration of the Military Training Route (MTR) Instrument Route (IR)-177 for aircraft training. Specifically, the 97th Air Mobility Wing (AMW) at Altus Air Force Base (AFB), Oklahoma, is requesting the reconfiguration for C-17 aircraft training. IR-177 is an established MTR that was previously managed by Dyess AFB, Texas for B-1 bomber aircraft training but is currently inactive. The Proposed Action also includes standardization of the floor altitude of the route to 300 feet above ground level (AGL) to align with current and future training requirements.

This noise study supports the *Environmental Assessment (EA) for Reactivation of MTR IT-177 at Altus AFB, Oklahoma*. The IR-177 MTR is geographically separated from Altus AFB and is approximately 227 miles northwest of the Base. The IR-177 MTR covers approximately 7,381 square miles and is located in southeastern Colorado, southwestern Kansas, northwestern Oklahoma, northwestern Texas, and northeastern New Mexico (**Figure D-1**).

The Federal Aviation Administration (FAA) is a cooperating agency for the EA. This noise study has been designed to meet the DAF and FAA requirements for assessing noise impacts.

D.1.2 Document Structure

Section D.1 introduces this study; while Section D.2 describes the methodology used in the analysis and the modeling data used. Section D.3 provides the noise exposures for Alternatives 1, 2, and 3. Section D.4 provides the references.

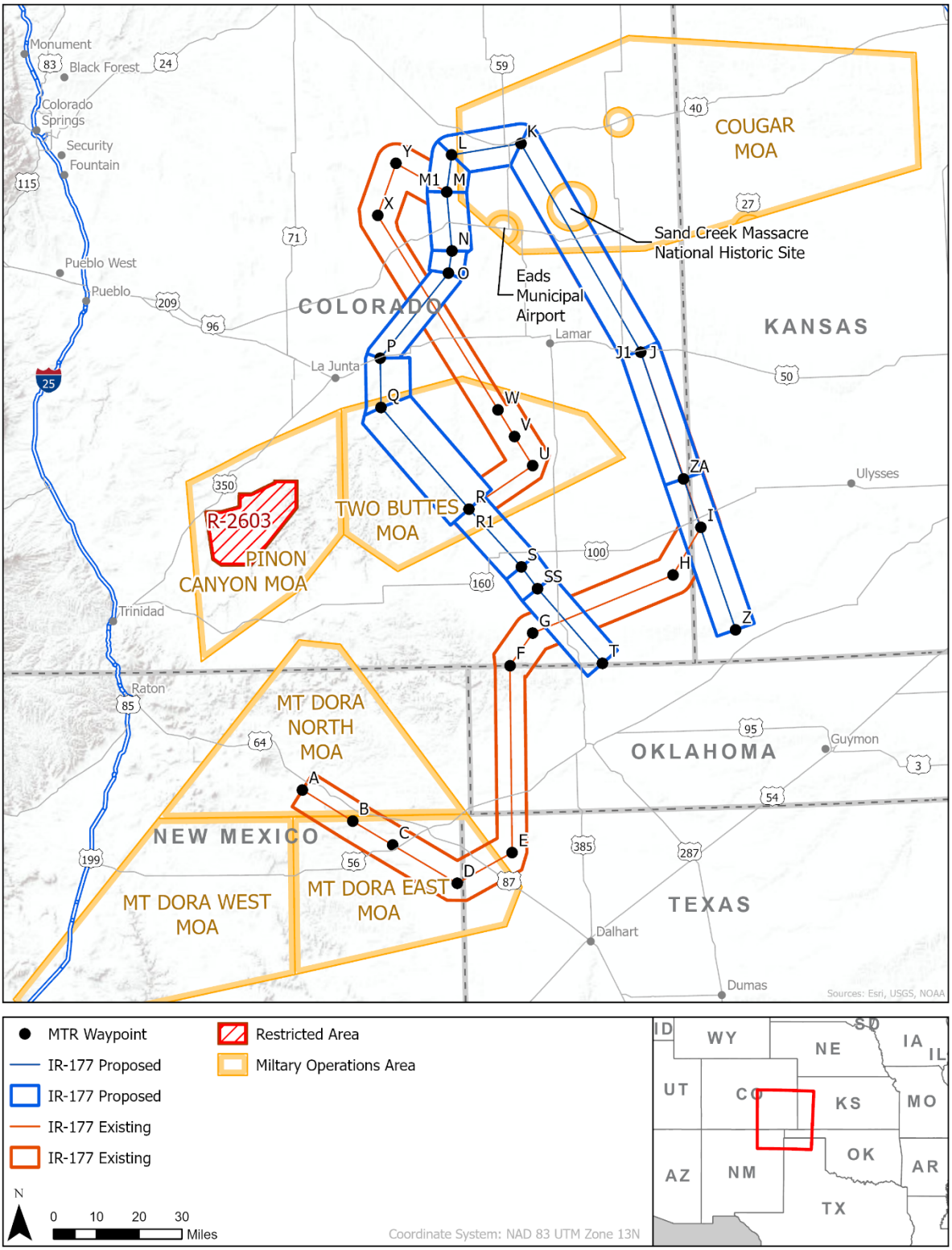

Figure D-1 Legacy and Proposed IR-177 MTR

D.2 METHODOLOGY

The Department of Defense (DoD) and the Federal Interagency Committee on Noise (1992) outline four types of metrics to describe noise exposure for environmental impact assessments:

- A measure of the greatest sound level generated by single aircraft events: Maximum Sound Level (L_{max}),
- A combination of the sound level and duration of a single aircraft event: Sound Exposure Level (SEL),
- A cumulative measure of multiple flights and engine maintenance activity (if applicable for actions in and around airfields): Day-Night Average Sound Level (L_{dn}, also written as DNL), which is the metric used by FAA, and
- A cumulative measure of noise levels in military airspace or MTR: Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}).

Human hearing sensitivity to differing sound pitch, measured in cycles per second or hertz, is not constant. To account for this effect, sound measured for environmental analysis utilizes A-weighting, which emphasizes sound roughly within the range of typical human hearing and de-emphasizes very low and very high frequency sounds that humans do not hear as well. All measurements in decibels (dB) presented in this study utilize A-weighting (dBA) but are presented as dB for brevity unless specified otherwise.

Assessing levels of noise potentially generated by proposed activities requires prediction of future conditions that cannot be measured until those activities are implemented. The solution to this predicament includes the use of computer software to simulate, or model, the future conditions, as detailed in the following sections.

D.2.1 Noise Modeling and Primary Noise Metrics

The DoD prescribes use of the NOISEMAP suite of computer programs (Wyle 1998; Wasmer Consulting 2006) containing the core computational programs called “NMAP,” version 7.3, and “MRNMap,” version 3.0 for environmental analysis of aircraft noise. For this noise study, the NOISEMAP suite of programs refers to BASEOPS as the input module and MRNMap as the noise model used to predict noise exposure in Special Activity Airspace (SAA). NMPLOT is the tool used to combine the noise results produced by NOISEMAP into a combined noise exposure grid, and also assists with visualizations of combined results. As indicated in **Table D-1**, the grid spacing used for calculating noise exposure for the model was 2,000 feet.

Table D-1. Noise Modeling Parameters

Software	Analysis	Version
MR_NMAP	Airspace Noise	3.0
Parameter	**Description**	
Receiver Grid Spacing	2,000 ft in x and y	
Metrics	Primary: L_{dnmr}, DNL Secondary: SEL, NA	
Basis	Busy Month	

Source: Stantec 2024
DNL = Day-Night Average Sound Level; ft = feet; L_{dnmr} = Onset-Rate Adjusted Monthly Day-Night Average Sound Level; NA = number above; SEL = Sound Exposure Level

Day-Night Average Sound Level and Onset-Rate Adjusted Day-Night Average Sound Level (L_{dnmr})
DNL is an A-weighted cumulative noise metric that measures noise based on annual average daily aircraft operations. When DNL is calculated over a busy month of operations (as opposed to an average month) and when a further adjustment is made to penalize for the “surprise factor” caused by fast-moving, low-altitude aircraft, the metric is called $L_{dnmr.}$ This onset-rate adjustment penalizes the noise value by up to 11

dB, depending on the rapidity of the rise in noise. Adjustments are greater for aircraft flying at lower altitudes and higher speeds. Use of the busy month standard is useful to the DoD to characterize the impact that occurs as a result of the cyclic nature of training, where certain military training exercises may be very intense at some times, and non-existent at other times. The DoD uses L_{dnmr} as the standard metric for assessing aircraft noise in training airspace for this reason and also to account for the onset rate, especially for low-altitude tactical aircraft. The FAA standard for assessing aircraft noise is DNL. Because this noise study is in support of an EA that will be considered both by the DAF and the FAA, both metrics were calculated and presented in this study.

DNL has two time periods of interest: daytime and nighttime. Daytime hours are from 7:00 a.m. to 10:00 p.m. local time. Nighttime hours are from 10:00 p.m. to 7:00 a.m. local time. DNL weights operations occurring during the nighttime period by adding 10 dB to their single-event sound level to account for humans being typically more annoyed by noise later at night when most people are resting. Note that "nighttime" in calculation of DNL is sometimes referred to as "environmental night" or "acoustical night" and always corresponds to the times given above. This is often different than the "night" used commonly in military aviation, which is directly related to the times of sunrise and sunset and varies throughout the year with the seasonal changes in day length.

D.2.2 Single-Event Metrics

The DNL metric is the primary descriptor of cumulative noise exposure and anticipated significance of impacts, but this cumulative metric does not provide information on the "loudness" of an aircraft flying in the vicinity of an observer. Thus, the noise analysis includes supplemental data for single events to better describe the "loudness" of individual aircraft overflights for the aircraft proposed to operate in the MTR at various power settings at the lowest possible altitudes (i.e., the floor of the MTR). While the cumulative metric DNL is the United States (US) Government standard metric for assessing noise impacts, single-event metrics can provide more information for the public and decision-makers about the most impactful events in noise sensitive locations. The DoD Noise Working Group (DNWG) provides guidelines to supplement cumulative DNL (DNWG 2009). The single-event noise metrics calculated for this noise study include SEL and Number of Events Above (NA).

The SEL takes all of the sound energy from a single event and compresses it as if the entire event occurred over 1 second. This is useful for comparing single noise events because it accounts for the maximum level of the sound in addition to the duration of the whole event. It is worth noting that SEL is always greater in value than L_{max} because it compresses all sound energy into a 1-second timeframe. For example, as a jet approaches the observer, the sound gets louder and louder, until the jet passes above the observer. At that point, the observer would experience the L_{max} (the maximum sound level), then the sound would diminish as the jet moves past the observer and off into the distance. SEL compresses the sound energy of the entire event, potentially dozens of seconds of noise that occur before and after the loudest level, into a 1-second timeframe, making the value larger than the L_{max} value.

The NA metric gives the total number of events that exceed a noise level threshold during a specified period of time. A threshold level and metric are selected that best meet the need for each situation - this study will use NA 65 SEL. The NA metric is the only supplemental metric that combines single-event noise levels with the number of aircraft operations. In essence, it answers the question of how many aircraft (or range of aircraft) fly over a given location or area at or above a selected threshold noise level.

D.2.3 Aircraft Data

The modeled scenario consists of predominately C-17 low level operations per the Proposed Action of Altus AFB and the required training needs of the 97 AMW. Additionally, F-16 fighters from the nearby 140th Wing at Buckley AFB are also included, as they may use the low route as well. A number of transient aircraft are also to be modeled and will include F-16C as a general fighter, and additional cargo transport type aircraft, modeled as additional C-17 operations.

Table D-2 displays the annual flight operations for IR-177 as provided by the 97 AMB and the 140 Wing.

Table D-2. Proposed Annual MTR Operations

User	Aircraft	Daytime Operations	Nighttime Operations	Total Operations
97 AMB	C-17	566	134	**700**
140th Wing	F-16C	8	2	**10**
Transient	Fighter (F-16C)	36	4	**40**
Transient	Cargo/Heavy (C-17)	64	6	**70**
Total Operations		**674**	**146**	**820**

C-17 flight profiles for the use of IR-177 were developed in conjunction with aircraft representatives from the 97 AMW at Altus AFB. C-17 aircraft typically fly within MTRs at airspeeds of approximately 310 knots but do slow to around 130 knots for certain training maneuvers. **Tables D-3** and **D-4** display the modeled flight profiles for C-17 operations within IR-177.

Table D-3. C-17 Slow Speed MTR Profile

Altitude (ft AGL)	Percent of Time Within Altitude Band
300–500	50%
500–1000	45%
1000–3000	5%
Airspeed	**Power Configuration**
130 knots	1.1 Variable EPR

Table D-4. C-17 High Speed MTR Profile

Altitude (ft AGL)	Percent of Time Within Altitude Band
300–500	50%
500–1000	45%
1000–3000	5%
Airspeed	**Power Configuration**
310 knots	1.3 Variable EPR

Flight profiles for F-16C (F100-PW-220 engine) MTR usage were taken from a recent Environmental Impact Statement at Holloman AFB where MTRs were modeled. **Table D-5** displays the modeled flight profiles for F-16C operations within IR-177.

Table D-5. F-16C MTR Profile

Altitude (ft AGL)	Percent of Time Within Altitude Band
500–1000	90%
1000–2000	7%
2000–3000	3%
Airspeed	**Power Configuration**
500 knots	95.4 Variable %NC

D.2.4 Impact Analysis

The impact analysis of the noise environment involves consideration of many factors including the types, locations, and frequency of aerial operations, the classification of existing airspace, and the amount of air traffic using or transiting through a given area. This study quantifies the anticipated subsonic noise from

military aircraft activity within the existing and proposed SAA using modeling software described in Section 2.1. This action has no supersonic operations. There is no defined significance threshold for noise with regard to National Environmental Policy Act analysis; however, the impact analysis compares the modeled results with DNL guidelines from the US Environmental Protection Agency (USEPA), Federal Interagency Committee on Urban Noise (FICUN), and FAA.

The USEPA has identified 55 DNL as a level that protects public health and welfare with an adequate margin of safety (USEPA 1982). This means that 55 DNL is a threshold below which adverse noise effects are not expected to occur. According to the FICUN, noise exposure greater than 65 DNL is considered generally incompatible with residential, public use (i.e., schools), or recreational and entertainment areas (FICUN 1980).

For airspace actions, FAA requires that an action proponent prepare noise exposure tables to identify where noise will change by the following specified amounts (FAA Order 1050.1F):

- For DNL 65 dB and higher: +/- DNL 1.5 dB
- For DNL 60 dB to <65 dB: +/- DNL 3 dB
- For DNL 45 dB to <60 dB: +/- DNL 5 dB

Noise induced hearing loss risk would be a concern for populations exposed to noise greater than 80 DNL (Undersecretary of Defense for Acquisition Technology and Logistics 2009). Under the SAA addressed in this action, no person or place would be exposed to noise levels greater than 80 DNL. Thus, an assessment of noise induced hearing loss is not warranted for this action.

D.3 NOISE RESULTS

The DoD preferred L_{dnmr} and the FAA preferred DNL were both calculated and found to be identical for all alternatives. The reported DNL/L_{dnmr} levels are the maximum noise level on the ground below the centerline of each MTR segment. Two versions of the noise model were created – one with all C-17 aircraft using the slower profile and one with all C-17 aircraft using the faster profile. To conservatively model the worst possible noise conditions beneath the MTR, the loudest C-17 profile was chosen for all alternatives. The number of operations from F-16C, C-17, and transient aircraft remains the same for all alternatives. Note that any noise results below the value of 35 dB DNL/L_{dnmr} are reported as "<35" as the noise modeling software is less accurate when computing extremely low noise levels.

Alternative 1 would lower and standardize the floor elevation of IR-177 to 300 ft AGL, the MTR would remain in its current configuration, and the segment names would be updated (**Figure D-2)**. Unused portions of the legacy IR-177 MTR would remain inactive under this alternative. **Table D-6** displays the noise results for Alternative 1.

Table D-6. Alternative 1 Noise Results

Segment	DNL/L_{dnmr} (dB)	NA 65 SEL
A–B	52	0.9
B–C	52	0.9
C–D	52	0.9
D–E	50	0.7
E–F	50	0.7
F–G	50	0.7
G–H	52	0.9
H–I	52	0.9
I–J	52	0.9
J–K	49	0.6
K–L	50	0.7
L–M	43	0.6
M–N	40	1.5
N–O	40	1.5

DNL = day-night average sound level; L_{dnmr} = Onset-Rate Adjusted Day-Night Average Sound Level; NA 65 SEL = number of events above 65 decibels sound exposure level

Alternative 2 would differ from Alternative 1 in that the floor elevation of IR-177 would remain in its current configuration and would not be standardized to 300 ft AGL. Alternative 2 would repurpose portions of IR-177 and propose the same end state of IR-177 and renaming configuration as Alternative 1 (**Figure D-3)**. **Table D-7** displays the noise results for Alternative 2.

Table D-7. Alternative 2 Noise Results

Segment	DNL/L_{dnmr} (dB)	NA 65 SEL
A–B	42	1.4
B–C	42	1.4
C–D	50	0.7
D–E	49	0.6
E–F	51	0.5
F–G	49	0.5
G–H	50	0.6
H–I	52	0.6
I–J	52	0.6
J–K	50	0.4
K–L	42	0.8
L–M	40	1.2
M–N	<35	1.0
N–O	<35	1.0

DNL = day-night average sound level; L_{dnmr} = Onset-Rate Adjusted Day-Night Average Sound Level; NA 65 SEL = number of events above 65 decibels sound exposure level

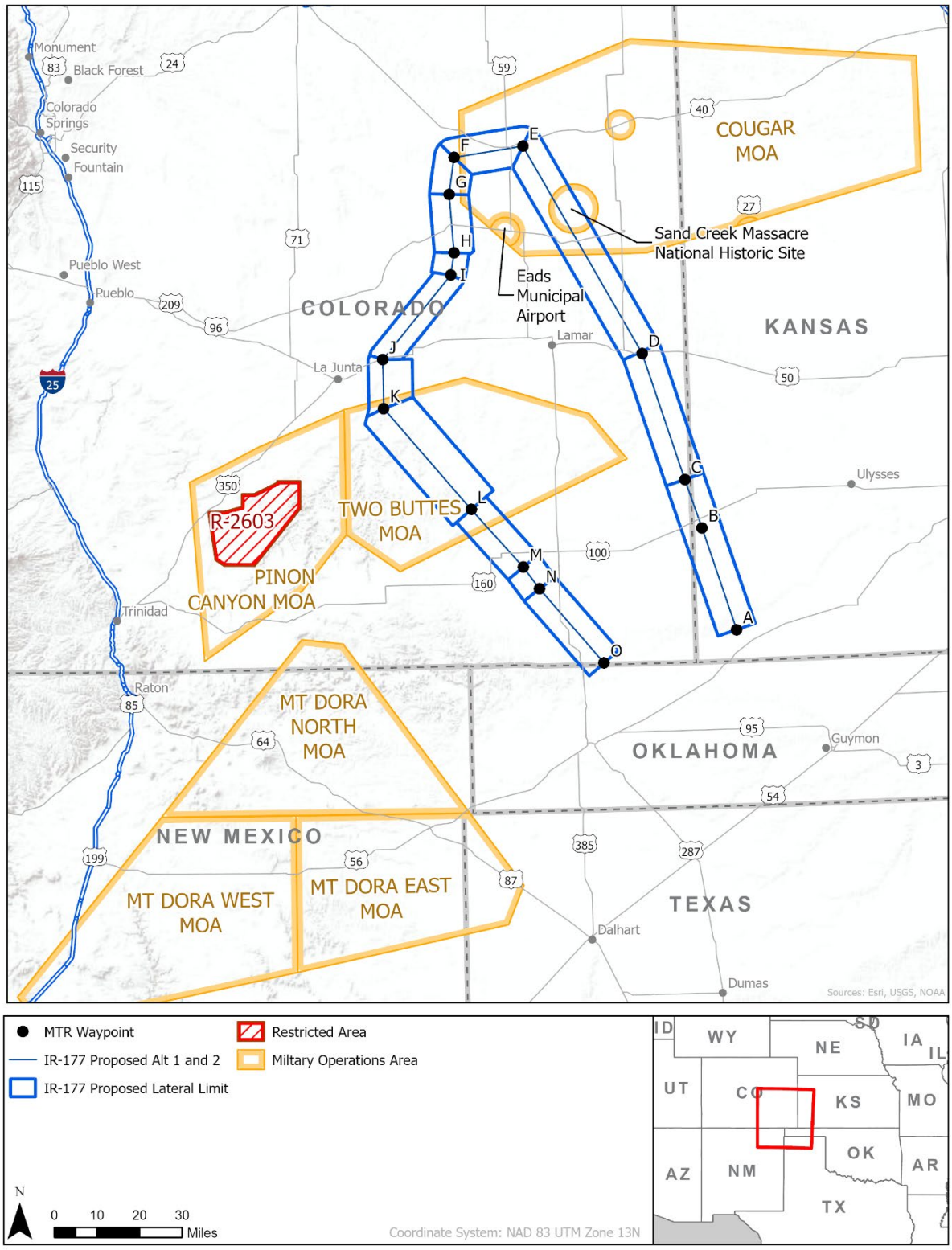

Figure D-2 Alternative 1 and 2 IR-177 MTR

Alternative 3 would be similar to Alternative 1; however, Alternative 3 would modify the legacy route segments to include a slight altering of the route to afford more maneuverability west of the Sand Creek Massacre National Historic Site while avoiding Eads Municipal Airport by 3 nm. This MTR modification would have a proposed lowest altitude of 300 feet AGL and a proposed highest altitude of 7,000 mean sea level. **Table D-8** displays the noise results for Alternative 3.

Table D-8. Alternative 3 Noise Results

Segment	DNL/L_{dnmr} (dB)	NA 65 SEL
A–B	51	0.6
B–C	51	0.6
C–D	51	0.6
D–E	51	0.6
E–F	51	0.6
F–G	50	0.5
G–H	50	0.5
H–I	50	0.5
I–J	50	0.5
J–K	51	0.6
K–L	51	0.6
L–M	51	0.6
M–N	49	0.4
N–O	50	0.5
O–P	43	0.6
P–Q	40	1.2

DNL = day-night average sound level; L_{dnmr} = Onset-Rate Adjusted Day-Night Average Sound Level; NA 65 SEL = number of events above 65 decibels sound exposure level

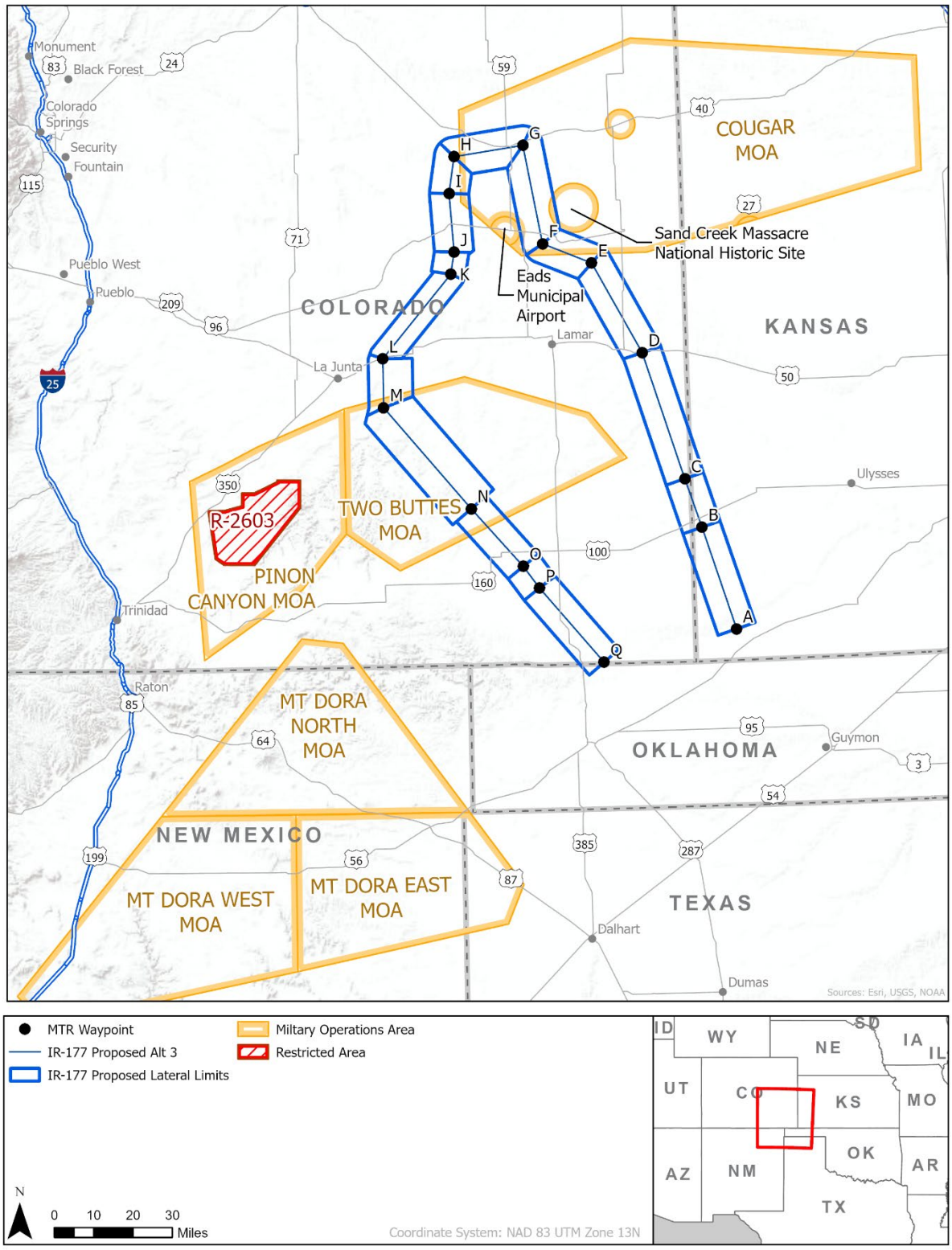

Figure D-3 Alternative 3 IR-177 MTR

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