*Draft*

# Environmental Assessment

Addressing Aircraft Realignment and Beddown Activities

*Cannon Air Force Base, New Mexico*

*Prepared for:*

Department of the Air Force

November

2019

*This page intentionally left blank.*

# Draft Finding of No Significant Impact (FONSI) and Finding of No Practicable Alternative (FONPA)

**FOR AN**

## ENVIRONMENTAL ASSESSMENT ADDRESSING AIRCRAFT REALIGNMENT AND BEDDOWN ACTIVITIES AT CANNON AIR FORCE BASE, NEW MEXICO

### Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to support Air Force Special Operations Command (AFSOC) mission requirements by improving mission efficiency, upgrading aging aircraft, and accommodating sufficient training capabilities.

The Proposed Action is needed because the AFSOC mission at Cannon Air Force Base (AFB) continues to grow and evolve, requiring its flight crews to be provided with sufficient training capabilities and associated infrastructure. Improvements and updates are needed to keep pace as warfare grows ever more technologically advanced and specialized.

### Description of the Proposed Action and Alternatives

***Proposed Action.*** The Environmental Assessment (EA) evaluates the potential environmental effects that may arise from the update and implementation of priority aircraft realignment and beddown actions at the installation for the 27th Special Operations Wing (SOW). Six component actions require updating from the original baseline level of activities to continue the Cannon AFB mission through 2026. These programs include 9th Special Operations Squadron (SOS) expansion of the MC-130J aircraft mission, an increase in 12/3/33rd SOS personnel and training for the MQ-9 Reaper remotely piloted aircraft (RPA), 16th SOS upgrade of AC-130W aircraft, 27th SOS water safety training updates, 551st SOS addition of flight simulators, and 27th Special Operations Maintenance Squadron (SOMXS) munitions storage area upgrades. These programs, which would update similar activities identified in a *2007 Environmental Impact Statement for AFSOC Assets Beddown at Cannon AFB*, include increases in personnel, aircraft, and training levels and facility demolition and construction.

***Alternatives.*** Potential alternatives for component actions were considered and either carried forward for full environmental analysis in the EA or dismissed in accordance with five universal selection standards discussed in Section 2.3 of the EA. As applicable, component actions included additional component action-specific selection standards. Alternatives for all the component actions were analyzed; a number of component actions had alternatives that had just one location that met the selection standards. Other alternatives were considered but dismissed as described in Section 2 of the EA. Alternatives for component actions that met the universal and project-specific selection standards were considered reasonable and carried forward for full environmental impact analysis in the EA.

***No Action Alternative.*** The No Action Alternative is carried forward for further analysis in the EA to provide a baseline against which the effects of the Proposed Action can be assessed. The No Action Alternative would be "no change" from current practices, or continuing with the present course of action until that action is changed. The No Action Alternative in the EA assumes that the Proposed Action would not occur.

## Summary of Environmental Effects

The Proposed Action and alternatives have been reviewed in compliance with the National Environmental Policy Act (NEPA), as implemented by Council on Environmental Quality and U.S. Air Force regulations. The analysis focuses on the following environmental resources: noise, air quality, airspace, infrastructure and transportation, water resources, biological resources, cultural resources, hazardous materials and wastes, health and safety, and socioeconomics and recreation. A cumulative effects assessment was also conducted. The analysis in the EA for each of the environmental resource areas listed above identified negligible to minor adverse and beneficial effects under the Proposed Action. Potential environmental effects are not expected to be significant. A summary of the environmental consequences for each resource area follows each resource area narrative in Section 3 of the EA.

## Stakeholder Involvement

Based on the description of the Proposed Action as set forth in the EA, all activities have been found to comply with the criteria or standards of environmental quality. Coordination with appropriate federal, state, and local agencies regarding this EA is being completed. The attached EA and this FONSI/FONPA are being made available to the public for a 30-day review period. Agencies are receiving coordination throughout the EA development process, and their comments are being addressed as part of the analysis of potential environmental effects performed in the EA.

## Finding of No Practicable Alternative

Executive Order (EO) 11988, *Floodplain Management*, requires federal agencies to avoid, to the maximum extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of development in a floodplain wherever there is a practicable alternative. If it is found that there is no practicable alternative, the agency must minimize potential harm to the floodplain and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted flood proofing and flood protection, such as diverting water away from the site of development and implementing stormwater best management practices.

Two facilities proposed for the SOMXS munitions storage area and an alternative to expand Building 4675 to accommodate the proposed 551st SOS MC-130J aircraft simulator facility would occur fully or partially in the 100-year floodplain (see Figure 3-4 of the EA), and these are the best solutions to accommodate the project purpose and need. The two munitions storage area facilities would be sited near the fringe of the mapped floodplain, and no actual flood events from overflow of North Playa Lake have been recorded as reaching these fringe areas. Given the requirement to cluster groups of munitions storage facilities, set back groups of

munitions storage facilities away from other infrastructure, the need to construct within the existing ESQD arc without expanding the arc, and the limited space available within the munitions storage area, there is no other practicable alternative for these two facilities that avoids the mapped floodplain. One of the two proposed storage facility sites is on the mapped floodplain boundary and could be reconfigured to avoid the mapped floodplain during project design. The 551st SOS simulator alternative would entail construction of an annex to existing Building 4675, which is currently used for similar fuselage training and is already present within the floodplain. This alternative must be co-located with other like functions and infrastructure, and this site cannot avoid the floodplain in the installation's Southeast Development District.

Proposed construction in the floodplain would increase impervious surface area and constrict stormwater runoff, resulting in long-term, minor, adverse effects on the floodplain. Adverse effects would be minimized through design, siting, proper implementation of environmental protection measures described in Section 3.5.3.1 of the EA, and floodproofing as required. Additionally, long-term, minor, beneficial effects on the floodplain would occur from demolition of Building 2127 in the munitions storage area due to the reduction of impervious surfaces. Therefore, no significant effects on the 100-year floodplain would be expected.

A *Notice for Early Public Review of a Proposed Action in a 100-Year Floodplain* was published in the Eastern New Mexico News on November 18, 2018. No comments were received in response to this notice.

Pursuant to EO 11988 and the authority delegated in Headquarters Air Force Mission Directive 1-18, and in consideration of the findings of the EA, I find that there is no practicable alternative to this action and that these projects include all practicable measures to minimize harm to the environment. This decision has been made after taking into account all submitted information and considering a range of reasonable alternatives that will meet project requirements and are within the legal authority of the U.S. Air Force.

## Finding of No Significant Impact

Based on the information and analysis presented in the EA and on review of the public and agency comments submitted during the 30-day public comment period, I conclude that the environmental impacts of implementing aircraft realignment and beddown activities at Cannon AFB are not significant, that preparation of an Environmental Impact Statement is unnecessary, and that a FONSI/FONPA is appropriate.

MICHAEL C. JOHNSON, Colonel, USAF
Deputy Director, Logistics, Engineering &
Force Protection

Date

Attachment: *EA Addressing Aircraft Realignment and Beddown Activities at Cannon AFB, New Mexico.*

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| °F | degrees Fahrenheit |
| ACAM | Air Conformity Applicability Model |
| ACM | asbestos-containing material |
| AFB | Air Force Base |
| AFI | Air Force Instruction |
| AFOSH | Air Force Occupational Safety and Health |
| AFR | Air Force Range |
| AFSOC | Air Force Special Operations Command |
| AGL | above ground level |
| AICUZ | Air Installations Compatible Use Zones |
| AOC | area of concern |
| APE | area of potential effect |
| APZ | accident potential zone |
| AQCR | Air Quality Control Region |
| ARTCC | Air Route Traffic Control Center |
| AST | aboveground storage tank |
| ATC | air traffic control |
| ATCAA | Air Traffic Control-Assigned Airspace |
| BASH | Bird/Wildlife Aircraft Strike Hazard |
| BMP | best management practice |
| CAA | Clean Air Act |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| COA | Certificate of Authorization |
| CWA | Clean Water Act |
| CZ | clear zone |
| dB | decibel |
| dBA | A-weighted decibel |
| *de minimis* | of minimal importance |
| DNL | day-night average sound level |
| DoD | Department of Defense |
| DZ | drop zone |
| EA | Environmental Assessment |
| EIAP | Environmental Impact Analysis Process |
| EIS | Environmental Impact Statement |
| EISA | Energy Independence and Security Act |
| EO | Executive Order |
| ERP | Environmental Restoration Program |
| ESA | Endangered Species Act |
| ESCP | Erosion and Sediment Control Plan |
| ESQD | explosive safety quantity-distance |
| FAA | Federal Aviation Administration |
| FEMA | Federal Emergency Management Agency |
| FL | Flight level |
| FONSI | Finding of No Significant Impact |
| FONPA | Finding of No Practicable Alternative |
| $ft^2$ | square foot/feet |
| FY | fiscal year |
| GCR | general conformity rule |
| GHG | greenhouse gas |
| HLZ | helicopter landing zone |
| HQ | Headquarters |
| I- | Interstate |
| IDEA | Installation Development EA |
| IDP | Installation Development Plan |
| IFR | Instrument Flight Rules |
| IR | Instrument Route |
| IRP | Installation Restoration Program |
| Jet A | Jet A aviation fuel |
| JO | Joint Order |
| LBP | lead-based paint |
| $L_{eq}$ | equivalent sound level |
| $L_{max}$ | maximum sound level |
| LTO | landing and take-off |
| LZ | landing zone |
| MBTA | Migratory Bird Treaty Act |
| mgd | Million gallons per day |
| mm | millimeter |
| MMRP | Military Munitions Response Program |
| MMT | million metric tons |

| | |
|---|---|
| MOA | Military Operating Area |
| MSL | mean sea level |
| MTR | Military Training Route |
| NAAQS | National Ambient Air Quality Standards |
| NAS | National Airspace System |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NM | New Mexico State Highway |
| NMAC | New Mexico Administrative Code |
| NMDGF | New Mexico Department of Game and Fish |
| NMED | New Mexico Environment Department |
| $NO_2$ | nitrogen dioxide |
| NOA | Notice of Availability |
| $NO_x$ | oxides of nitrogen |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| $O_3$ | ozone |
| OSHA | Occupational Safety and Health Administration |
| PCB | polychlorinated biphenyl |
| $PM_{2.5}$ | 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 |
| ppb | parts per billion |
| PPE | personal protective equipment |
| ppm | parts per million |
| PW | production well |
| RCRA | Resource Conservation and Recovery Act |
| RMT | Realistic Military Training |
| ROI | region of influence |
| RONA | Record of Non-Applicability |
| RPA | remotely piloted aircraft |
| SEL | sound exposure level |
| SERE | Survival Evasion Resistance Escape |
| SGCN | Species of Greatest Conservation Need |
| SHPO | State Historic Preservation Officer |
| SIP | state implementation plan |
| $SO_2$ | sulfur dioxide |
| SOF | Special Operations Forces |
| SOMXS | Special Operations Maintenance Squadron |
| SOS | Special Operations Squadron |
| SOSS | Special Operations Support Squadron |
| SOW | Special Operations Wing |
| $SO_x$ | oxides of sulfur |
| SR | slow route |
| SUA | special use airspace |
| SWMU | solid waste management unit |
| tpy | tons per year |
| USACE | U.S. Army Corps of Engineers |
| USAF | U.S. Air Force |
| USC | United States Code |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| $\mu g/m^3$ | micrograms per cubic meter |
| VFR | Visual Flight Rules |
| VR | Visual Route |
| VOC | volatile organic compound |
| VOR | very high frequency omnidirectional range |
| WWTP | Wastewater Treatment Plant |

## Cover Sheet

## Draft Environmental Assessment Addressing Aircraft Realignment and Beddown Activities at Cannon Air Force Base, New Mexico

**Responsible Agencies:** U.S. Air Force (USAF), Air Force Special Operations Command (AFSOC), 27th Special Operations Wing.

**Affected Location:** Cannon Air Force Base (AFB) and northeastern New Mexico.

**Proposed Action:** Aircraft Realignment and Beddown Activities for Cannon AFB.

**Report Designation:** Draft Environmental Assessment (EA).

**Abstract:** Cannon AFB and the Air Force Special Operations Command identified a priority to update aircraft realignment and beddown actions. Six component actions require updating from the original baseline level of activities to continue the Cannon AFB mission through 2026. These programs include 9th Special Operations Squadron (SOS) expansion of the MC-130J aircraft mission, an increase in 12/3/33rd SOS personnel and training for the MQ-9 Reaper remotely piloted aircraft, 16th SOS upgrade of AC-130W aircraft, 27th Special Operations Support Squadron (SOSS) water safety training updates, 551st SOS addition of flight simulators, and 27th Special Operations Maintenance Squadron munitions storage area upgrades. These programs, which would update similar activities identified in the *2007 Environmental Impact Statement for AFSOC Assets Beddown at Cannon AFB*, include increases in personnel, aircraft, and training levels and facility demolition and construction.

The EA evaluates the potential for environmental impacts associated with the Proposed Action and alternatives, including the No Action Alternative, and assists in determining whether a Finding of No Significant Impact/Finding of No Practicable Alternative can be prepared or an Environmental Impact Statement is required. While it has the potential to impact floodplains, the Proposed Action includes all practical measures to minimize harm to floodplains and other sensitive environments. Resource areas considered in the impact analysis for this EA are noise, air quality, airspace, land use, infrastructure/transportation, geological resources, water resources, biological resources, cultural resources, hazardous materials and wastes, health and safety, socioeconomic resources, and environmental justice.

Written comments and inquiries regarding this document should be directed to: Attn: Draft Realignment/Beddown EA, 27th Special Operations Civil Engineer Squadron, 506 North Air Commando Way, Cannon AFB, New Mexico 88103.

**PRIVACY ADVISORY FOR DRAFT EA ADDRESSING AIRCRAFT REALIGNMENT AND BEDDOWN ACTIVITIES AT CANNON AFB, NEW MEXICO**

This Draft EA is provided for public comment in accordance with the National Environmental Policy Act, the President's Council on Environmental Quality National Environmental Policy Act Regulations (40 Code of Federal Regulations §§ 1500–1508), and 32 Code of Federal Regulations § 989, *Environmental Impact Analysis Process*.

The Environmental Impact Analysis Process provides an opportunity for public input on USAF decision making, allows the public to offer inputs on alternative ways for USAF to accomplish what it is proposing, and solicits comments on USAF's analysis of environmental effects.

Public commenting allows USAF 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 portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal information, home addresses, telephone numbers, and email addresses will not be published in the Final EA.

*Draft*

# ENVIRONMENTAL ASSESSMENT

## ADDRESSING
## AIRCRAFT REALIGNMENT AND BEDDOWN ACTIVITIES
## AT
## CANNON AIR FORCE BASE, NEW MEXICO

***Prepared for:***

**Department of the Air Force**

**NOVEMBER 2019**

*This page intentionally left blank.*

# Table of Contents

## Appendices



## Figures

# Tables

# 1. Purpose of and Need for the Proposed Action

## 1.1 Introduction

Cannon Air Force Base (AFB) hosts the 27th Special Operations Wing (SOW), which is one of four U.S. Air Force (USAF) active duty SOWs within Air Force Special Operations Command (AFSOC). The Wing's core missions include close air support, agile combat support, information operations, precision strike, forward presence and engagement, intelligence, surveillance and reconnaissance operations, and specialized mobility. The 27th SOW is a pivotal component of AFSOC's ability to provide and conduct special operations missions ranging from precision application of firepower to infiltration, exfiltration, resupply, and refueling of special operations forces.

Cannon AFB and AFSOC identified the need to update aircraft realignment and beddown activities for the installation's mission. Six activities or component actions require updating to facilitate continuity of Cannon AFB mission readiness from its original baseline level of activities through 2026. The realignment and beddown component actions would modernize the AFSOC fleet and provide improved facilities and infrastructure at Cannon AFB. These component actions include 9th Special Operations Squadron (SOS) expansion of the MC-130J aircraft mission; increase in 12/3/33rd SOS personnel and training for the MQ-9 Reaper remotely piloted aircraft (RPA); 16th SOS upgrade of its AC-130W aircraft; 27th Special Operations Support Squadron (SOSS) water safety training aerial component addition; 551st SOS expansion of flight simulators; and 27th Special Operations Maintenance Squadron (SOMXS) munitions storage area upgrades. These programs, which would update some activities identified in the *2007 Environmental Impact Statement (EIS) for AFSOC Assets Beddown at Cannon AFB* (CAFB 2007) (henceforth referred to as the Cannon AFB Assets EIS), include increases in personnel, aircraft, and aircraft operational training levels; demolition; and facility construction.

The 9th SOS commands a fleet of MC-130 aircraft, which are multi-mission (infiltration, exfiltration, and resupply by airdrop or landing) combat cargo transport and special operations tankers whose primary function is to conduct air refueling of Special Operations Force helicopter/tiltrotor aircraft. The 12th SOS launches and recovers MQ-9 Reaper RPAs that the squadron operates. The 16th SOS uses the AC-130 "attack" variant of the C-130 airframe for close air support, target strikes, and aerial reconnaissance. The 551st SOS provides flight and simulator training support to personnel for a variety of aircraft on the installation. USAF Survival Evasion Resistance Escape (SERE) training is managed by the 27th SOSS at Cannon AFB, and the SERE program is designed to provide realistic training for a variety of survival scenarios in order to prepare aircrews to survive emergency situations. The 27th SOMXS provides munitions and weapons systems maintenance, logistics, and storage support for the squadrons and their aircraft on the installation.

This Environmental Assessment (EA) is being prepared to evaluate the potential environmental impacts of these proposed component actions in compliance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code § 4331 et seq.), regulations of the President's Council on Environmental Quality that implement NEPA procedures (40 Code of

Federal Regulations [CFR] §§ 1500–1508), and USAF regulations for implementing NEPA (32 CFR § 989) *Environmental Impact Analysis Process* (EIAP).

The AFSOC mission was designated to Cannon AFB in 2006. The 2007 Cannon AFB Assets EIS evaluated environmental impacts under NEPA for anticipated mission requirements at Cannon AFB through approximately 2014. The beddown and training of AFSOC assets at Cannon AFB (including RPAs, C-130s, and CV-22 Osprey tiltrotor aircraft), nearby Melrose Air Force Range (AFR), and the installation's airspace allowed AFSOC to meet expanded mission requirements. Updates to infrastructure and facilities on Cannon AFB, the addition of two live-fire training complexes at Melrose AFR, and updates to airspace based on the AFSOC mission were incorporated into the EIS. Mission requirements have evolved since the EIS was completed, and the six component actions being analyzed under the Proposed Action in this EA would improve AFSOC mission readiness through 2026.

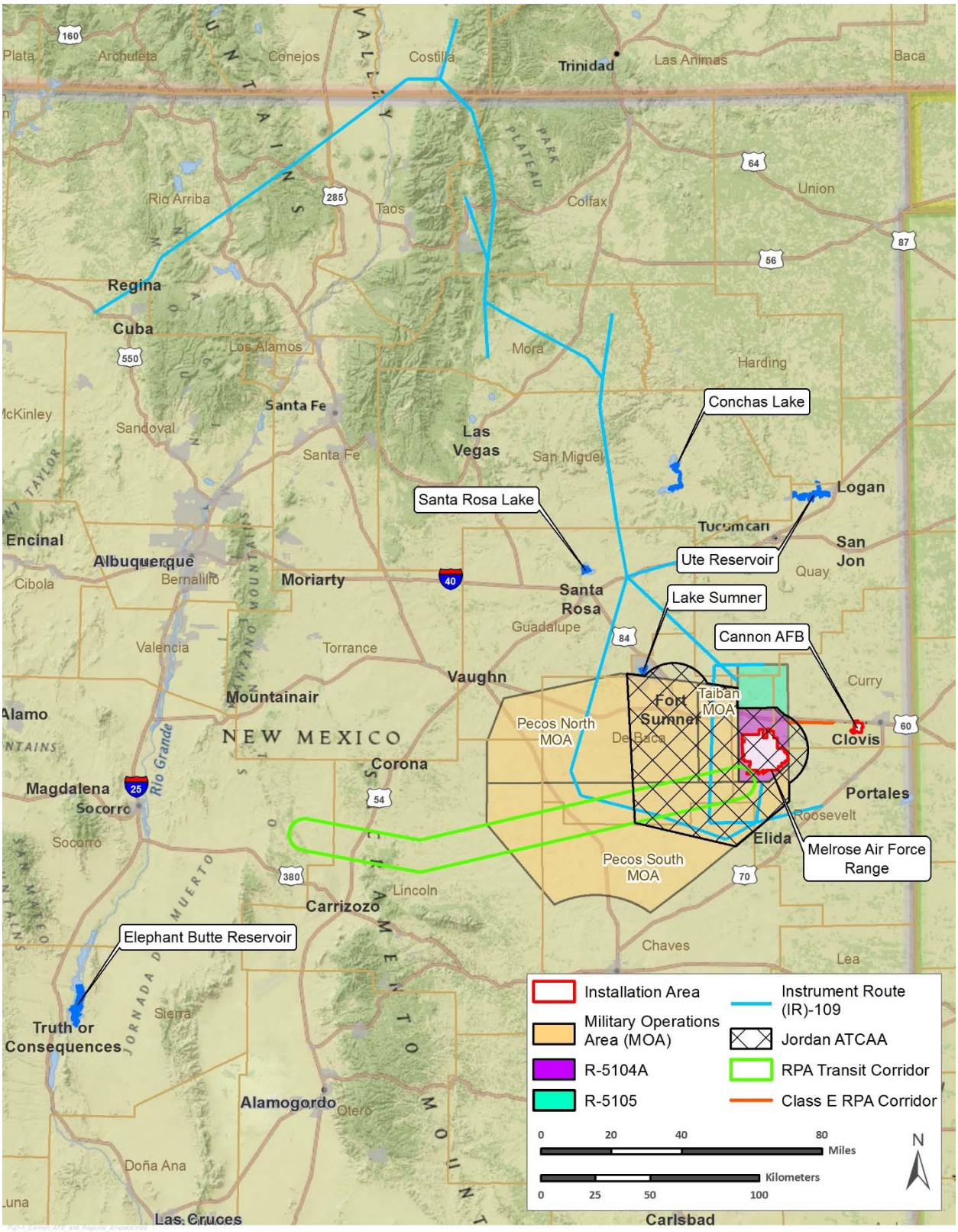
Low altitude training in regional airspace for the 27th SOW was analyzed in the 2007 Cannon AFB Assets EIS (Cannon AFB 2007). Military Operations Areas (MOAs), restricted airspace, and military training routes (MTRs) established near Cannon AFB by the USAF support AFSOC low level, night, and other training missions. Limited low level navigational training currently occurs at altitudes between 100 and 1,000 feet above ground level (AGL).

Melrose AFR has a Comprehensive Range Plan (AFSOC 2014) that was analyzed for environmental impacts under NEPA in the *Environmental Assessment for Utilization Enhancements at Melrose AFR* (AFSOC 2016). The Comprehensive Range Plan includes descriptions of approach and landing procedures, CV-22 nighttime sorties, formation training, alternate insertion and troop extraction activities, RPA operations, and explosive and non-explosive munitions training.

Cannon AFB is in eastern New Mexico near the Texas panhandle, approximately 8 miles west of Clovis, New Mexico, and occupies 4,397 acres of land. It was established during World War II and has hosted a variety of missions and aircraft types throughout its history. In 2007, Cannon AFB became home to the 27th SOW, which operates CV-22, C-130, MQ-9, and other aircraft. These aircraft train in special use airspace (SUA) for military flight operations and training (see **Figure 1-1**). SUA usually consists of prohibited areas, restricted airspace (noted with R designator), MOAs, MTRs, and controlled firing areas.

With this EA, 27th SOW and Headquarters (HQ) AFSOC intends to streamline NEPA compliance and facilitate the aircraft realignment and beddown process by evaluating in one integrated document the potential impacts on the natural and human environment from the component actions proposed for execution at Cannon AFB.

The information presented in this EA will serve as the basis for deciding whether the Proposed Action would result in a significant impact on the natural and human environment, requiring the preparation of an EIS, or whether no significant impacts would occur, in which case a Finding of No Significant Impact (FONSI) would be appropriate. The execution of the component actions would involve activities in a floodplain under Executive Order (EO) 11988, *Floodplain Management*, which means a Finding of No Practicable Alternative (FONPA) would be required in conjunction with the FONSI.




Data Source: National Geographic, Cannon AFB GIS 2017

**Figure 1-1. Cannon AFB and Regional Airspace**

## 1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to support AFSOC mission requirements by improving mission efficiency, upgrading aging aircraft, and accommodating sufficient training capabilities.

The Proposed Action is needed because the AFSOC mission at Cannon AFB continues to grow and evolve, requiring its flight crews to be provided with sufficient training capabilities and associated infrastructure. Improvements and updates are needed to keep pace as warfare grows ever more technologically advanced and specialized.

## 1.3 Interagency/Intergovernmental Coordination and Consultations

### 1.3.1 Interagency Coordination and Consultations

Scoping is an early and open process for developing the breadth of issues to be addressed in a NEPA document and for identifying significant concerns related to a proposed action. Per the requirements of EO 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416 with the same title, federal agencies are required to provide opportunities for consultation with officials of state and local governments that could be affected by a federal proposal.

The process also provides USAF the opportunity to cooperate with and consider state and local views in implementing the federal proposal. **Appendix A** contains the list of agencies consulted during scoping and copies of correspondence.

### 1.3.2 Government to Government Consultations

EO 13175, *Consultation and Coordination with Indian Tribal Governments,* requires federal agencies to consult with Native American tribal governments whose concerning federal policies with tribal implications, which would include activities on federally administered lands. Consistent with the NHPA, Department of Defense (DoD) Instruction 4710.02, *DoD Interactions with Federally-Recognized Tribes*, and Air Force Instruction (AFI) 90-2002, *Air Force Interaction with Federally-Recognized Tribes*, federally recognized tribes that are historically affiliated with the Cannon AFB geographic region will be invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA public involvement or the interagency coordination process, and it requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The Cannon AFB point-of-contact for Native American tribes is the Installation Commander.

**Appendix A** lists the Native American tribal governments that will be coordinated or consulted with regarding component actions proposed in this EA.

### 1.3.3 Other Agency Consultations

Per the requirements of Section 106 of the NHPA and implementing regulations (36 CFR § 800) and Section 7 of the Endangered Species Act (ESA) and implementing regulations (50 CFR § 402), findings of effect and requests for concurrence where appropriate will be transmitted to the New Mexico State Historic Preservation Officer (SHPO) and the U.S. Fish and Wildlife Service

(USFWS), respectively. Results of the consultations and records of correspondence with these agencies are included in **Appendix A**.

## 1.4 Public and Agency Review of the EA

Through the public involvement process for this EA, USAF will notify relevant federal, state, and local agencies and the public of the Proposed Action and request input on environmental concerns they might have regarding the Proposed Action. The public involvement process provides Cannon AFB with the opportunity to consider and address state and local views in its decision regarding implementing this federal proposal.

Because portions of the Proposed Action coincide with 100-year floodplains, it would be subject to the requirements and objectives of EO 11988. USAF published an early notice that the Proposed Action would occur in a floodplain in the newspaper of record (*Eastern New Mexico News*) on November 18, 2018 (see **Appendix A**). The notice identified state and federal regulatory agencies with special expertise that had been contacted and solicited public comment on the Proposed Action and any practicable alternatives. The comment period for public and agency input on these component actions ended 30 days after publication of the notice and no comments were received.

A Notice of Availability (NOA) of the Draft EA and FONSI/FONPA will be published in the *Eastern New Mexico News* announcing the availability of the EA for review after it is developed. The NOA will invite the public to review and comment on the Draft EA. An electronic version of the Draft EA and FONSI/FONPA will be made available for review on the Cannon AFB website at *www.cannon.af.mil* and at the Clovis-Carver Public Library in Clovis, New Mexico. Paper and electronic copies of the Draft EA and FONSI/FONPA will be sent to various agencies identified in **Appendix A** and any interested parties that have requested a copy. The NOA and public and agency comments will be provided in **Appendix A** of the Final EA.

## 1.5 Decision to be Made

This EA evaluates whether the Proposed Action would result in significant impacts on the human environment. If significant impacts are identified, Cannon AFB would undertake mitigation to reduce impacts to below the level of significance, undertake the preparation of an EIS addressing the Proposed Action, or abandon the Proposed Action.

This EA is a planning and decision-making tool that will guide Cannon AFB in implementing the Proposed Action in a manner consistent with mission requirements and USAF standards for environmental stewardship including those identified in 32 CFR § 989.

*This page intentionally left blank.*

# 2. Description of the Proposed Action and Alternatives

## 2.1 Proposed Action

This EA evaluates the potential environmental impacts that may arise from the implementation of the component actions associated with updating the realignment and beddown of aircraft at Cannon AFB through 2026. This document treats each component as a distinct action and considers each component action and its alternatives separately (see **Section 2.3**). These component actions include aircraft realignment and beddown and supporting activities, including personnel transfers, facility construction, training updates, and upgraded munitions storage.

## 2.2 Selection Standards for Project Alternatives

The scope and location of each proposed component action and, where applicable, their alternatives have undergone extensive review by AFSOC personnel and supporting installation and USAF staff specialists.

Potential alternatives to the proposed component actions at Cannon AFB were evaluated against five universal selection standards. Some component actions included project-specific selection standards applicable solely to that single project; project-specific selection standards are introduced in **Section 2.3**, where applicable. The five universal selection standards for project alternatives follow.

**Selection Standard 1:** The alternative must use existing airspace, land, and facilities to the greatest extent possible; avoid creating or maintaining redundant space or infrastructure; avoid or minimize operational inefficiencies; and represent a cost-effective and sustainable alternative.

**Selection Standard 2:** The alternative must be consistent with all Cannon AFB airspace and infrastructure planning efforts, requirements, and documents; comply with relevant legal and regulatory requirements; and accommodate applicable, known man-made and natural development constraints (e.g., explosive safety quantity-distance [ESQD] arcs and floodplains—the relevant constraints vary depending on the project).

**Selection Standard 3:** The alternative must provide for the ability to execute effective and efficient training operations, requiring aircrews to acquire as much training time as possible for practicing missions. As a result, aircraft support and infrastructure such as maintenance facilities and crews must be available to meet these training requirements.

**Selection Standard 4:** For component actions related to aircraft training, the alternative must ensure that training areas can support the full use of aircraft capabilities by having a diverse and realistic training regime. This requires geographically diverse training routes, such as lowlands and mountainous terrain, to accommodate up to 700 low altitude sorties per year.

**Selection Standard 5:** Training must be in proximity to Cannon AFB to reduce the amount of time aircrews are commuting to training areas. A typical mission needs at least 80 percent of its

flying time dedicated to training activities to ensure mission proficiency. Therefore, commuting time to begin training must not exceed 20 percent of flying time during a sortie.

## 2.3 Proposed Actions and Alternatives

NEPA and Council on Environmental Quality regulations mandate the consideration of reasonable alternatives to proposed actions. “Reasonable alternatives” are those that could also be used to meet the purpose of and need for a proposed action.

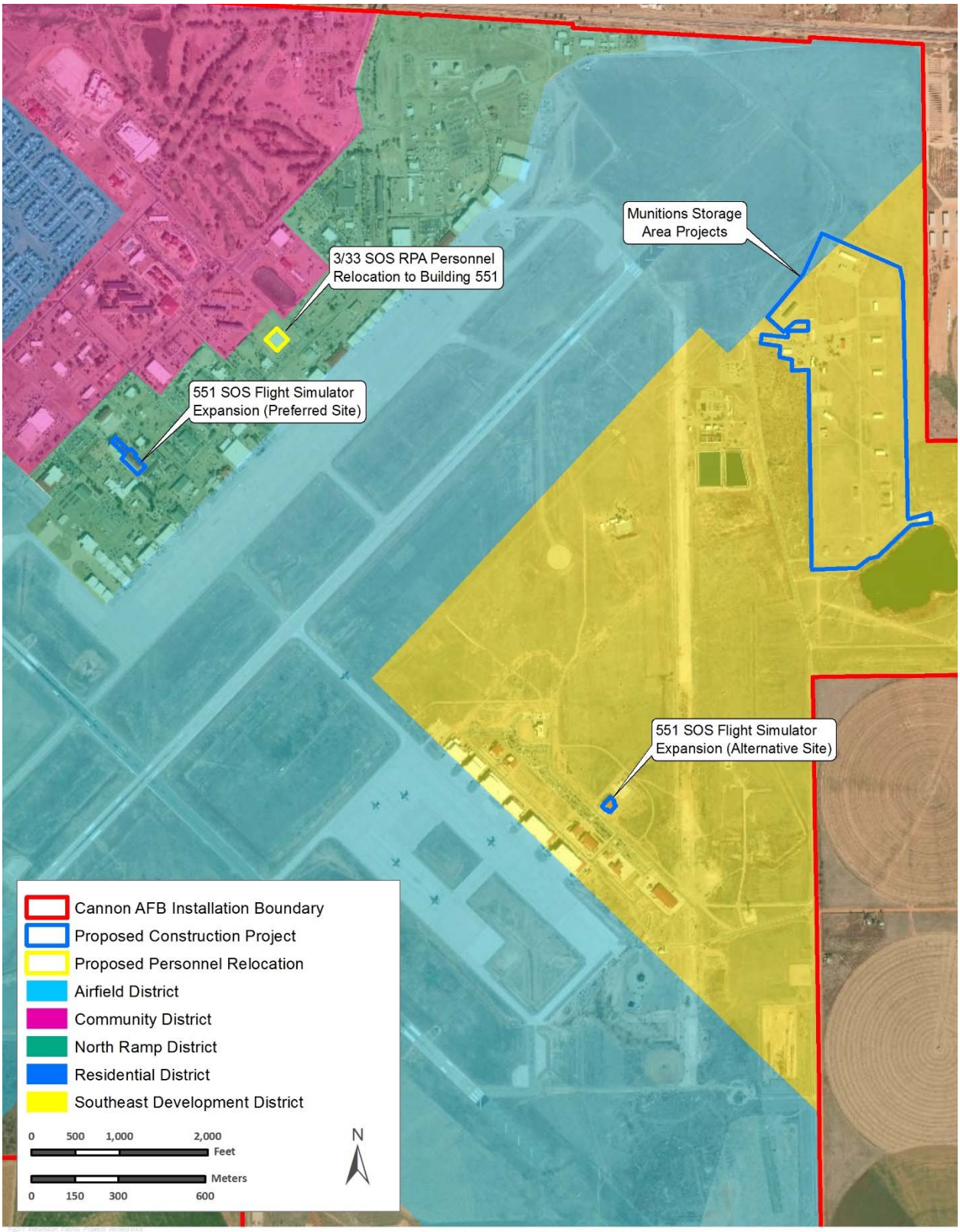
The NEPA process is intended to support flexible, informed decision making; the analysis provided by this EA and feedback from the public and other agencies will inform decisions regarding whether, when, and how to execute the proposed actions. Among the alternatives evaluated for each component action is a No Action Alternative. The No Action Alternative will be carried forward for detailed analysis, consistent with 32 CFR § 989, to provide a baseline against which the impacts of the action alternative can be assessed. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, not simply to conclude no impact.

The scope, location, and objectives of the component actions are described below. This section also presents reasonable and practicable alternatives for component actions where multiple viable courses of action exist. Those alternatives are assessed relative to the universal selection standards and project-specific selection standards, where applicable. Alternatives that meet all five universal selection standards and applicable project-specific selection standards are considered reasonable and retained for consideration in this EA. Alternatives that do not meet one or more of the selection standards are considered unreasonable and are not retained for consideration in this EA.

Activities under the component actions would meet applicable DoD airspace management processes and procedures detailed in AFI 13-201, *Air Force Airspace Management.* AFI 13-201 implements Air Force Planning Document 13-2, *Air Traffic Control, Airspace, Airfield, and Range Management,* and DoD Directive 5030.19, *DoD Responsibilities on Federal Aviation and National Airspace System Matters*.

Component actions that include facility construction would be designed to meet current antiterrorism/force protection requirements, consistent with Unified Facilities Criteria 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings,* and the *U.S. Air Force Installation Force Protection Guide,* and meet Leadership in Energy and Environment Design certification where possible and practicable.

Each of the six component actions is described in detail in the subsections below. Consideration of alternatives for each component action is also discussed. **Figure 2-1** shows facility construction projects and personnel relocation associated with three of the six component actions on the installation; the other three component actions would not include changes in installation infrastructure.




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-1. Installation Facility Component Actions**

### 2.3.1 9th SOS MC-130J Aircraft Increase

AFSOC proposes to realign the MC-130 aircraft fleet by fiscal year (FY) 2030. The 9th SOS would provide aircraft and train current MC-130J aircrews on new and emerging combat systems and tactics, techniques, and procedures in conjunction with the 551st SOS. These actions include implementation of standard aircraft electronics and weapons systems upgrades and additional training in visual airdrop procedures, threat penetration procedures, terrain following radar, and radio frequency countermeasures.

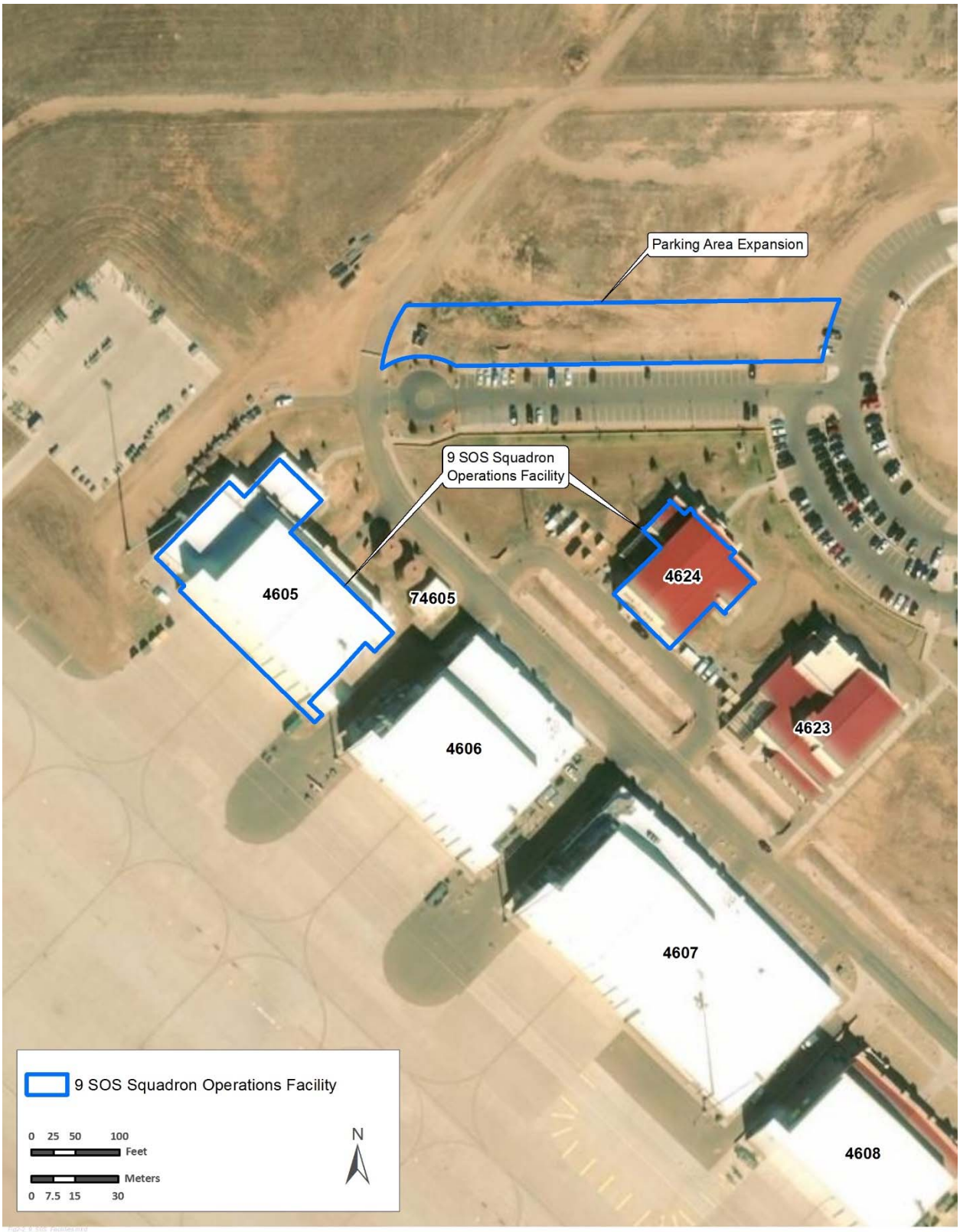
The 9th SOS has 14 MC-130J aircraft and 140 authorized personnel as of FY 2019. In order to meet the modification and training schedule required to provide appropriate capabilities to AFSOC, the number of aircraft and personnel assigned to the 9th SOS would need to increase, with an end state of approximately 18 aircraft and 207 authorized personnel (an end state increase of 4 aircraft and 67 personnel) by FY 2030. These numbers would fluctuate in the interim to as much as 20 aircraft (6 additional) and 241 personnel (101 additional). The purpose of the surge to 20 aircraft would be to allow for additional MC-130J aircraft to be available for training operations prior to transition to other installations. In FY 2020, three aircraft and 25 personnel would be restationed elsewhere, followed by restationing fluctuations at Cannon AFB until an end state of 18 aircraft in FY 2030. **Table 2-1** provides details on approximate 9th SOS aircraft and personnel numbers at Cannon AFB through FY 2030, with percent increase from baseline indicated, and the maximum interim fluctuation in numbers is bolded.

**Table 2-1. Proposed 9th SOS Aircraft, Personnel, and Training Changes to FY 2030**

| Fiscal Year | Aircraft (MC-130) | Authorized Personnel[1] | Flying Hours[2,3] | Simulator Hours[3] |
|---|---|---|---|---|
| Baseline | 14 | 140 | 2,301 | 720 |
| 2019 | **20 (43%)** | **241 (72%)** | **3,958 (72%)** | **1,238 (72%)** |
| 2020-2021 | 17 (21%) | 190 (36%) | 3,129 (36%) | 979 (36%) |
| 2022-2023 | 19 (36%) | 224 (60%) | 3,682 (60%) | 1,152 (60%) |
| 2024 | 18 (29%) | 207 (48%) | 3,405 (48%) | 1,066 (48%) |
| 2025 | 16 (14%) | 173 (24%) | 2,853 (24%) | 893 (24%) |
| 2026-2027 | 18 (29%) | 207 (48%) | 3,405 (48%) | 1,066 (48%) |
| 2028-2029 | 17 (21%) | 190 (36%) | 3,129 (36%) | 979 (36%) |
| 2030 steady state | 18 (29%) | 207 (48%) | 3,405 (48%) | 1,066 (48%) |
| Maximum interim change | 6 (43%) | 101 (72%) | 1,657 (72%) | 518 (72%) |
| End state change from baseline | 4 (29%) | 67 (48%) | 1,104 (48%) | 346 (48%) |

[1] Personnel numbers do not include an increase of 72 Aircraft Maintenance Unit staff.
[2] Hours do not include 309 flight training hours required to support the 14th Weapons Squadron.
[3] The increase in hours per year is commensurate with the increase in personnel.

The increase in aircraft would bring a corresponding increase in personnel, mission activity, and use of materials (fuel, etc.). In addition to the increase in personnel at the 9th SOS, the 9th Aircraft Maintenance Unit would grow from 378 to approximately 450 personnel, all of whom would be housed on the installation. All 9th SOS and 9th Aircraft Maintenance Unit personnel would be based in Building 4624 (17,017 square feet [ft$^2$]), the 9th SOS Squadron Operations Facility, and Building 4605 (35,300 ft$^2$) in the Southeast Development District of the installation. One paved or gravel parking lot consisting of approximately 100 spaces and covering approximately 0.8 acres would be constructed near Buildings 4624 and 4605, on a level site adjacent to the north of an existing lot north of these facilities (see **Figure 2-2**).




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-2. 9th SOS Facilities and Proposed Parking Lot**

Training activities would increase by a maximum of two flights per night (two takeoffs and two landings, which is four operations). To minimize potential noise impacts at night, low-level night flight timing would remain consistent with existing night activities. Therefore, training typically would begin as early after dark as possible (6 p.m. to 9 p.m., depending on the season) and last for 4 to 5 hours. Single aircraft training flights would be consolidated into squad flights with more aircraft. The increase in aircraft would result in increased use of Melrose AFR, Taiban and Pecos Military Operating Areas, and military training routes for military aircraft throughout New Mexico, in particular Instrument Route (IR)-109, which is used by the 9th SOS (see **Figure 1-1**). No changes in airspace would be required under this component action. The increase in aircraft would require the 9th SOS to maximize training activities during air operations. Aircraft would continue to fly training missions in both directions in IR-109 to ensure training missions spend most of their flying time training.

The 9th SOS aircraft do not carry munitions, only countermeasures such as chaff, flares, and radar. Approximately 9,209 countermeasures were used during training activities in FY 2018. Based on the four aircraft (28 percent) increase end state and a 48 percent increase in flying hours and simulator hours (see **Table 2-1**), a similar increase in countermeasures usage during training activities would be expected.

On-installation infrastructure and fuel capacity to support the increase in aircraft already exists, so no fuel system upgrades would be required. The main runway (04/22) on Cannon AFB is proposed to be resurfaced by 2022 under a separate action. Runway replacement, which would require separate NEPA analysis, is not expected at this time.

**Additional Component-Specific Selection Standards:** None.

**Alternatives Considered for this Component Action:** After reviewing the available alternatives, no other reasonable alternatives were identified that meet the selection standards. Under the Preferred Alternative for this component action, the increase of 9th SOS aircraft and personnel as described above would incur a proportional increase in flight and simulator hours to the increase in assigned aircrews (see **Table 2-1**). See **Section 2.3.5** regarding flight simulator facility expansion.

Under the No Action Alternative, the increase of 9th SOS aircraft and personnel would not occur and AFSOC assets would continue to be maintained and operated as they are at different installations, resulting in mission and training inefficiencies. This does not support the purpose of and need for realignment, as described in **Section 1.2**.

**Alternatives Considered but Eliminated from Further Analysis:** No alternatives were were eliminated from further analysis.

### 2.3.2 12/3/33rd SOS MQ-9 Reaper Remotely Piloted Aircraft (RPA) Personnel and Training Increase

The MQ-9 Reaper is an armed, medium-altitude, long-endurance RPA used primarily against dynamic execution targets and secondarily as an intelligence gathering asset. A typical operation requires a launch-and-recovery station for takeoff and landing operations managed by the 12th SOS at Cannon AFB and Melrose AFR, and a separate crew from either the 3rd or 33rd SOS that executes command and control of the remainder of the mission. The MQ-9

Reaper RPA mission at Cannon AFB would be expanded with additional aircrews. The 12th SOS at Cannon AFB is authorized for 20 RPA aircraft and an end state of 132 personnel; however, only 6 RPAs are present on the installation. The remaining aircraft are currently stationed away from Cannon AFB. No increase of 12th SOS personnel is proposed. The number of 3/33rd SOS personnel would increase from approximately 324 to 349 personnel (25 additional) under this component action to meet increased mission requirements. An increase in training activities as a result of personnel increases in these squadrons would result in increased use of materials (e.g., fuel). No additional supporting infrastructure would be required for the increase of 85 personnel. The 12th SOS occupies Building 4620, and the 3/33rd SOS currently occupy Building 848. The 3/33rd SOS personnel would move to unused Building 551, which has the requisite space, parking, and utilities to accommodate the personnel increase under this component action (see **Figure 2-3**). RPA training for the 12/3/33rd SOS would increase from 17 to 30 hours per week to and from Melrose AFR.

**Additional Component-Specific Selection Standards:** None.

**Alternatives Considered for this Component Action:** After reviewing the available alternatives, no other reasonable alternatives were identified that meet the selection standards. Under the Preferred Alternative for this component action, MQ-9 RPA squadrons would have an increase in personnel as described above. This increase would result in a 13-hour per week increase in training activities. Training activities would use Melrose AFR; however, air-based operations would originate and terminate at Cannon AFB and not at Melrose AFR. No changes in airspace would be required under this component action.

Under the No Action Alternative, the number of MQ-9 SOS personnel and associated training would not increase at Cannon AFB. This alternative does not support the purpose of and need for realignment, as described in **Section 1.2**.

**Alternatives Considered but Eliminated from Further Analysis:** An alternative considered would have transitioned MQ-9 RPA from Cannon AFB to Hurlburt Field, Florida. However, this alternative would not meet the purpose and need described in **Section 1.2** and would limit the 27th SOW's ability to maintain mission readiness. In addition, Hurlburt Field is already being considered for a separate MQ-9 squadron. Therefore, this alternative was eliminated from further analysis.

### 2.3.3 16th SOS Upgrade of the AC-130W to AC-130J and AC-130J Increase

The 16th SOS currently has 12 AC-130W gunship aircraft that are all scheduled to receive electronics and weapons systems upgrades, which would include the addition of an upgraded 105-millimeter (mm) Howitzer gun as a quick reaction combat system. As the AC-130W aircraft on Cannon AFB progress through upgrading weapon and targeting systems, they would also be transitioned to the AC-130J aircraft. The purpose of upgrading to the AC-130J airframe is to advance the gunship model to recent AC-130 technology to provide better continual close air support and air interdiction in supporting special operations forces during continued operations.

Five additional AC-130J aircraft would also realign to Cannon AFB for the 16th SOS by FY 2022. No interim surge of aircraft greater than the end-state of five would occur under this component action. The transition to AC-130Js would increase engine performance, reduce


Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-3. RPA Squadron Facility and Personnel Locations**

noise levels, and add advanced weapons systems to the aircraft. The same number of crew members would operate each aircraft; however, the additional weight of the aircraft could increase fuel use and emissions. The 16th SOS and 9th SOS use the same airspace. AC-130Js currently use the following munitions and countermeasures, with training rounds used during training activities. Use of these munitions would increase under this component action:

- Precision Strike Package with 30 mm and 105 mm cannons. Approximately 7,023 30-mm and 3,470 105-mm training rounds were used in FY 2018.
- Countermeasures are used to the same extent that they are for the 9th SOS MC-130 aircraft.

**Additional Component-Specific Selection Standards:** None.

**Alternatives Considered for this Component Action:** After reviewing the available alternatives, no other reasonable alternatives were identified that meet the selection standards. Under the Preferred Alternative, five AC-130J aircraft for the 16th SOS would realign to Cannon AFB. Additionally, 12 AC-130W aircraft already stationed at Cannon AFB would be reconfigured to the AC-130J aircraft, which has advanced electronics and weaponry. The increase of five aircraft (42 percent increase) would include a corresponding increase of approximately 647 flying hours for training and 274 landing and takeoff (LTO) cycles per year. A similar proportional increase in munitions training would require an additional 2,498 30-mm and 1,235 105-mm training rounds per year. Approximately 3,277 additional countermeasures would be used by the additional five aircraft per year. No increase in personnel under this component action is expected.

Under the No Action Alternative, the 16th SOS would not transition to AC-130J aircraft and would not receive four additional AC-130J aircraft. This does not support the purpose of and need for realignment, as described in **Section 1.2**.

**Alternatives Considered but Eliminated from Further Analysis:** An alternative to transfer 16th SOS AC-130W aircraft from Cannon AFB and realign five AC-130J to Hurlburt Field, rather than remaining at Cannon AFB, was considered. However, this alternative would not meet the purpose and need described in **Section 1.2** to upgrade the aging AC-130W fleet at Cannon AFB and would limit 27th SOW's ability to maintain mission readiness. Aircrews would not be able to maximize the use of available airspace capacity at Cannon AFB and would not be able to meet their training requirements. Therefore, Selection Standards 1, 2, 3, and 4 would not be met, and this alternative, along with similar operational alternatives for the 9th SOS dismissed in **Section 2.3.1** that are also applicable to 16th SOS, were eliminated from further analysis.

### 2.3.4 27th SOSS Water Safety Training Aerial Component

The 27th SOSS SERE program at Cannon AFB conducts water safety training up to two times per month at Ute Lake State Park, which is approximately 67 miles north of Cannon AFB (see Ute Reservoir on **Figure 1-1**). AFI 11-202, Volume 1, *Aircrew Training*, and its Mission Design Series-specific supplements require aircrews to maintain proficiency in water survival skills. Training uses one 20-foot training boat and a smaller safety boat, which are stowed at a nearby storage facility. There are two training locations accessed through public boat ramps with the permission of the State Park, a primary site in the northeastern portion of Ute Reservoir at the

North Area boat ramp and an alternate site at the Logan Park boat ramp (see **Figure 2-4**). Coordination of training activities would occur with the State Park to ensure lake visitors are aware of the training prior to its designation. Current training activities involve 6 to 15 students, with an allowable maximum of 20 students, that are placed in the water and towed for up to 15 seconds to simulate parachute dragging. The only materials used during water safety training are approved dye markers designed to mark open water rescue locations, and fuel and oil for the boat engines. Public access to the reservoir is not restricted during training activities. The 2007 Cannon AFB Assets EIS addressed the current level of water safety training. The current water safety training program is proposed to be modified by adding an aerial component (low and slow approach and hoist and release training) to the SERE training mission.

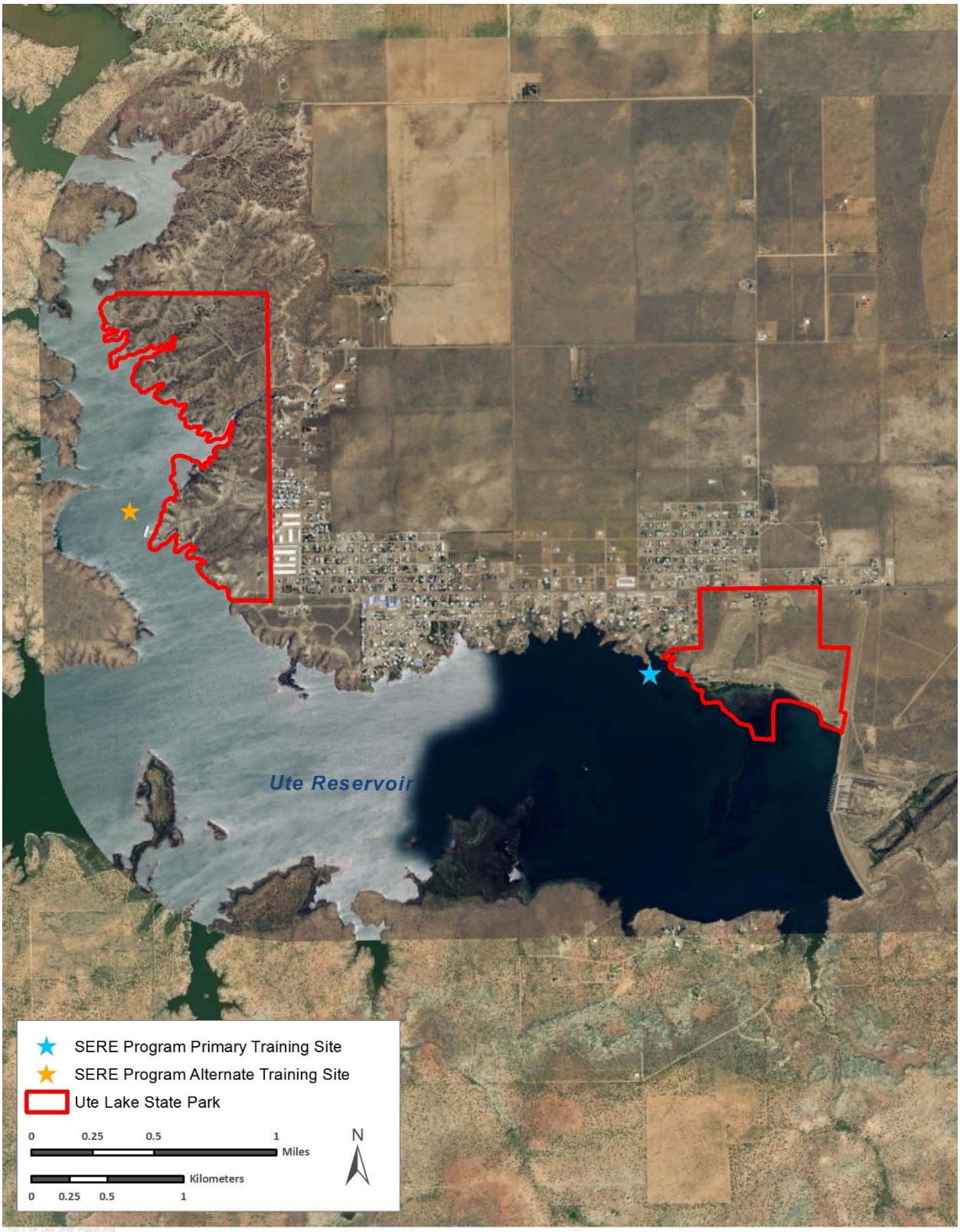
The low and slow approach would deliver combat rubber raiding craft and swimmers into the water. The approach would be initiated from 100 feet above the water surface by a CV-22 aircraft and then initiate a descent to 10 feet above the water surface. The CV-22 would remain at 10 feet for approximately 20 seconds and then climb to 100 feet. Most operations at the reservoir training location would be simulated deliveries but occasionally would have live deliveries of swimmers or combat rubber raiding craft. A gas-powered safety boat would accompany all live water operations (day and night). This boat would be in position near the training location prior to initiating live water operations. No equipment would be left routinely unattended or stored overnight at the training location.

For hoist and release training, CV-22s would hover approximately 100 feet over the water. A crewman would lower a recovery device into the water attached to a metal hoist cable and, after a short delay, the cable would be reeled back into the CV-22. Most hoist operations would be simulated; however, occasionally live swimmer training would be conducted. During retrieval, students would be in the water, hoisted 20 to 30 feet up, then released. Training would be conducted in water 50 to 70 feet deep, and a safety boat would be required for all live hoist operations. CV-22s would not land at Ute Lake State Park, and no helicopter landing zone is proposed. No airspace modification would be required under this component action.

CV-22s would deploy once every 3 weeks and would conduct training activities at the reservoir for 20 to 30 minutes. CV-22s would transit from Cannon AFB to the reservoir at elevations between 500 and 1,000 feet AGL using established airspace routes, and remain in contact with air traffic control during transit.

**Additional Component-Specific Selection Standards:** Water training sites require the following operational, safety, and environmental considerations:

- The training site must be within an area free of obstructions (e.g., towers, wires) that could make aircraft operations hazardous.
- The training site must be within a 2-hour drive of Cannon AFB and allow for vehicular access to training sites to support training activities.
- Training sites should be large enough to accommodate CV-22 aircraft hovering and are to avoid populated areas, residential units, ranches, or other noise-sensitive areas with a 1,000-foot buffer.




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-4. Ute Reservoir SERE Program**

**Alternatives Considered for this Component Action:** After reviewing the available alternatives, Cannon AFB identified two alternatives meeting the selection standards.

- Under the Preferred Alternative, the current 27th SOSS SERE training mission would be supplemented by using CV-22 aircraft for "low and slow" and "hoist and release" training at Ute Reservoir as described above.

  Training at Ute Reservoir would be conducted day and night on days when the park has the fewest visitors during the workweek (typically Tuesday). CV-22s would avoid water training on the weekend due to higher civilian usage of Ute Reservoir. The expected frequency of water operations would be up to two daytime sorties per month and four nighttime sorties per month. Cannon AFB would coordinate with New Mexico State Parks regarding these activities. Most training would be conducted using a single CV-22; however, two CV-22s could occasionally sequence into water operations on the same day or night. Six to 12 swimmers would be in the water during live water operations. CV-22s would avoid civilian boats by no less than 1,000 feet horizontally while conducting water operations. If this is not possible due to civilian traffic, CV-22s would terminate water operations.

  The minimum water depth required for water operations employing live swimmers is 10 feet deep (with no restriction for water operations not employing live personnel); however, CV-22s would remain in the middle of Ute Reservoir (as far from all shorelines as possible) over deeper water while conducting water operations. CV-22s conducting water operations would fly patterns between 500 and 1,000 feet AGL and toward the south side of the reservoir to avoid populated areas.

- Under a second alternative for this component action, water safety training using CV-22s would be similar to the Preferred Alternative but would instead occur at Conchas Lake, which is an additional 5 minutes flight time over Ute Reservoir and additional driving time for the safety boat operators from Cannon AFB. The lake has the size and depth to support CV-22 operations.
- Under the No Action Alternative, no aerial component would be added to the SERE training mission at Cannon AFB. To complete the required aerial component of the training, personnel would have to be placed on temporary duty assignment to Hurlburt Field, Florida.

**Alternatives Considered but Eliminated from Further Analysis:** An alternative site for CV-22 training was considered at Elephant Butte Lake, approximately 250 miles southwest of the installation; however, this site would add an additional hour of flight transit operations (30 minutes each way when compared with transit to Ute Reservoir). This would require excessive time commuting in flight, which would not meet Selection Standards 3 and 5. Other potential sites included Santa Rosa Lake and Sumner Lake in New Mexico; however, these sites do not meet Selection Standard 1 and the component-specific selection standards because these lakes are over 1 mile shorter than Ute Reservoir or Conchas Lake on their long axes. This results in operational inefficiencies and presents increased safety concerns when accommodating proposed CV-22 operations during water safety training. Therefore, these alternatives were eliminated from further analysis.

### 2.3.5 551st SOS Expansion of Flight Simulators

The MC-130J system upgrades for the 9th SOS described in **Section 2.3.1** would require modifications to the existing MC-130 Weapons System Trainer and "Flight Deck" Trainer simulation systems currently operated by the 551st SOS in Building 724. The addition of 9th SOS and 3/33rd SOS personnel to the installation as previously noted would require additional training in simulators and would require the 551st SOS to expand its supplemental classroom training. The 9th SOS would augment the 551st SOS with instructors to further train students after their initial flight training at Kirtland AFB, New Mexico.

The 551st SOS currently runs approximately two simulations 4 days a week. The proposed increase in simulations could run continuously throughout the day (24 hours) to meet demand. As a result, one existing simulator bay (Echo) that is currently used for storage would be restored to an active simulator and an additional simulator bay (Foxtrot) would be constructed to accommodate the increase.

**Additional Component-Specific Selection Standards:** The new simulator bay is to be sited adjacent to an existing simulator facility to allow continuation of effective and efficient training activities.

**Alternatives Considered for this Component Action:** After reviewing the available alternatives, Cannon AFB identified two sites meeting the selection standards.

- Under the Preferred Alternative for this component action, the existing MC-130J simulator facility would be upgraded by repurposing simulator facility Echo from storage space to a working simulator facility that would operate as described above, and an additional 13,000 $ft^2$ simulator facility (Foxtrot) would be constructed adjacent to the western corner of Building 724 (see **Figure 2-5**). One of the existing simulator bays would have to be taken offline for modification for a short period to make final connections at the end of the construction period. To allow for operators to remain current with their training requirements, there could be an increase in simulator usage prior to going offline. Personnel could also require TDY to other installations to stay current. The MC-130J simulator is also the primary training device that supports Simulator Refresher training for three operational squadrons (in addition to local continuation training).
- Under a second alternative for this component, a similar 12,000 $ft^2$ 551st SOS simulator facility annex for MC-130J fuselage training would be added to Building 4675, effectively doubling its size, in the Southeast Development District (see **Figure 2-6**).
- Under the No Action Alternative, flight simulators would not be upgraded or added and training simulators would be required to operate 24 hours per day or aircrews would have to train off the installation. This would not be an efficient use of training hours and would not be practical considering the amount of personnel that require flight simulator time. This does not support the purpose of and need for realignment, as described in **Section 1.2**.

**Alternatives Considered but Eliminated from Further Analysis:** No alternatives were were eliminated from further analysis.


Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-5. 551st SOS Building 724 Flight Simulator Bay Expansion**


Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-6. 551st SOS Building 4675 Fuselage Training Facility Expansion**

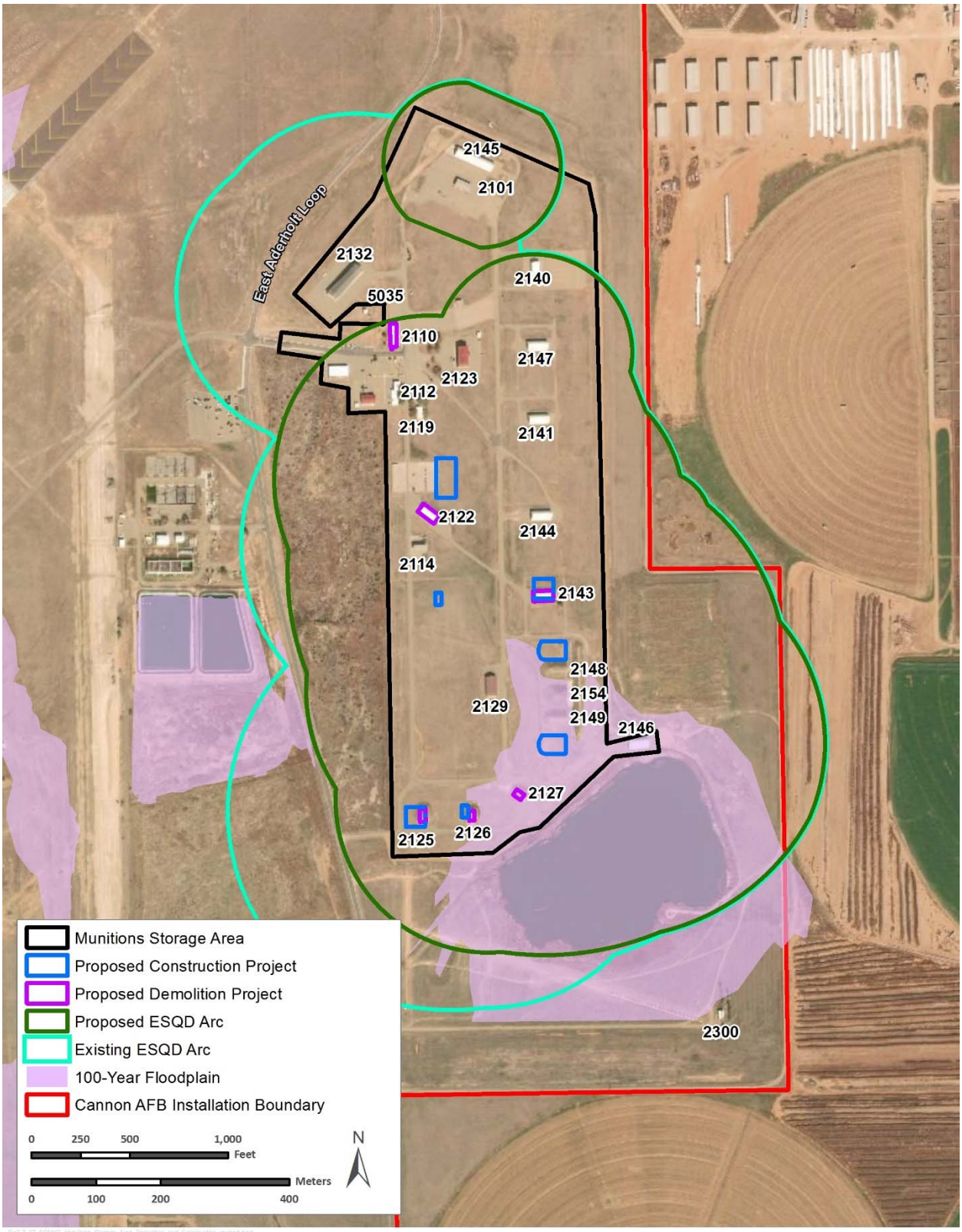
### 2.3.6 27th SOMXS Munitions Storage Area Upgrades

The 92-acre Cannon AFB munitions storage area in the northeastern corner of the installation has a stockpile of over 1,600 items. The munitions storage area is operated by the 27th SOMXS, which is authorized for 92 personnel, and 75,000 $ft^2$ of storage is spread across 14 buildings. Munitions stored in these facilities support 12 flying squadrons, Melrose AFR, the 26 Special Tactics Squadron, explosive ordnance disposal, aircrew flight equipment, and a variety of additional activities. **Figure 2-7** shows the location of proposed demolition and construction activities in the munitions storage area.

Currently, several facilities in the munitions storage area are obsolete and inefficiently storing munitions. The storage area requires several explosive safety waivers due to the re-designation of East Aderholt Loop from low to medium traffic status and the addition of new infrastructure around the munitions storage area. Other issues include the following:

- The public traffic route danger arc around the munitions storage area constrains construction or expansion of facilities south of the installation's runway.
- Building 2110 is being used as an inspection explosive operating location; however, the facility was not designed for this use. The facility is also too close to Building 5035 (Pump House), which limits what can be stored.
- Building 2122 (Conventional Explosive Operating Location) originally was designed to be a 5,000 $ft^2$ aboveground magazine storage facility but is being used as the current operating facility that directly supports daily flying operations. The building accumulates heavy metal dust that requires continuous cleaning for safety purposes.
- Buildings 2125 and 2126 are 2,100 $ft^2$ earth-covered magazine storage facilities that are in proximity to East Aderholt Loop. As a result, they are not compliant with minimum explosive safety standards for DoD facilities.
- Building 2127 is a 2,100 $ft^2$ earth-covered magazine storage facility that was constructed in a floodplain. Stored ammunition and explosives could become waterlogged and are at risk of being unserviceable or damaged. Additionally, the structure's steel doors have become warped and difficult to close.
- Building 2143 is a 5,000 $ft^2$ aboveground magazine storage facility that has numerous holes in the facility walls that allow debris, dust, and wildlife to enter, which presents a security risk.

**Additional Component-Specific Selection Standards:** The munitions storage area upgrades must be sited in areas that do not violate safety standards and provide sufficient space for ESQD arcs. In addition, the portion of the ESQD arc that extends outside the installation boundary must not change substantially.




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 2-7. 27th SOMXS Munitions Storage Area Demolition and Construction**

**Alternatives Considered for this Component Action:** After reviewing the available alternatives, no other reasonable alternatives were identified that meet the selection standards. Under the Preferred Alternative, storage facilities would be upgraded and relocated within the munitions storage area. The upgrades would maximize storage of incompatible munitions, increase storage of war-ready munitions for contingency operations, and be compliant with the *USAF Munitions Facility Standards Guide*. Buildings 2110, 2122, 2125, 2126, 2127, and 2143 would be demolished and replaced with four new storage facilities, a new operations facility, and two new magazine igloos throughout five phases of construction (see **Table 2-2** for details). Demolition of facilities would be deferred where possible and concurrent implementation of phases would occur as required to allow for continued use of their existing munitions storage space until construction of new storage space is complete.

**Table 2-2. Munitions Storage Area Projects and Changes in Impervious Surfaces**

| Construction Phase | Buildings Proposed for Demolition | Facilities Constructed | Construction ($ft^2$) | Demolition ($ft^2$) | Change in Impervious Surface ($ft^2$) |
|---|---|---|---|---|---|
| Phase 1 | 2126 | One storage facility | 2,100 | 2,100 | 0 |
| Phase 2 | 2125, 2127 | Two storage facilities<br>One operations facility | 32,100 | 2,100 | 30,000 |
| Phase 3 | 2110, 2122 | n/a | n/a | 7,100 | -7,100 |
| Phase 4 | 2143 | One storage facility | 10,000 | 5,000 | 5,000 |
| Phase 5 | n/a | Two magazine igloos | 4,200 | n/a | 4,200 |
| **Total** | | | **48,400** | **16,300** | **32,100** |

In Phase 1, Building 2126 would be demolished and a similarly sized 16-bay storage facility would be constructed near the same site to more efficiently store ammunition and explosives. In Phase 2, Buildings 2125 and 2127 would be demolished. A 10,000 $ft^2$ aboveground munitions storage facility would replace Building 2125 and a 2,100 $ft^2$ five-bay storage facility would be constructed west of Building 2143, which would replace Building 2127 and be outside of the floodplain. A new 20,000 $ft^2$ maintenance and inspection facility would also be constructed as part of Phase 2, east of Building 2116. The new facility would centralize conventional maintenance operations associated with Building 2122 and the inspection shop currently in Building 2110. This combined facility would improve maintenance efficiency and improve working conditions of its personnel. The net explosive weight limit of Building 2132 then would be reduced, revising the overall munition storage area's ESQD public traffic route safety arc to avoid East Aderholt Loop. In Phase 3, Buildings 2110 and 2122 would be demolished upon completion of the new maintenance and inspection facility.

Building 2143 would be demolished and replaced with a larger 10,000 $ft^2$ aboveground magazine storage facility under Phase 4. This facility, along with the replacement for Building 2125, would house and centralize all small arms ammunition used for training and contingency operations by flying squadron units and base agencies.

Two new earth-covered magazine igloos would be constructed under Phase 5. Each 2,100 $ft^2$ igloo would increase munitions assets storage by 250,000 pounds net explosive weight, which would include the addition of the 105 mm munitions associated with the AC-130J upgrades. The

magazine design being proposed would provide the highest level of blast resistance and allow for the least restrictive siting separation distances. These two facilities would be sited within the 100-year floodplain which is discussed further in **Section 3.5**.

With the completion of the upgrades, the munitions storage area ESQD public traffic route safety arc would be revised to avoid East Aderholt Loop, a traffic safety waiver would no longer be required, and the storage area would be compliant with explosive safety standards. **Figure 2-7** shows the proposed ESQD arc. The arc extending off the installation would not substantially change. The increase in munitions storage capacity would be sufficient to accommodate the proposed increase in aircraft and training under the Proposed Action.

Under the No Action Alternative, the realignment of aircraft and personnel and increases in munitions associated with the realignment would not occur. The munitions storage area would continue to require safety waivers and use inefficient, outdated, and incompatible facilities. This does not support the purpose of and need for realignment, as described in **Section 1.2**.

**Alternatives Considered but Eliminated from Further Analysis:** No other alternatives were identified that were eliminated from further analysis.

## 2.4 Summary of Proposed Activities

The Proposed Action would involve an end-state increase of approximately 164 personnel, 9 aircraft (4 MC-130 and 5 AC-130 end state), and 2,479 flying hours as a result of the proposed component actions as detailed in **Table 2-3**.

Implementing the component actions described in **Section 2.3** would total approximately 91,400 $ft^2$ of new facilities, site improvements, and new pavements through 2026. There would also be approximately 16,300 $ft^2$ of buildings demolished at Cannon AFB, resulting in a total net increase of 75,100 $ft^2$ of impervious surfaces. **Table 2-4** summarizes the anticipated project areas and changes in impervious surfaces from the component actions under the Proposed Action.

## 2.5 Identification of the Preferred Alternative

The Preferred Alternative is to implement each preferred component alternative as identified in **Section 2.3**.

**Table 2-3. Total Aircraft, Personnel, and Training Increases and End-State through 2026 under the Proposed Action**

| Component | Maximum Additional Interim Aircraft | End-State Additional Aircraft | Maximum Interim Additional Authorized Personnel | End-State Additional Authorized Personnel | Maximum Interim Additional Annual Flying Hours[1] | End-State Additional Annual Flying Hours |
|---|---|---|---|---|---|---|
| 9th SOS | 6 | 4 | 173[2] | 139[2] | 1,657 | 1,104 |
| 12/3/33rd SOS | 0 | 0 | 25 | 25 | 626 | 626 |
| 16th SOS | 5 | 5 | 0 | 0 | 647 | 647 |
| 27th SOSS | 0 | 0[3] | 0 | 0 | 102 | 102 |
| 551st SOS | - | - | 0 | 0 | - | - |
| 27th SOMXS | - | - | 0 | 0 | - | - |
| Total | **11** | **9** | **198** | **164** | **3,032** | **2,479** |

[1] The increase in hours per year is commensurate with the increase in personnel.
[2] Personnel increase number includes additional 72 Aircraft Maintenance Unit personnel as well as flight crews and instructors for the 551st SOS.
[3] CV-22s to be used for water safety training are already stationed at Cannon AFB.

**Table 2-4. Project Area and Change in Impervious Surfaces**

| Component Action | Construction ($ft^2$) | Demolition ($ft^2$) | Change in Impervious Surface ($ft^2$) |
|---|---|---|---|
| 9th SOS | 30,000 | n/a | 30,000 |
| 12th SOS | n/a | n/a | n/a |
| 16th SOS | n/a | n/a | n/a |
| 27th SOSS | n/a | n/a | n/a |
| 551st SOS | 13,000 | n/a | 13,000 |
| 27th SOMXS | 48,400 | 16,300 | 32,100 |
| **Total** | **91,400** | **16,300** | **75,100** |

# 3. Affected Environment and Environmental Consequences

This section describes the environmental resources and conditions most likely to be affected by the Proposed Action and provides information to serve as a baseline from which to identify and evaluate potential environmental and socioeconomic impacts that could result from the Proposed Action. Baseline conditions represent current operational conditions.

This section also discusses the potential environmental impacts of the Proposed Action and alternatives (including the No Action Alternative) on the baseline conditions described in this section and presents criteria for evaluating potential impacts on resource areas for each component action. It presents a detailed analysis of the component actions under the Proposed Action as described in **Section 2.1**. A general analysis of the environmental effects of the No Action Alternative is provided for each resource area.

The specific criteria for evaluating the potential effects of the Proposed Action and alternatives (including the No Action Alternative) are discussed in the following text by resource area. The significance of an action is measured in terms of its context and intensity. The context and intensity of potential effects are described in terms of duration, magnitude, and whether the effects are adverse or beneficial, as summarized below.

***Short- or long-term***. In general, short-term effects are those that would occur only during the time required for construction or for activities lasting less than a few years. Long-term effects are those that are more likely to be persistent and chronic.

***Negligible, minor, moderate, or significant***. These relative terms are used to characterize the magnitude or intensity of an impact. Negligible impacts are generally those that might be perceptible but are at the lower level of detection. A minor effect is slight but detectable. A moderate effect is readily apparent. Significant effects are those that, in their context and because of their magnitude (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR § 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation or the preparation of an EIS to fulfill the policies set forth in NEPA.

***Adverse or beneficial***. An adverse effect is one having unfavorable or undesirable outcomes on the natural or man-made environment. A beneficial effect is one having positive outcomes on the natural or man-made environment.

All potentially relevant resources were initially considered for analysis in this EA. **Sections 3.1** through **3.10** present the existing environmental conditions and potential environmental impacts for the following resource categories: noise, air quality, airspace, infrastructure/transportation, water resources, biological resources, cultural resources, health and safety, hazardous materials and wastes, and socioeconomics.

In compliance with NEPA, CEQ NEPA regulations, and 32 CFR § 989, this section focuses only on the resources considered potentially subject to impacts from the Proposed Action and alternatives and the No Action Alternative. Resource categories that have been eliminated from further detailed study in this document and the rationale for eliminating them are presented as follows.

***Land Use***. The Proposed Action does not include any activities that would be incompatible with existing land uses and land use designations. The Proposed Action consists of increases in aircraft, airspace operations, and personnel and demolition and construction associated with units that are already located at Cannon AFB. The Proposed Action would be compatible with land use guidelines identified in the Cannon AFB Air Installations Compatible Use Zones (AICUZ) program (CAFB 2017a). Facilities are proposed to be constructed within established land uses already containing similar activities and therefore, would not introduce new land uses, conflict with current uses, or change existing land uses. With the exception of facility additions noted in **Section 2**, the proposed associated additional personnel would be accommodated within existing facilities at Cannon AFB that have the capability to support the increased population and currently support similar land uses. Negligible additional land or vacant/open space would be developed and no land use designations require modification. Therefore, impacts on land use are not expected.

***Geological Resources***. The Proposed Action includes limited ground disturbance, which would lead to minimal increases in soil erosion, soil compaction, or changes in soil composition, as discussed under Water Resources. Additionally, the lithology (i.e., the character of a rock formation), stratigraphy (i.e., the layering of sedimentary rocks), and geological structures that control groundwater quality and availability, and distribution of aquifers and confining beds would not be affected. The Proposed Action would not site new facilities in proximity to potential geologic hazards. Therefore, impacts on soils and geology beyond limited ground disturbance are not expected.

***Environmental Justice***. The Proposed Action would occur on existing USAF installations and within existing airspace where similar aircraft currently operate. No environmental justice populations have been identified in the areas of the Proposed Action. Therefore, no impacts, including no disproportionately high and adverse health or environmental effects, on low-income or minority populations would occur.

Where applicable, following the definition of the resource, the affected environment descriptions for the resource areas are broken down by geographic location relevant to the component actions: the vicinity of Cannon AFB and the northeastern New Mexico region.

# 3.1 Noise

## 3.1.1 Definition of Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and

the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as aircraft operations, construction, and vehicular traffic.

Sound consist of vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. "A-weighing," measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their sound levels are provided in **Table 3-1.**

**Table 3-1. Common Sounds and Their Levels**

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

Source: CALTRANS 2013

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

- Maximum Sound Level ($L_{max}$) – $L_{max}$ is the maximum sound level in decibels.
- Equivalent Sound Level ($L_{eq}$) – $L_{eq}$ is the average sound level in decibels of a given event or period of time.
- Sound Exposure Level (SEL) – SEL is a measure of the total energy of an acoustic event. It represents the level of a 1-second long constant sound that would generate the same energy as the actual time-varying noise event such as an aircraft overflight. SEL provides a measure of the net effect of a single acoustic event, but it does not directly represent the sound level at any given time.
- Day-night Average Sound Level (DNL) – DNL is the average sound energy in a 24-hour period with a penalty added to the nighttime levels. Due to the potential to be particularly intrusive, noise events occurring between 10 p.m. and 7 a.m. are assessed a 10 dBA penalty when calculating DNL. DNL is a useful descriptor for aircraft noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. DNL provides a measure of the overall acoustical environment, but as with SEL, it does not directly represent the sound level at any given time. For well-distributed sound, $L_{eq}$ is calculated to be approximately 6.4 dBA lower than DNL.

***Regulatory Review and Land Use Planning***. The Noise Control Act of 1972 (Public Law 92-574) directs federal agencies to comply with applicable federal, state, and local noise control regulations. Neither the State of New Mexico nor Curry County maintains a noise ordinance. The City of Clovis does maintain a nuisance noise ordinance, but it does not contain specific "not-to-exceed" noise levels (City of Clovis Code § 9.40.010).

In 1974, the U.S. Environmental Protection Agency (USEPA) provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. USAF's land use compatibility guidelines for noise exposure are outlined in AFI 32-7063, *Air Installations Compatible Use Zones Program*. **Table 3-2** provides a general overview of recommended noise limits from aircraft operations for land use planning purposes. Detailed guidelines for the compatibility of various land uses with noise exposure levels are included in **Appendix B**.

**Table 3-2. Recommended Noise Limits for Land Use Planning**

| General Level of Noise | Percent Highly Annoyed | Aircraft Noise (DNL) | General Recommended Uses |
|---|---|---|---|
| Low | <15% | < 65 dBA | Noise-sensitive land uses acceptable |
| Moderate | 15–39% | 65–75 dBA | Noise-sensitive land uses normally not recommended |
| High | >39% | > 75 dBA | Noise-sensitive land uses not recommended |

Source: USAF 2015

## 3.1.2 Affected Environment

### 3.1.2.1 CANNON AFB

This section outlines the existing noise environment at Cannon AFB and the surrounding area.

***Background Noise***. Existing sources of noise on and adjacent to the installation include military and civilian aircraft overflights, road traffic, and other noises such as lawn maintenance equipment, construction, and bird and animal vocalizations. Background noise levels ($L_{eq}$ and DNL) without aircraft operations were estimated for the surrounding areas via a desktop analysis using the Table Look Up Method techniques specified in the *American National Standard Institute – Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term Measurements with an Observer Present*. Areas surrounding the installation are primarily rural with estimated average background sound levels of 40 dBA in the daytime, 34 dBA at night, and 42 dBA DNL overall (ANSI 2013).

***Aircraft Noise***. USAF adopted the NOISEMAP computer program to describe noise effects from aircraft operations. NOISEMAP is a suite of computer programs and components developed by USAF to predict noise exposure near an airfield due to aircraft flight, maintenance, and engine run-up operations. NOISEMAP Version 7.3 was used to calculate the existing DNL noise contours at Cannon AFB. NOISEMAP accounts for all aircraft activities, including landings, takeoffs, in-flight operations, maintenance activities, and engine run-ups. The number of flying hours used as a basis for this analysis was presented in **Table 2-3**, and

**Section 3.3.2.1** discusses the baseline flight operations. **Figure 3-1** shows the existing (2016) DNL noise contours plotted in 5 dB increments, ranging from 65 to 85 dBA DNL. The noise contours as shown depict 2016 operational conditions. There have been no substantial changes in operations or mission at the installation since the noise contours were developed; therefore, they have been carried forward as a comparative baseline to determine the level of effects under NEPA. The existing 65 dBA DNL noise contour extends approximately 2 miles from both ends of runway 04/22 and 1.5 miles from both ends of runway 13/31. The 65 dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations.

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

**Table 3-3** presents the existing land acreage exposed to noise levels 65 dBA DNL or greater. Areas exposed to sound levels greater than 65 dBA DNL are predominately within the installation boundary. There are 1,003 acres off Cannon AFB and 1,931 acres on the installation that are within the 65 dBA DNL contour under the existing conditions. There are no schools, churches, or hospitals off the installation within the existing 65 dBA DNL contour. Based on aerial counts, there are approximately 15 residences off the installation within the 65 dBA DNL contour.

**Table 3-3. Area within Noise Contours at Cannon AFB – Existing Conditions**

| Noise Contour (dBA DNL) | Area Under Contours (Acres) | | |
|---|---|---|---|
| | **On-Installation** | **Off-Installation** | **Total** |
| 65-70 | 963 | 917 | 1,880 |
| 70-75 | 601 | 86 | 687 |
| 75-80 | 252 | 0 | 252 |
| 80-85 | 86 | 0 | 86 |
| >85 | 29 | 0 | 29 |
| **Total** | **1,931** | **1,003** | **2,935** |

Source: USAF 2013

### 3.1.2.2 NORTHEASTERN NEW MEXICO REGION

This section outlines the existing noise within and beneath several areas of SUA associated with Cannon AFB squadrons conducting the component actions within the northeastern New Mexico region.

SUAs are areas where military operations are conducted, and access may be restricted on non-participating aircraft. The designation of SUAs identifies where such activity occurs, provides for segregation of that activity from other users, and allows charting to keep airspace users

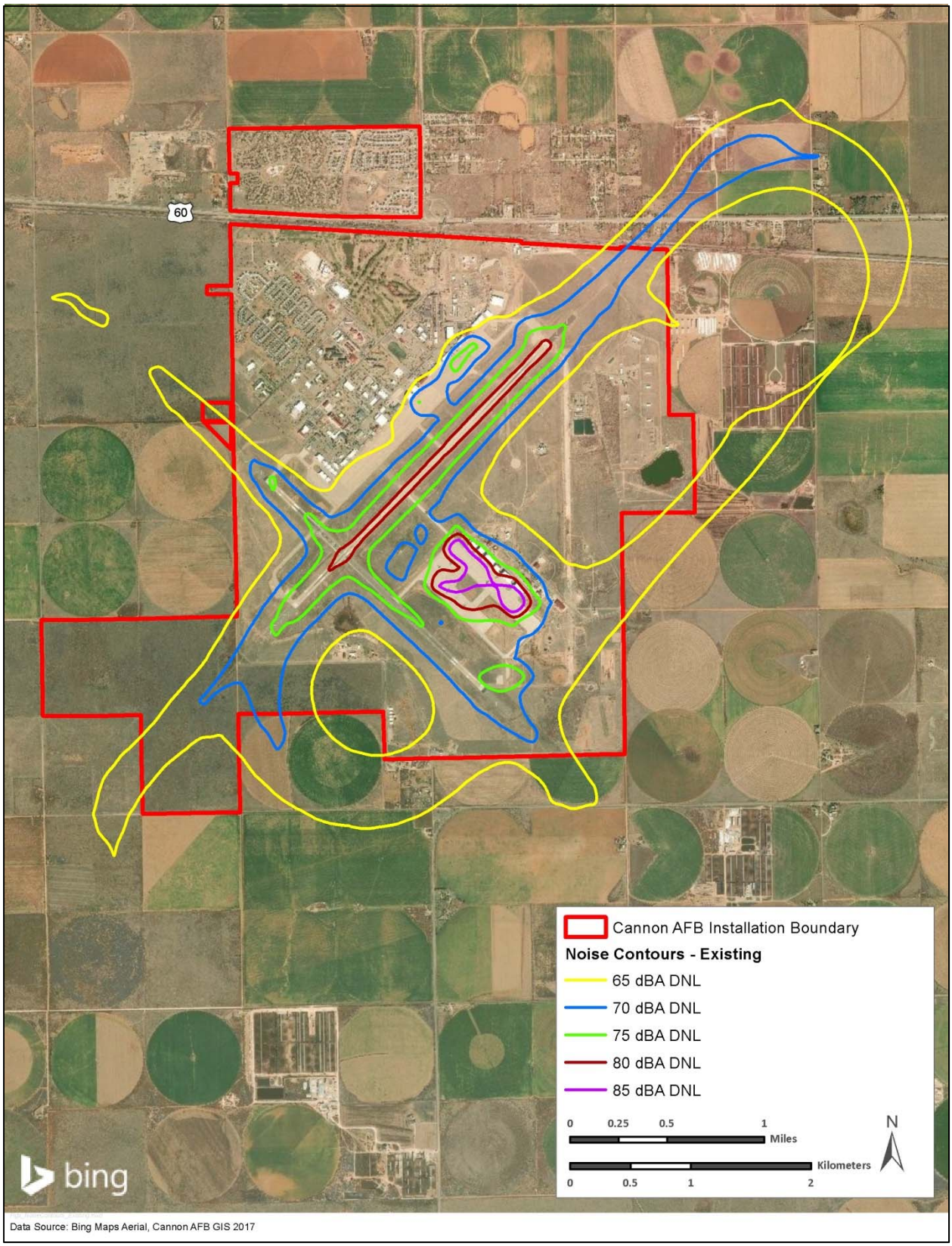



**Figure 3-1. Existing (2016) Cannon AFB Noise Contours**

informed of potential hazards. SUAs near Cannon AFB include restricted airspace and MOAs. **Figure 1-1** depicted and **Table 3-4** outlines nearby SUAs used by Cannon AFB. Existing sources of noise within these SUAs consist of military air operations at a range of altitudes and speeds. Examples of specific flight activities include air combat maneuvering and flights of two or four aircraft (e.g., CV-22 and C-130) flying below 10,000 feet AGL. Although individual overflights within these SUAs can be loud, they are normally infrequent when compared to airspace around active installations and are not concentrated at any single location.

**Table 3-4. Nearby SUAs Used by Cannon AFB**

| Airspace | Floor | Ceiling |
|---|---|---|
| **Restricted Areas** | | |
| R5104A (Melrose Range) | Surface | 18,000 feet above MSL |
| R5105 | Surface | 10,000 feet above MSL |
| **Military Operating Areas** | | |
| Pecos North High MOA | 11,000 feet above MSL | 18,000 feet above MSL |
| Pecos North Low MOA | 500 feet AGL | 10,999 feet above MSL |
| Pecos South MOA | 500 feet AGL | 18,000 feet above MSL |
| Taiban MOA | 500 feet AGL | 10,999 feet above MSL |

MSL = mean sea level, AGL = above ground level
Sources: NGA 2008, NGA 2016

***Restricted Areas (R5104A/R5105 [Melrose Range])***. The areas under R5104A and R5105, and surrounding Melrose Range are characterized by wide-open spaces and low population density. The predominant land use is livestock grazing. Noise levels when military training is not underway are typically low and the sound environment is dominated by natural sounds such as the wind and birds, with occasional anthropogenic sounds such as vehicle traffic. Areas surrounding the range are primarily rural with estimated background sound levels without aircraft or training noise of 40 dBA $L_{eq}$ in the daytime, 34 dBA $L_{eq}$ at night, and 42 dBA DNL overall (ANSI 2013). Widely scattered residences and other structures are in the area.

Wide varieties of air-to-ground and ground-to-ground munitions are currently used at Melrose AFR. A dominant and distinctive noise source is munitions fire from the AC-130W gunship. The gunship fires 30 mm, 40 mm, and 105 mm ammunition while orbiting at a constant bank angle above the impact areas. Heavy artillery noise and aircraft overflights are audible, but distant most of the time in areas surrounding the range, with occasional louder events. The most frequent aircraft used at the range are the C-130 (all models), CV-22, RPA, and non-standard aircraft based at Cannon AFB. Areas beneath R-5104A are currently exposed to approximately 56 dBA DNL, and areas beneath R-5105 are exposed to approximately 58 dBA DNL. Noise complaints about training operations at Melrose Range are infrequent (DOEA 2011).

***MOAs***. Nearby MOAs are used for a wide array of low- to mid-level air operational training. There is no air-to-ground munitions deployment in any nearby MOA, and aircraft activities are less concentrated and higher in altitude in these SUAs when compared to R5104A surrounding Melrose AFR. Noise levels in areas beneath the nearby MOAs are expected to be substantially lower than at the range (i.e., less than 56 dBA DNL), and fully compatible with all underlying land uses (DOEA 2011).

***MTRs.*** In addition to other SUAs, there are numerous nearby MTRs. MTRs are aerial corridors in which military aircraft can operate below 10,000 feet traveling at speeds exceeding 250 knots. IR-109, as was depicted in **Figure 1-1**, is an MTR where some of the component actions would occur. Although individual overflights within these MTRs can be loud, they are infrequent and not concentrated at any single location. There is no air-to-ground munitions deployment in any nearby MTR unless also within the restricted area surrounding Melrose AFR. Aircraft activities are less concentrated along these routes when compared to R5104A surrounding Melrose AFR. Noise levels in areas beneath the nearby MTRs are expected to be substantially lower than at the range (i.e., less than 56 dBA DNL), and fully compatible with all underlying land uses (DOEA 2011).

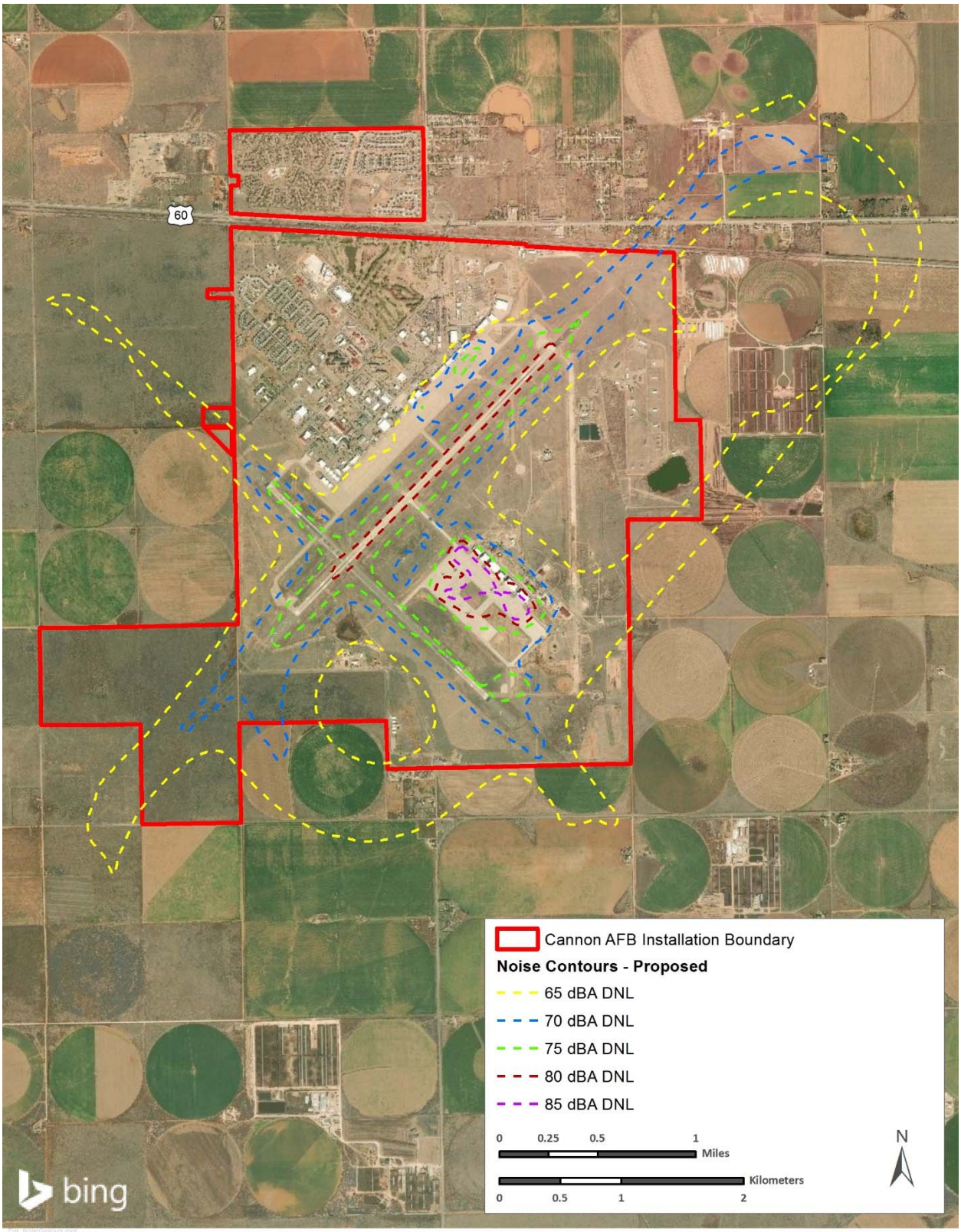
## 3.1.3 Environmental Consequences

This section discusses noise from construction, noise from aircraft, and potential changes to land use compatibility due to implementing the component actions. Changes in noise would be considered significant if they would lead to a violation of any federal, state or local noise ordinance, or substantially increase areas of incompatible land use outside the installation. A discussion of the impacts of noise on wildlife is in **Section 3.6.3**.

### 3.1.3.1 COMPONENT ACTIONS AND ALTERNATIVES

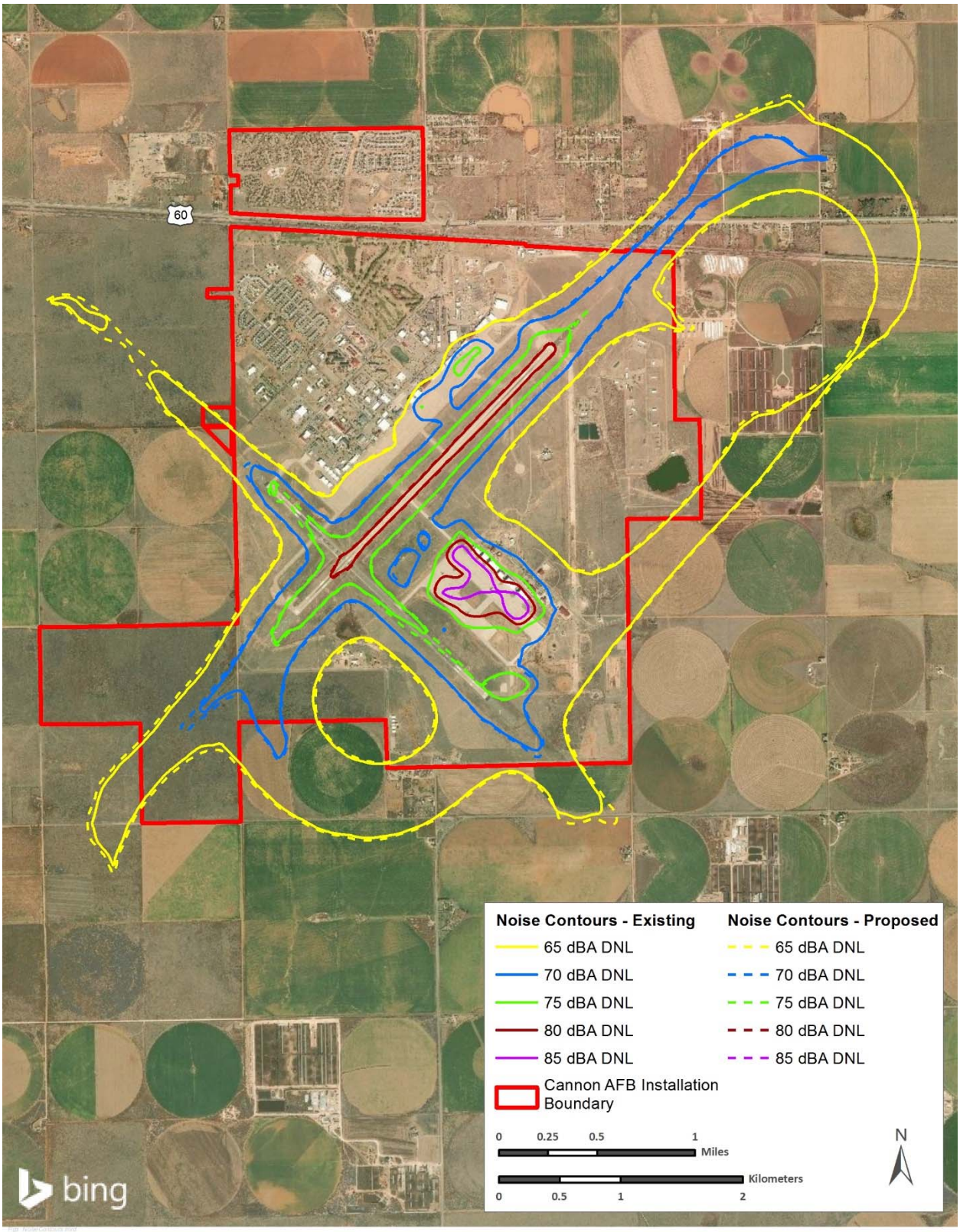
With the implementation of all the component actions, the noise environment in the immediate area surrounding Cannon AFB would continue to be dominated by aircraft operations. This includes changes in the types of aircraft and increases in the number of operations at the installation, including the 9th SOS MC-130J aircraft operations increase, 12th SOS increase in MQ-9 Reaper RPA operations, 16th SOS upgrade of the AC-130W to AC-130J and increase in number of AC-130J aircraft, and the 27th SOSS Water Safety Training. These component actions combined constitute approximately a 10 percent increase in the total air operations at the installation, and a similar increase in flying hours and munitions use during training. In the peak year, there would be a 72 percent increase in 9th SOS MC-130 flight operations (including takeoffs, landings, and closed patterns) from approximately 4,594 to 7,884, and a 42 percent increase in 16th SOS AC-130 flight operations from approximately 5,540 to 7,867. The number of aircraft and operations for all other units would remain unchanged under the Proposed Action when compared to existing conditions.

Noise levels from aircraft training activities on and adjacent to Cannon AFB were calculated using the NOISEMAP 7.3. **Figure 3-2** shows the Proposed Action DNL noise contours on the installation, **Figure 3-3** shows the changes in baseline and Proposed Action DNL noise contours, and **Table 3-5** presents the estimated land acreage exposed to noise levels of 65 dBA DNL or greater. In general, it would take a doubling (100 percent increase) in air operations to have a barely perceptible change to the noise environment (e.g., greater than 3 dBA). Therefore, noise from the 10 percent increase in air operations from all component actions combined would be negligible when compared to existing conditions. These changes would have no perceptible effect on the overall noise in surrounding areas.




Data Source: Bing Maps Aerial, Cannon AFB GIS 2017

**Figure 3-2. Cannon AFB Noise Contours with Component Actions**




Data Source: Bing Maps Aerial, Cannon AFB GIS 2017

**Figure 3-3. Cannon AFB Noise Contours with and without Component Actions**

**Table 3-5. Total Area within Baseline and Proposed Action Noise Contours at Cannon AFB**

| Noise Contour (dBA DNL) | Area Under Contours (acres) | | | | | |
|---|---|---|---|---|---|---|
| | Baseline | | | Proposed Action | | |
| | On-Base | Off-Base | Total | On-Base | Off-Base | Total |
| 65-70 | 963 | 917 | 1,880 | 981 | 1,017 | 1,998 |
| 70-75 | 601 | 86 | 687 | 616 | 99 | 715 |
| 75-80 | 252 | 0 | 252 | 274 | 0 | 274 |
| 80-85 | 86 | 0 | 86 | 93 | 0 | 93 |
| >85 | 29 | 0 | 29 | 29 | 0 | 29 |
| **Total** | **1,931** | **1,003** | **2,935** | **1,993** | **1,116** | **3,109** |

Source: USAF 2013

With all the component actions, the 65 dBA DNL noise contour would continue to extend approximately 2 miles from both ends of runway 04/22 and 1.5 miles from both ends of runway 13/31 and would increase the areas off base exposed to 65 dBA DNL or greater from 1,003 acres to 1,116. The additional 113 acres would not be in any one concentrated location but would constitute an incremental expansion on all sides of the noise contour. These newly exposed areas are primarily undeveloped or agricultural. Changes to the overall noise environment at and surrounding the base would be minute and indistinguishable from existing conditions. There would continue to be no schools, churches, or hospitals off the installation within the 65 dBA DNL contour. Based on aerial counts, there would continue to be approximately 15 residences within the 65 dBA DNL contour. These impacts would be negligible.

There would be a similar increase in the use of and operational tempo within the SUAs, including the restricted areas, MOAs, and MTRs associated with the component actions. The increase in operations in individual areas and along individual routes would range from 10 to 40 percent. Therefore, noise from increases in aircraft operations, combined with noise from component action construction activities, would have no perceptible effect on the overall noise; and noise levels would remain fully compatible with all underlying land uses. Although there would be no perceptible effect on the overall noise environment, there would be a proportional increase in individual fly-over events in these areas and along these routes. Individuals directly under the flight paths of low- to mid-level overflights would experience an incremental increase in brief, and sometimes loud, acoustical events that may interfere with communication and sleep. Aircraft activities are less concentrated in these areas and along these routes when compared to Cannon AFB. Given the limited number and sporadic nature of operations, in these areas and along these routes, these impacts would be minor. Additional review of individual overflights for the component actions is provided below.

$L_{eq}$ 80 dBA is the noise level below which generally there are negligible or lower physical effects on human hearing (USAF 2016a). Implementation of the component actions would not expose off-installation areas to noise levels greater than 80 dBA DNL. Approximately 121 acres on Cannon AFB would be exposed to noise levels of 80 dBA DNL or greater, an increase of 6 acres on the installation when compared to existing conditions. For well-distributed sound, $L_{eq}$ is

approximately 6.4 dBA lower than DNL; therefore, 85-dBA DNL is a conservative surrogate for the 80 dBA $L_{eq}$ threshold for an increased incidence of hypertension. No areas off the installation would be exposed to long-term sound levels greater than 80 dBA. All areas off the installation would be exposed to noise levels well below those required to have any physical effects, including temporary hearing loss. Other than aircraft support structures and hangars, no buildings would be exposed to noise levels of 80 dBA DNL or greater. The occupational hearing program on base would continue to be assessed and managed in accordance with USAF and Occupational Safety and Health Administration (OSHA) regulations regarding occupational noise exposure (USAF 2016b). These effects would be negligible.

In residential areas, long-term exposure to aircraft-induced $L_{eq}$ of 60 dBA has been associated with an increased incidence of hypertension (Kaltenbach 2008). For well-distributed sound, $L_{eq}$ is approximately 6.4 dBA lower than DNL; therefore, 65-dBA DNL is a conservative surrogate for the 60 dBA $L_{eq}$ threshold for an increased incidence of hypertension. The component actions would not expose additional residences to long-term noise levels greater than 60 dBA $L_{eq}$ (i.e., 65 dBA DNL) when compared to existing conditions.

### *9th SOS MC-130J Aircraft Increase*

During the peak year (i.e., 2020) there would be approximately 72 percent more MC-130 air operations conducted by the 9th SOS. This would introduce 289 additional LTOs per year for the 9th SOS, an increase from about 1 LTO per day to about 2 LTOs per day. This would constitute a 4.8 percent increase in the total 5,956 LTOs at Cannon AFB. In general, it would take a 100 percent increase in air operations to have a barely perceptible change to the noise environment. Therefore, the 4.8 percent increase in air operations from the 9th SOS MC-130J would be negligible when compared to existing conditions, and would have no perceptible effect on the overall noise in surrounding areas. Noise from all additional aircraft operations at Cannon AFB, including those from the 9th SOS MC-130J aircraft increase, would generally be indistinguishable from existing conditions as shown in **Figure 3-3**.

There would be a similar increase in the use and operational tempo of the SUAs associated with this component action in northeastern New Mexico. Noise from all additional aircraft operations within these SUAs, including those from the 9th SOS MC-130J, would have no perceptible effect on the overall noise in these areas. However, there would be a proportional increase in individual fly-over events in these areas and along these routes. Individuals directly under the flight paths of low- to mid-level overflights in existing SUAs would experience an incremental increase in brief, and sometimes loud, acoustical events that may temporarily interfere with communication and sleep. The action would not lower the floor or modify existing airspace in any way. In addition, short-term minor adverse impacts would occur from noise associated with construction of the proposed parking lot near the 9th SOS Squadron Operations Facility. Overall noise effects from this component action would be considered minor.

### *12/3/33rd SOS Increase in MQ-9 Reaper RPA Personnel and Training*

Noise associated with the operation of RPAs are comparable to medium-sized trucks or small armored ground vehicles in the field. The maximum sound levels for the MQ-9 are listed in **Table 3-6**. Because of their low levels of noise, they are not commonly accounted for in

**Table 3-6. Maximum Sound Level from MQ-9 Reaper**

| Distance (feet) | Sound Level (dBA) |
|---|---|
| 200 | 85 |
| 500 | 76 |
| 1,000 | 70 |
| 2,000 | 64 |
| 5,000 | 54 |
| 10,000 | 48 |

Source: USAF 1998
Note: Overall sound level during run-up used as a reasonable worst-case for in-flight operations.

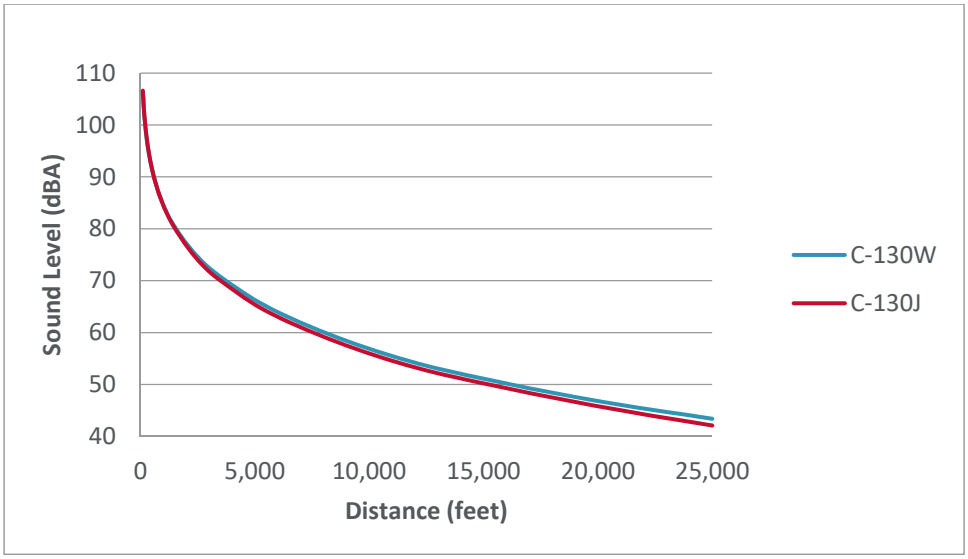
determining the effects of training activity noise on communities and individuals living adjacent to airfields, but they were nonetheless included in preparation of the noise contours.

There would be an estimated 43 percent increase in MQ-9 air operations conducted by the 12th SOS. This would introduce 180 additional LTOs per year for the 12th SOS, an increase from about 1 LTO per day to about 3 LTOs every 2 days. This would constitute a 3.0 percent increase in the total 5,956 LTOs at Cannon AFB. The 3.0 percent increase in RPA operations would translate into negligible (i.e., not distinguishable from existing) change in the overall noise environment. Noise from all additional aircraft operations at Cannon AFB, including those from the 12th SOS RPA, would be indistinguishable from existing conditions as shown in **Figure 3-3**. Individuals directly under the flight paths of low- to mid-level overflights of MQ-9s would experience an incremental increase in brief acoustical events. These events would be distant and audible, but not loud enough to interfere with communication or sleep.

### *16th SOS Upgrade of the AC-130W to AC-130J*

The sound levels from an AC-130J are comparable to but slightly less than that of an AC-130W at all distances (see **Figure 3-4**). However, there would be approximately 42 percent more C-130 air operations conducted by the 16th SOS. This would introduce approximately 274 additional LTOs per year for the 16th SOS, an increase from about 2 LTOs per day to about 3 LTOs per day. This would constitute a 4.6 percent increase in the total 5,956 LTOs at the installation, which would translate into negligible (i.e., not distinguishable from existing) change in the overall noise environment. Noise from all additional aircraft operations at Cannon AFB, including those from the 16th SOS AC-130J, would be indistinguishable from existing conditions as shown in **Figure 3-3**.

Individual AC-130J aircraft are slightly quieter than the AC-130W aircraft that currently operate at Cannon AFB. The AC-130J is noticeably quieter than the AC-130W during approach, but noise during takeoff is similar for the two aircraft (USAF 2018, USAF 2013). Aircrews operating the AC-130J aircraft would use similar flight procedures to those used by the AC-130W aircrews. Approximately 25 percent of takeoffs and 40 percent of landings would be tactical operations specifically designed to reduce the risk of ground-based threats to the aircraft. AC-130J aircrews, similar to the existing AC-130W aircrews, would conduct about 10 percent of their operations between 10 p.m. and 7 a.m. Depending on the aircraft's altitude and timing, individual overflights can interfere with communication, disrupt sleep, and intermittently annoy




Source: USAF 2018

**Figure 3-4. Comparison of Noise from AC-130 Aircraft**

individuals. With the conversion to the AC-130J, there would be no readily perceptible increase in these events (i.e., noise disturbance) when compared to current conditions. As with existing conditions, overflights would annoy some nearby individuals from time to time; however, the overall noise environment would be comparable to the existing AC-130W mission at the base. These effects would be negligible.

There would be a similar increase in the use and operational tempo of the SUAs associated with this component action in northeastern New Mexico, including the restricted areas, MOAs, and MTRs. Noise from all additional aircraft operations within these SUAs, including those from the 16th SOS AC-130J, would have no perceptible effect on the overall noise in these areas. However, there would be a proportional increase in individual fly-over events in these areas and along these routes. Individuals directly under the flight paths of low- to mid-level overflights would experience an incremental increase in brief, and sometimes loud, acoustical events that may temporarily interfere with communication and sleep. These effects would be considered minor.

### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* There would be approximately 24 additional LTOs per year for the 27th SOSS to operate CV-22 aircraft to Ute Reservoir, an overall installation-wide increase of about two LTOs per month. This would constitute a 0.4 percent increase in the total 5,956 LTOs at the installation and would have no perceptible effect on the overall noise in areas surrounding the installation. Noise at Cannon AFB from all additional aircraft operations, including those from the 27th SOSS, would be indistinguishable from existing conditions as shown in **Figure 3-3**.

Normally, only one CV-22 at a time would be used for water safety training, but two may be used on occasion. **Table 3-7** outlines the estimated sound levels (both SEL and $L_{max}$) for

**Table 3-7. Sound Levels for Double-Formation CV-22 Overflights In Transit Mode**

| Altitude (feet AGL) | SEL (dBA) | $L_{max}$ (dBA) | Percentage Highly Annoyed |
|---|---|---|---|
| 500 | 88.0 | 82.1 | 23% |
| 1,000 | 84.1 | 75.3 | 14% |
| 2,000 | 79.9 | 68.4 | 4% |

Source: USAF 2018, Rylander 1974, Rylander 1988

double-formation CV-22 overflights in transit to and from the lake, and a single CV-22 would be approximately 3 dBA less than the levels shown. The $L_{max}$ of two CV-22s at 500 feet AGL would be 82.1 dBA while in transit. This level is comparable to sound from a kitchen garbage disposal as indicated in **Table 3-1**. The maximum noise level would only be experienced briefly at the closest point of approach with noise levels rising and falling as the aircraft flew over. CV-22 fly at speeds that make their presence audible from a distance and individuals would be aware of their approach and experience little startle effect.

The SEL of two CV-22s at 500 feet AGL is 88.0 dBA. If there is only one flight per day, the DNL equivalent is 49.4 dBA less than the SEL. So, a double-formation CV-22 flyover at 500 feet (88 dB SEL) is equivalent to 38.6 dBA DNL. DNL would increase 3 dBA for every doubling of operations, so it would take 274 CV-22 flights occurring over one location within a 24-hour period to achieve 65 dBA DNL. Because there would be so few aircraft overflights to and from the reservoir, the overall average sound levels (DNL) would be comparable to existing conditions, and never exceed 65 dBA DNL. These impacts would be considered negligible.

Although operational levels would be too low to generate incompatible land uses under flight paths or at the reservoir, noise from individual CV-22 overflights would generate distinct acoustical events and have the potential from time to time to annoy individuals directly under their flight path. A good predictor of annoyance near individual overflights is the maximum sound level. The maximum sound levels and annoyance levels for the CV-22 are listed in **Table 3-7**. In general, two CV-22s flying at 500 feet AGL would highly annoy approximately 23 percent of individuals directly under their flight path. Given the limited number, low noise levels, and sporadic nature of operations, these impacts would be minor.

CV-22s would conduct up to 24 water training exercises per year at the reservoir. **Table 3-8** outlines the estimated sound levels (SEL and $L_{max}$) for double-formation CV-22 overflights at Ute Reservoir. The SEL of two CV-22s hovering at 200 feet AGL would be 104.1 dBA, and the DNL would be 49.4 dBA less than the SEL or 54.7 dBA DNL. DNL would increase 3 dBA for every doubling of operations, so it would take 11 CV-22 flights occurring within a 24-hour period to achieve 65 dBA DNL. Based upon the limited number of aircraft operations at the reservoir the overall sound levels would never exceed 65 dBA DNL at any nearby sensitive areas.

Aircraft noise and water blowback in the immediately proximal water area would be expected from the periods of low hover (between 10 and 100 feet AGL) flight above the water surface. Because the 30-minute hover flight would be conducted in the central portion of the reservoir, away from obstructions and populated areas during the night hours of the weekdays reported to

**Table 3-8. Sound Levels for Double-Formation CV-22 Overflights In Helicopter Mode**

| Altitude (feet AGL) | SEL (dBA) | | $L_{max}$ (dBA) | | DNL (dBA) (single operation per day) | |
|---|---|---|---|---|---|---|
| | **Approach** | **Hover** | **Approach** | **Hover** | **Approach** | **Hover** |
| 200 | 101.9 | 104.1 | 98.7 | 95.4 | 52.5 | 54.7 |
| 500 | 95.5 | 95.8 | 88.7 | 86.7 | 46.1 | 46.4 |
| 1,000 | 91.8 | 89.3 | 83.2 | 80.0 | 42.4 | 39.9 |
| 2,000 | 87.6 | 82.3 | 76.2 | 73.0 | 38.2 | 32.9 |

Source: USAF 2018

have the lowest rates of visitation, the physical presence of the aircraft and aircraft noise impacts on recreational activities and potential for conflicting uses of the area would be minimized. Because the operations would require flight over the reservoir for a maximum period of 30 minutes per training scenario, any aircraft noise impacts would be short term and minor.

*Conchas Lake Alternative.* Impacts from noise at Conchas Lake would be generally similar to those described for Ute Reservoir. As with Ute Reservoir (Preferred Alternative) and for similar reasons, noise at Cannon AFB from all additional aircraft operations, including those from the 27th SOSS, would be indistinguishable from existing conditions as shown in **Figure 3-3**. Additionally, because there would be so few aircraft overflights to and from Conchase Lake, the overall average sound levels (DNL) would be comparable to existing conditions, and never exceed 65 dBA DNL. Although operational levels would be too low to generate incompatible land uses under flight paths or at the lake, noise from individual CV-22 hovers would generate distinct acoustical events and have the potential from time-to-time to annoy individuals directly under their training operation. These impacts would be temporary and minor.

### *551st SOS Expansion of Flight Simulators*

The 551st SOS Expansion of Flight Simulators component action would include noise from construction activities. This component action would not include changes in aircraft operations or training; therefore, there would be no changes in the existing noise environment associated with these sources.

Demolition and construction at Building 724 would require the use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3-9** presents typical noise levels (dBA at 50 feet) for the main phases of outdoor construction. Individual pieces of heavy equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (USEPA 1971). With multiple items of equipment operating concurrently, noise levels can be high within several hundred feet of active construction sites.

All demolition and construction would be within the installation's property boundary, collocated with other existing noise-compatible activities, and end with the construction phase. These

activities would be conducted in the context of an active military installation where aircraft and other types of noise are typical. Given the temporary nature of proposed construction and the existing noise environment, these effects would be minor. Although construction-related noise effects would be minor, the following best management practices (BMPs) would be performed to reduce any realized noise impacts:

**Table 3-9. Noise Levels Associated with Outdoor Construction**

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

Sources: USEPA 1971, FHWA 2006

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

*Building 4675 Expansion Alternative.* Noise impacts for the Building 4675 Expansion Alternative would be similar to those described for Building 724.

#### *27th SOMXS Munitions Storage Area Upgrades*

As with the 551st SOS component action, the 27th SOMXS Munitions Storage Area Upgrades action would include noise due to demolition and construction. Similarly, this component action would not include changes in aircraft operations or training; therefore, there would be no changes in the existing noise environment associated with these sources.

The nature and overall level of effects from construction would be similar to those outlined for the 551st SOS action but would take place near the munitions storage area. All construction would be within the installation's property boundary, collocated with other existing noise-compatible activities, and end with the construction phase. These activities would be conducted in the context of an active military installation where aircraft and other types of noise are typical. Given the temporary nature of proposed construction activities and the existing noise environment, these effects would be minor. BMPs similar to those outlined under the 551st SOS action would be implemented.

### 3.1.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

The component actions collectively would have short-term minor and long-term negligible to minor adverse effects on the noise environment. Short-term effects would be due to noise generated by heavy equipment during demolition and construction associated with the 551st SOS Expansion of Flight Simulators and the 27th SOMXS Munitions Storage Area Upgrades. Long-term effects would be due to incremental increases in aircraft noise in areas surrounding

Cannon AFB associated with the 9th SOS MC-130J Aircraft Increase, 12th SOS Increase in RPA Personnel, 16th SOS Upgrade of the AC-130W to AC-130J, and 27th SOSS Water Safety Training Upgrade. The component actions would not lead to a violation of any federal, state or local noise ordinance, and would not substantially increase areas of incompatible land use on and adjacent to Cannon AFB.

#### 3.1.3.3 NO ACTION ALTERNATIVE

Selecting the No Action Alternative would result in no effect on the current noise environment. No construction would be undertaken, and there would be no changes in aircraft operations. Noise conditions would remain unchanged when compared to existing conditions.

## 3.2 Air Quality

### 3.2.1 Definition of Resource

Air pollution is the presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration such as to be injurious to human, plant, or animal life, or to interfere unreasonably with the comfortable enjoyment of life and property. Air quality as a resource incorporates several constituents that describe the level of overall air pollution within a region, sources of air emissions, and regulations governing air emissions. The following subsections include a discussion of the existing conditions, a regulatory overview, and a summary of greenhouse gases and global warming.

### 3.2.2 Affected Environment

#### 3.2.2.1 CANNON AFB

USEPA Region 6 and the New Mexico Environment Department (NMED) regulate air quality in New Mexico. The Clean Air Act (CAA) (42 USC § 7401–7671q), as amended, assigns USEPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR § 50) that specify acceptable concentration levels of six criteria pollutants: particulate matter (measured as particulate matter less than or equal to 10 microns in diameter [$PM_{10}$] and less than or equal to 2.5 microns in diameter [$PM_{2.5}$]); sulfur dioxide ($SO_2$); carbon monoxide (CO); nitrogen dioxide ($NO_2$); ozone ($O_3$), which is formed from volatile organic compounds (VOCs) and nitrogen oxides ($NO_x$) emissions; and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. Each state has the authority to adopt standards stricter than those established under the federal program. The State of New Mexico has state standards slightly stricter than the federal standards.

Federal regulations designate Air Quality Control Regions (AQCRs) or portions of ACQRs in violation of the NAAQS as nonattainment areas, and AQCRs with levels below the NAAQS as attainment areas. Cannon AFB is within Curry County, which is within the Pecos-Permian Basin Interstate AQCR (40 CFR § 81.242). USEPA has designated Curry County as in attainment for all criteria pollutants (USEPA 2018a). USEPA monitors levels of criteria pollutants at

representative sites in each region throughout New Mexico. For reference purposes, **Table 3-10** shows the monitored concentrations of criteria pollutants at the worst case monitoring location within the AQCR.

***Permitting.*** NMED oversees programs for permitting the operation of new or modified stationary source air emissions in New Mexico. Air permitting is required for many industries and facilities that emit regulated pollutants. Based on the size of the emissions units and type of

**Table 3-10. Air Quality Standards and Monitored Data in the Pecos-Permian Basin Interstate AQCR**

| Pollutant | NAAQS | | Monitored Concentrations | | |
|---|---|---|---|---|---|
| | **Level** | **Averaging Period** | **2015** | **2016** | **2017** |
| ***$NO_2$*** | | | | | |
| 1-hour (ppb) | 100 | 98$^{th}$ percentile, averaged over 3 years | 20 | 33 | 32 |
| ***$O_3$*** | | | | | |
| 8-hour (ppm) | 0.070 | 3-year average of the fourth highest daily maximum | 0.067 | 0.065 | 0.076 |
| ***$PM_{2.5}$*** | | | | | |
| 24-hour (µg/m$^3$) | 35 | 98$^{th}$ percentile, averaged over 3 years | - | 12 | - |
| Annual mean (µg/m$^3$) | 12 | Averaged over 3 years | - | 5.9 | - |

Note: Pollutants not shown in this table are not considered criteria pollutants of concern and not monitored in the Pecos-Permian Basin Interstate AQCR.
Source: 40 CFR § 50.1-50.12, USEPA 2018b.
ppb = parts per billion; ppm = parts per million; µg/m$^3$ = micrograms per cubic meter

pollutants emitted, the state sets permit rules and standards for emissions sources. Cannon AFB is a major source of air emissions and holds a Title V air operating permit (NMED Permit #P119). The permit requirements include annual inventory of all significant stationary sources of air emissions for each of the criteria pollutants of concern, and monitoring and recordkeeping requirements. Primary stationary sources of air emissions include paint booths, fuel storage areas, aircraft engine test stands, and back-up generators. **Table 3-11** lists Cannon AFB's 2017 facility-wide air emissions from all significant stationary sources. NMED, like most states, does not require permitting of mobile source emissions (e.g., aircraft and vehicle operations).

**Table 3-11. Annual Emissions for Significant Stationary Sources at Cannon AFB**

| Pollutant | Emissions (tons/year) |
|---|---|
| CO | 73.1 |
| $NO_x$ | 134.6 |
| VOCs | 97.5 |
| $PM_{10}/PM_{2.5}$ | 7.6 |
| $SO_2$ | 9.5 |

Source: NMED 2018.

***Climate and Greenhouse Gases***. Ongoing climate change makes it pertinent for DoD to evaluate climate-change risks and vulnerabilities, and to manage the short- and long-term effects of climate change on their operations and mission. DoD has committed to reducing

greenhouse gas (GHG) emissions from non-combat activities by 34 percent from the FY 2008 baseline by 2020 (DoD 2016).

Historically, Clovis, New Mexico's average high temperature is 91.0 degrees Fahrenheit (°F) in the hottest month of July, and the average low temperature is 25.0°F in the coldest month of January. Clovis has an average annual precipitation of 18.5 inches per year. The wettest month of the year is July with an average rainfall of 3.4 inches (Idcide 2018).

#### 3.2.2.2 NORTHEASTERN NEW MEXICO REGION

All other areas associated with the component actions and alternatives are within the Pecos-Permian Basin Interstate AQCR (40 CFR § 81.242) or the Northeastern Plains Intrastate Air Quality Control Region (40 CFR § 81.240). As with Curry County, USEPA has designated all counties associated with the component actions as in attainment for all criteria pollutants (USEPA 2018a). Microclimates within the region vary, but the general weather is comparable to that of Clovis as outlined above.

### 3.2.3 Environmental Consequences

Impacts on air quality would be considered significant if the total emissions would exceed the General Conformity Rule *de minimis* (of minimal importance) threshold values, or the component actions would contribute to a violation of any federal, state, or local air regulation. Because the area within and around Cannon AFB is in attainment for the NAAQS, the General Conformity Rule doesn't apply. The *de minimis* thresholds have been utilized as a surrogate to determine the level of impacts under NEPA.

#### 3.2.3.1 COMPONENT ACTIONS AND ALTERNATIVES

Air quality has been assessed on a regional scale, and all component actions were treated as the single Proposed Action to assess their impacts. The component actions would occur within a region USEPA has designated as an attainment area for the NAAQS; therefore, the General Conformity Rule does not apply. The General Conformity Rule was established with NEPA in mind, and it is understood that actions of this size within a USEPA-designated attainment area would have less than significant impacts on air quality. Although the General Conformity Rule would not apply, USAF's Air Conformity Applicability Model (ACAM) was used to estimate the total direct and indirect emissions from all the component actions, which have been compared to the *de minimis* thresholds to determine the level of effects under NEPA (USAF 2019).

**Table 3-12** lists total direct and indirect annual air emissions resulting from all the component actions. Demolition and construction emissions were estimated for fugitive dust, on- and off-road diesel equipment and vehicles, worker trips, architectural coatings, and paving off-gasses. Operational emissions were estimated for changes in aircraft operations, heated space, and personnel. Total combined emissions would be below the *de minimis* threshold of 100 tons per year (tpy) of each pollutant in all areas; therefore, the level of impacts would be minor. Moderate changes in facilities siting or size, or aircraft operations would not substantially change these emissions estimates, and would not change the level of effects under NEPA. The ACAM report and a Record of Non-Applicability for the General Conformity Rule is provided in **Appendix C**.

**Table 3-12. Annual Air Emissions Compared to *De Minimis* Thresholds**

| | CO | $NO_x$ | VOC | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | De minimis Threshold [tpy] | Exceeds De Minimis Thresholds? [Yes/No] |
|---|---|---|---|---|---|---|---|---|
| Construction and Demolition | 7.3 | 7.6 | 1.8 | <0.1 | 3.3 | 0.4 | 100 | No |
| Operations | 46.9 | 39.5 | 25.6 | 3.0 | 2.5 | 2.2 | | |

Source: USAF 2019.

Any new stationary sources of air emissions would fully comply with NMED permitting requirements. The New Mexico Administrative Code (NMAC) outlines other non-permitting requirements such as controlling fugitive dust and open burning. All persons responsible for any operation, process, handling, transportation, or storage facility that could result in fugitive dust would take reasonable precautions to prevent such dust from becoming airborne. Reasonable precautions might include using water to control dust from road grading or land clearing.

The component actions would proceed in full compliance with current NMAC requirements with compliant practices and products. These requirements include the following:

- smoke and visible emissions (NMAC 20-2.61)
- open burning (NMAC 20-2.60)
- emissions from gas burning equipment (NMAC 20-2.33)
- emissions from oil burning equipment (NMAC 20-2.34).

This listing is not all-inclusive; USAF and any contractors would comply with all applicable air pollution control regulations.

***Greenhouse Gases and Climate Change***. This EA examines GHGs as a category of air emissions. It also looks at issues of temperature and precipitation trends to determine whether the affected environment or component actions would be affected by climate change. This EA does not attempt to measure the actual incremental impacts of GHG emissions from the component actions. There is a lack of consensus on how to measure such impacts. Existing climate models have substantial variation in output and do not have the ability to measure the actual incremental impacts of a project on the environment. There are also no established criteria identifying monetized values that are to be considered significant for NEPA purposes.

New Mexico is in the southwest climate region of the United States, where climate change is expected to contribute to declining water supplies, reduced agricultural yields, health impacts in cities due to heat, and flooding and erosion in coastal areas. In addition, increased heat, drought, and insect outbreaks are expected to increase wildfires throughout the region. Annual average temperatures are projected to rise by 5.5°F by 2041 and by 9.5°F by 2099, with the greatest increases in the summer and fall. Summertime heat waves are projected to become longer and hotter, whereas the number of wintertime cold air outbreaks will decrease (NCA 2014).

These changes affect public health through increased risk of heat stress, and infrastructure through increased risk of disruptions to electric power generation. Design and mitigation in construction projects for reducing escalating effects include (1) use of white roofs, shade tree planting, and increased shading; (2) reduction of non-air conditioning demand through use of energy star appliances and systems; (3) application of smart grid technologies and addition of solar power generation for summer peak demand; and (4) increased preparedness through provision of cooling centers and programs to check on at-risk-populations. This list is not all inclusive, but it is anticipated that the ultimate siting and design of facilities or infrastructure would naturally incorporate resiliency measures and systematically avoid effects of climate change by siting reuse away from areas that might be affected. For example, if there were more flash floods in the area, facilities and infrastructure would not be built in or adjacent to streambeds.

**Table 3-13** compares the estimated GHG emissions from all the component actions combined with global, national, and state GHG emissions. The estimated increase would be small, and the impact would be negligible.

**Table 3-13. Global, Countrywide, and Statewide GHG Emissions**

| Scale | $CO_2e$ Emissions (MMT) | Change from the Component Actions |
|---|---|---|
| Global | 43,125 | 0.00002 percent |
| United States | 6,870 | 0.0001 percent |
| New Mexico | 59 | 0.016 percent |
| All Component Actions Combined | 0.0098 | - |

Sources: USEIA 2014, USAF 2019
Note: MMT = million metric tons, $CO_2e$ = carbon dioxide equivalent.

**Table 3-14** outlines potential climate stressors and their effects on the component actions. The training activities at and around Cannon AFB in and of themselves are only indirectly dependent on any of the elements associated with future climate scenarios (e.g., meteorological changes). At this time, no future climate scenario or potential climate stressor would have appreciable effects on any element of the component actions.

**Table 3-14. Effects of Potential Climate Stressors**

| Potential Climate Stressor | Effects on the Component Actions |
|---|---|
| More frequent and intense heat waves | Negligible |
| Longer fire seasons and more severe wildfires | Negligible |
| Changes in precipitation patterns | Negligible |
| Increased drought | Negligible |
| Harm to water resources, agriculture, wildlife, ecosystems | Negligible |

### 3.2.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

All the component actions combined would have short- and long-term minor adverse impacts on air quality. Short-term impacts would be from fugitive dust and the use of heavy equipment

during construction and demolition activities. Long-term impacts would be due to an increase in the number of personnel, heated space, and additional air operations at and near the installation. Total combined emissions would not exceed the General Conformity Rule *de minimis* threshold values, and the component actions would not contribute to a violation of any federal, state, or local air regulation.

#### 3.2.3.3 NO ACTION ALTERNATIVE

No new impacts on air quality would be expected under the No Action Alternative. There would be no short-term changes to emissions from construction and demolition or long-term changes in aircraft operations or personnel. Ambient air quality would remain unchanged when compared to existing conditions.

## 3.3 Airspace

### 3.3.1 Definition of Resource

Airspace management is defined by USAF as the coordination, integration, and regulation of the use of airspace. The objective of airspace management is to meet military training requirements through the safe and efficient use of available navigable airspace in a peacetime environment while minimizing the impact on other aviation users and the public (AFI 13-201, *Air Force Airspace Management*). Airspace management procedures assist in preventing potential conflicts or aircraft accidents associated with aircraft using designated airspace in the U.S., including restricted military airspace.

The management of airspace is governed by federal legislation and military regulations and procedures. The Federal Aviation Administration (FAA) has overall responsibility for managing airspace through a system of flight rules and regulations, airspace management actions, and air traffic control (ATC) procedures. FAA accomplishes this through close coordination with state aviation and airport planners, military airspace managers, and other entities to determine how airspace can be used most effectively to serve all interests. The FAA *Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures* defines and provides the operational requirements for each of the various types or classes of airspace (FAA 2017). The airspace environment is described in terms of its principal attributes, namely controlled and uncontrolled airspace and SUA.

***Controlled Airspace***. Controlled airspace is a generic term that encompasses the different classifications (Class A, B, C, D, E and G) of airspace and defines dimensions within which ATC service is provided to flights under instrument meteorological conditions and visual meteorological conditions. General descriptions of airspace classifications applicable to Cannon AFB and its airspace follow. All military and civilian aircraft utilize complimentary Aviation Regulations.

> ***Class A airspace*** is generally airspace from an altitude of 18,000 feet above mean sea level (MSL) up to and including an altitude of 60,000 feet above MSL.

***Class B airspace*** is generally airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of Instrument Flight Rules (IFR) operations or passenger handling. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace.

***Class C airspace*** is generally airspace from the surface to 4,000 feet above the airport elevation surrounding those airports that have an operational control tower, are services by a radar approach control, and have acertain number of IFR operations or passenger handling.

***Class D airspace*** is generally airspace from the ground surface to an attitude of 2,500 feet above the airport elevation (charted in MSL) surrounding an operating ATC-controlled airport.

***Class E airspace*** can be described as general controlled airspace. Class E airspace can range from the ground surface at non-towered airfields up to an altitude of 18,000 feet above MSL. Most Class E airspace is designed to provide separation for participating IFR aircraft where more stringent airspace control has not been established.

***Uncontrolled Airspace***. Uncontrolled (i.e., Class G) airspace is the portion of airspace that has not been designated as Class A, B, C, D, or E airspace and is, therefore, not subject to restrictions that apply to controlled airspace. ATC does not have the authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are operating under visual meteorological conditions.

***Federal Airways***. Three strata of federal airways provide standard flight routes for most aircraft operating in the National Airspace System (NAS) including Victor Routes (indicated with "V" designator), Jet Routes (indicated with "J" designator), and airspace above the Jet Routes. The first stratum includes Victor Routes, or straight-line, low altitude routes between either two very high frequency omnidirectional range (VOR) stations, or between a VOR and a VOR intersection. These routes are 8 nautical miles wide and typically extend between 1,200 feet AGL and 18,000 feet MSL. The second stratum includes Jet Routes that exist between 18,000 feet MSL and 45,000 feet MSL. The third strata includes airspace greater than 45,000 feet MSL.

***Special Use Airspace***. SUA consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. SUAs were established, in a coordinated effort with FAA, to maintain safety by separating military and civilian flights. SUA usually consists of prohibited areas, restricted airspace (noted with R designator), MOAs, and controlled firing areas. With the exception of controlled firing areas, SUA is depicted on aeronautical charts. Chart depictions include hours of operation, altitudes, and the agency controlling the airspace. All SUA descriptions are contained in FAA Joint Order (JO) 7400.8 series, *Special Use Airspace*. FAA JO 7400.2, *Procedures for Handling Airspace Matters*, is a basic document that defines procedures for handling airspace matters including SUA. Military missions may also use other types of airspace (designated as airspace for special use) that is not categorized as SUA but where limitations may still be imposed on

nonparticipating aircraft. This type of airspace is slightly less restrictive than SUA, but its purpose is also to minimize negative interactions between a military mission and nonparticipating aircraft. Examples of airspace for special use include MTRs, visual flight routes (VRs), instrument flight routes (IRs), and slow routes (SRs). Descriptions of applicable airspace types follow.

***Restricted Area Airspace.*** Restricted Area airspace is a block of airspace reserved for military operations that cannot be entered by private or commercial aircraft without permission from the controlling agency when that airspace is active.

***MOAs.*** An MOA is a block of airspace established outside of Class A airspace where there may be a high density of military aircraft conducting nonhazardous operations (including low level flights and flights in excess of 250 knots [287 miles per hour]). Private and commercial aircraft may also use this airspace. The purpose of the MOA is to separate military activities from IFR traffic and to identify Visual Flight Rules (VFR) traffic where these activities are conducted. Coordination and safety protocols are followed for entry into and exit out of the MOAs to ensure awareness of aircraft operating within the airspaces.

***MTRs.*** MTRs are military air traffic corridors designated by FAA Special Use Airspace JO 7400.8 for low altitude military operations at airspeeds in excess of 250 knots. MTRs provide airspace for military aircraft to practice navigational skills over a variety of terrain and provide the military with access to drop zones (DZs), ranges, and other destinations. The centerlines of MTRs are depicted on aeronautical charts. Typically, MTRs are routes that require pilots to follow in accordance with the FAA's VFRs or IFRs (FAA 2017; AFI 11-202 Volume 3 with the AFSOC Supplement, *Flying Operations General Flight Rules).* The minimum weather conditions for ceiling and visibility for VFR flights are defined in Federal Aviation Regulation Part 91 Section 91.155, *Basic VFR Weather Minimums*, and vary depending on the type of airspace in which the aircraft is operating, and on whether the flight is conducted during daytime or nighttime. Typical daytime VFR minimums for most airspace is 3 statute miles of flight visibility and a distance from clouds of 500 feet below, 1,000 feet above, and 2,000 feet horizontally.

***VRs.*** VRs are flight routes that can be used wherein the pilot must be able to operate the aircraft with visual reference to the ground, and by visually avoiding obstructions and other aircraft. The use of these routes is clear-weather dependent, as specified by FAA Special Use Airspace JO 7400.8.

***IRs.*** IRs must be used when the operation of an aircraft under VFR is not safe. Flight depends upon flying by reference to instruments in the aircraft, and navigation is accomplished by reference to electronic signals and communication. Typically, use of IRs is mandatory during any weather condition that is less than the specified VFR minimum but wherein the aircraft can still be operated safely.

***SRs.*** SRs are flight routes established by the DoD to support low altitude and slow-speed flight training requirements. The distance and dimensions of SRs are defined in

the *Department of Defense Area Planning (AP)/1B: Military Training Routes in North and South America* (hereafter DoD AP/1B). Flight operations conducted in SRs follow visual flight rules below an altitude of 1,500 feet and at a speed of 250 knots or less.

***Aircraft Safety***. Aircraft safety is based on the physical risks associated with aircraft flight and current military operation procedures concerning aircraft safety. Generally, civilian aircraft fly in accordance with Federal Aviation Regulations Part 91, *General Operating and Flight Rules*, which governs such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. This regulation has precise requirements for the use of airports, heliports, and other landing areas; local flying rules; and SUA. DoD aircraft operate in accordance with operating rules developed by and for each of the military services. USAF operates in accordance with AFI 11-202.

Obstructions to flights, which include towers and power transmission lines, represent safety concerns for aircrews, especially those engaged in low altitude flight training. Hazardous weather conditions can pose safety hazards and influence a pilot to alter flight. Pilots consult the National Weather Service or weather services at local airports to obtain preflight weather information. Adverse weather conditions of concern include tornadoes, thunderstorms, hail, severe turbulence, dust storms, and wind shear. The evaluation of potential hazards of weather conditions rests in a pilot's sound discretion based on knowledge of available information, experience, and the operational limits of the aircraft.

USAF uses FAA JO 7110.65, *Air Traffic Control*, and FAA JO 7610.4, *Memorandum of Agreement between Department of the Air Force and Federal Aviation Administration on Safety for Space Transportation and Range Activities*, which establish procedures for flying, airfield, and flight-line vehicle operations at USAF airfields. AFI 91-202, *The US Air Force Mishap Prevention Program*, implements Air Force Policy Directive 91-2, *Safety Programs*.

For safety and to ensure that flight operations are scheduled to avoid interference with other aircraft in the area, pilots coordinate with the appropriate Air Route Traffic Control Center (ARTCC). Entry and exit of MOAs are coordinated with the appropriate ARTCCs to ensure awareness of flight operations within the area.

### 3.3.2 Affected Environment

***Airspaces***. Class D airspace extends in a 6-nautical mile radius around Cannon AFB's airfield from the surface to 6,800 feet MSL (AFSOC 2014). Control of additional airspace has been delegated to Cannon Radar Approach Control over and around the Class D airspace extending to 17,000 feet MSL. This provides the ability to monitor and control military and civilian air traffic around Cannon AFB. The airspace between the Class D airspace and Melrose AFR is classified as Class E and includes a Class E Corridor for RPA transitions from Cannon AFB Class D airspace to restricted airspace (R-5104 and R-5015). **Figure 1-1** shows the major airspace components that would be used as part of the Proposed Action.

Four federal airways transect the airspace overlying Cannon AFB: V280, V276, V62, and J74. The published minimum en route altitudes for general IFR traffic operating along these Victor Routes are higher in the airspace than the altitudes normally flown by the military for training or

transit in the MTRs. Any general aviation aircraft that may follow these airways are also generally at altitudes above MTR traffic. “See and avoid” procedures also apply along the MTRs for military and general aviation aircraft. Jet Route J74 crosses east-west above the Pecos MOA through the altitudes of the Pecos Air Traffic Control Assigned Airspace (ATCAA). This route is controlled by the FAA Albuquerque ARTCC, which coordinates with Cannon AFB ATC in providing separation between the Jet Route traffic and military operations. Jet Route traffic in this area is normally assigned altitudes at or above 24,000 feet MSL along this route segment during times when military flight training is in progress (AFSOC 2014).

SUA associated with Melrose AFR support aircraft training including approaches, departures, low-level flying activities, and air-to-ground explosive and non-explosive munitions delivery (AFSOC 2014).

Types of SUA in the Cannon AFB region are discussed below.

- ***Restricted Area Airspace.*** Three restricted areas (R-5104A, R-5104B, and R-5105) comprise the airspace for Melrose AFR. R-5105 is north of Melrose AFR and extends from the ground surface to 10,000 feet MSL. R-5104A encompasses airspace overlying all of Melrose AFR and extends from the ground surface up to, but not including, 18,000 feet MSL. R-5104B includes airspace extending from 18,000 feet MSL to 23,000 feet MSL over R-5104A.
- ***MOAs.*** The Albuquerque ARTCC controls the Cannon MOAs. Flight operations out of Cannon AFB commonly involve use of the Pecos and Taiban MOAs. The Pecos North and Pecos South MOAs abut restricted airspace and extend from 500 feet AGL up to 18,000 feet MSL. The Taiban MOA extends from 500 feet AGL up to 11,000 feet MSL and serves primarily as additional maneuvering airspace for entering and exiting Melrose AFR restricted airspaces (R-5104/5105). The eastern portion of the Pecos MOA overlies the Taiban MOA to extend this training airspace from 11,000 feet MSL up to 18,000 feet MSL.

  Mount Dora and Bronco MOAs provide additional training airspace north and south of Cannon AFB, respectively. The Bronco MOA airspace/ATCAA area is divided laterally into four sections named Bronco 1 through Bronco 4. Bronco MOAs start at 10,000 feet MSL and extend to 18,000 feet MSL. The only exception is Bronco 1, which has a lower limit of 8,000 feet MSL. Bronco ATCAAs begin at 18,000 feet MSL. Bronco 1 and 2 extend up to 26,000 feet MSL, and Bronco 3 and 4 extend to 51,000 feet MSL. The MOAs are divided vertically and laterally. Mount Dora East, West, and North Low MOAs extend from 1,500 feet AGL to 11,000 feet MSL. The High MOAs begin at 11,000 feet MSL and extend up to 18,000 feet MSL. The Mount Dora ATCAAs begin at 18,000 feet MSL and extend up to 26,000 feet MSL. Because commercial aircraft routes extend through these areas, scheduling for these areas must be accomplished with Notices to Airmen (NOTAMs).

- ***ATCAA.*** Cannon AFB is located proximally to the Melrose, Pecos, Sumner, and Jordan ATCAAs. Melrose AFR ATCAA includes airspace extending from 24,000 up to 30,000

feet MSL above R-5104B. The Pecos ATCAA overlies the Pecos MOA, extending usable maneuvering airspace from an altitude of 18,000 feet MSL up to 23,999 feet MSL or as assigned by the Albuquerque ARTCC. The Sumner North/South ATCAAs overlie a large portion of the Pecos MOAs and adhere to the same lateral boundaries as the Pecos ATCAA. Sumner North ATCAA extends from 18,000 feet MSL up to 30,000 feet MSL. Sumner South extends from 18,000 feet MSL up to 50,000 feet MSL. The Sumner ATCAA is activated from 24,000 feet MSL to 51,000 feet MSL, or as assigned by ATC, when this additional airspace is required to fulfill high-altitude military training requirements. Jordan ATCAA is an airspace block that directly overlies Melrose AFR and R-5104A, the eastern portions of Pecos North MOA, and the northeast portion of Pecos South MOA and extends from 21,000 feet MSL to 23,000 feet MSL. A Certificate of Authorization (COA) allows RPA to operate within the Jordan ATCAA. Procedures for RPAs departing Cannon AFB require a ground observer between Cannon AFB and the restricted areas, then a climb within R-5104 airspace to at least 21,000 feet MSL, and then entry into the Jordan ATCAA.

- ***MTRs.*** Several MTRs are used for military flight operations and training on VR and IR navigation. The most commonly used MTRs proximal to Cannon AFB and Melrose AFR are IR-107, -109, -111, -112, and -113; VR-108, -100/125, and -114; and SR-212 and -213/214. The 9th and 16th SOS primarily use IR-109 for their C-130 training activities. SR structures are defined and explained along with scheduling procedures in the DoD AP/1B.

#### 3.3.2.1 CANNON AFB

***Cannon AFB Airfield***. Flight operations are conducted on two runways, 04/22 and 13/31. Runway 04/22, the main runway supporting between 60 and 70 percent of flight operations at the installation, is 10,000 feet long and 150 feet wide. Runway 13/31 is 8,200 feet long and 150 feet wide. Both runways have high-intensity lights, precision approach path indicators, instrument landing systems, and tactical air navigation approaches. The airfield historically supported more than 140,000 flight operations per year until the mid-2000s (CAFB 2017a). Flight operations at the installation are currently approximately 66 percent lower, operating at levels of approximately 45,000 annual flight operations.

***Current Operations***. The most frequent aircraft operated from Cannon AFB are fixed-wing aircraft (propellers) and rotary-wing aircraft (helicopters) such as the C-130 aircraft series (W and J models), CV-22, RPAs, and non-standard aircraft. USAF CV-22 aircraft and certain C-130 variants frequently conduct training activities at low altitudes including landing at the Red Horse landing zone (LZ) and DZs on Melrose AFR. C-130 gunships and RPA aircraft typically conduct training at high altitudes.

Fixed-wing aircraft operations at Cannon AFB are associated with AFSOC missions related to infiltration, exfiltration, and resupply of joint and coalition Special Operations Forces (SOF) and aerial refueling of SOF aircraft. Training for rotary-wing aircraft operations at Cannon AFB allows pilots to conduct day or night low-level penetration into hostile enemy territory and accomplish infiltration and exfiltration, aerial gunnery support, and resupply of SOF throughout

the world. A list of assigned (i.e., based) and transient aircraft at Cannon AFB and the associated flying units is presented in **Table 3-15**.

The C-130 (i.e., AC-130W and MC-130J) accounts for approximately 30 percent of the total flight operations at Cannon AFB. Non-assigned aircraft at Cannon AFB are considered transient. These aircraft typically land at other airfields to refuel or to conduct airfield training that cannot otherwise be accomplished at their home airfield. Transient aircraft operations account for approximately one percent of total operations at Cannon AFB.

**Table 3-15. Based Aircraft and 2017 Flight Operations at Cannon AFB**

| User Squadron/Unit | Aircraft Program | Annual Flight Operations |
|---|---|---|
| **Cannon AFB Assigned Aircraft** | | |
| 9th SOS | MC-130J | 4,584 |
| 16th SOS/551st SOS | AC-130W | 8,920 |
| 20th SOS | CV-22B | 2,624 |
| 318th SOS | U-28A/PC-12 | 20,684 |
| 12th SOS | MQ-9 | 7,904 |
| | *Total Assigned Aircraft Operations* | 44,716 |
| **Transient Aircraft** | | |
| Varies | C-12 | 40 |
| | C-17 | 76 |
| | C-21 | 18 |
| | F-16 | 52 |
| | F-18 | 104 |
| | B-767 | 54 |
| | UH-60 | 20 |
| | Piston | 164 |
| | *Total Transient Flight Operations* | 528 |
| | **TOTAL AIRCRAFT OPERATIONS** | 45,244 |

Source: CAFB 2017a

Flight operations data reported for Cannon AFB (FAA identifier: KCVS) indicated a total of 45,244 annual flight operations estimated for 2017 (CAFB 2017a). Flight operations for 2017 were estimated to be slightly lower than those reported during the previous 5 years due to the relocation of 551st SOS C-145/C-146 operations and 18 aircraft to Duke Field at Eglin AFB. The C-146 program at Cannon AFB had conducted approximately 14,000 flight operations with each training mission requiring an average flight time between 4 and 5 hours (Eglin AFB 2016).

RPA operations are allowed day or night in Class D airspace. Two transit corridors (i.e., Class E Corridor and Duster Corridor) are available for use by RPA between Cannon AFB and the SUA where these aircraft are operated (AFSOC 2014). The Class E Corridor exists from the ground surface to 4,000 feet AGL, connecting Class D airspace with R-5104A (see **Figure 1-1**). RPA climb within R-5104A and R-5104B into the Jordan ATCAA at high altitudes ranging between 21,000 and 23,000 feet MSL. The Duster Corridor is used for RPA transit from Cannon AFB airspace at altitudes between 19,000 feet MSL and 22,000 feet MSL, through the Sumner

ATCAA, to the White Sands Missile Range. The 27th SOW operations schedulers are responsible for deconfliction during RPA flight operations.

#### 3.3.2.2 NORTHEASTERN NEW MEXICO REGION

***Airfields***

***Melrose AFR LZs***. Melrose AFR does not have an established airfield. However, two LZs (Red Horse [TA-1A] and Hound [TA-3F]), which underlie the restricted airspace, are dirt runways that can accommodate fixed-wing landings (AFSOC 2014). The Red Horse LZ is the most readily capable to receive large and heavy aircraft such as C-130s. Thirty-three designated helicopter LZs (HLZs) provide a variety of options for helicopter training. Sixteen DZs provide a number of airdrop location options across the range.

***Other Nearby Airfields***. The Fort Sumner Municipal Airport (FAA indicator: KFSU) is the only public airport within close proximity to either the Pecos or Taiban MOAs located west of Cannon AFB. A charted MOA avoidance area requires military aircraft to remain above 1,500 feet AGL or to maintain at least 3 miles lateral separation when operating near this airport. Published airfield information indicates that this airport has an average of approximately 150 aircraft operations per year, with 67 percent of those operations associated with general aviation; the remaining 33 percent of flight operations are transient flights (Airnav.com 2018a). No commercial air service is conducted at this airport.

Two small, private airfields, Double V Ranch Airfield (FAA indicator: NM38) and Bojax Ranch Airport (FAA indicator: NM44), are located beneath or adjacent to the Pecos MOA/ATCAA (CAFB 2007). A limited number of aircraft operations are conducted at these private airfields (AirNav.com 2018b, Victor 2018). MOA flight training activities out of Cannon AFB have had no notable interaction or effects on aircraft operations at these airfields (CAFB 2007).

***Current Air Force Operations***

Melrose AFR currently provides air and ground training capabilities and supporting range facilities. Ground and air training-related features include ground training areas, DZs, LZs, and HLZs, a 10,600-acre impact area, an electronic combat range, and SUA. Types of training on Melrose AFR create weapons danger zones and surface danger zones over the range surface.

### 3.3.3 Environmental Consequences

The potential significance of impacts on airspace management depends on the degree to which the aircraft proposed for beddown and operation would affect the airspace environment. Significant impacts could result if implementation of the Proposed Action would: 1) impose major restrictions on air commerce opportunities; 2) significantly limit airspace access to a large number of users; or 3) require substantial modifications to air traffic control systems.

***General Impacts***

***Airspace Management***. Generally, impacts from the proposed additional aircraft and flight operations associated with the 9th SOS, 12/3/33rd SOS, 16th SOS, and 27th SOSS would result in increased air traffic in Melrose AFR, Pecos and Taiban MOAs, R-5104/5105, MTRs (i.e., IR-109), and the RPA corridor. However, even at the proposed peak operating level

wherein all aircraft associated with the Proposed Action are flying at the maximum proposed number of hours per year, the use of the local airspaces would not approach historic operating levels in the local airspaces.

The Proposed Action would not change airspace alignment, minimum or maximum altitudes, allowable times of use, existing training routes, or impact current or future military and general aviation uses of the airspace. The increases in air traffic required for the various training events would be temporary and would result in a minor overall increase in air traffic within the immediate airspace areas; therefore, the proposed training operations would not limit the ability of FAA and ATC to minimize the potential for conflicts through flight coordination and monitoring.

There would be no appreciable impacts on aviation safety or in airspace available for general use. Additionally, aircrews would be trained for all potential hazards present throughout the airspace operating areas. Because aircrews would continue to follow existing flight safety and Bird/Wildlife Aircraft Strike Hazard (BASH) protocols, the potential for aircraft mishaps or other flight hazards would be minimal.

Potential adverse impacts would be minimized through the following BMPs:

- Aircrews would coordinate with the Albuquerque ATCC or the appropriate ATC controlling agency and would adhere to applicable FARs, airspace management actions, USAF requirements, and FAA procedures. Such procedures include adherence to all applicable FAA flight rules when operating within controlled airspace and obtaining two-way radio communication with the appropriate ATC controlling agency when transiting through airspace associated with airports, airfields, or SUA.
- Aircrews would conduct proposed pilot proficiency training operations in accordance with all existing requirements for the use of the airspaces. Additionally, all necessary precautions would be taken while conducting training activities in uncontrolled airspace to avoid potential impacts on recreational aviators and other aircraft.

***Airfield Management***. Additional airfield support would be required from the proposed increase in aircraft for the 9th SOS and 16th SOS flight programs and for the increase in training activities for the 12th SOS RPA flight program. Given that the proposed flight operations originating from Cannon AFB would be conducted at a tempo that is approximately 65 percent of reported historical flight operations, impacts from the permanent end-state addition of 9 aircraft (4 MC-130J and 5 AC-130J) would be negligible to minor. Even at the peak of the interim beddown, with 13 total aircraft operating from the installation, airfield support and air operations would still be at levels less than in recent years. As proposed, the component actions associated with the Proposed Action would not meet or exceed the ATC or runway capacity of the airfield. Further, the proposed increases in aircraft and associated flight operations would be accommodated by the existing airfield and facilities, and would not require changes that would alter the existing runway or impede access to the airfield.

### 3.3.3.1 COMPONENT ACTIONS AND ALTERNATIVES

Specific impacts associated with each component action are described in the following paragraphs, as applicable.

#### *9th SOS MC-130J Aircraft Increase*

The proposed increase in operations by the 9th SOS mission would be accommodated by existing airspace areas, ATC facilities, and the airfield. No changes would be required that would alter the existing runway configuration or impede access to the airfield. Negligible impacts on airspace management would include the requirement for airspace deconfliction between the 9th SOS MC-130 and 16th SOS AC-130 aircraft during concurrent operations along IR-109 and the nearby airspace operating areas. Because the proposed MC-130J flight activities would be conducted in a manner consistent with the existing MC-130 aircraft program, no impacts on existing or projected flight operations would be expected.

#### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

This action would result in approximately an eight percent increase in personnel associated with the RPA flight program at Cannon AFB, and would increase weekly flight hours flown from 17 to 30 (representing a 76 percent increase in RPA flight hours) between the installation and Melrose AFR. Because the additional RPA flight operations would remain consistent with existing flight activities and would continue to operate within the dedicated RPA flight corridor and airspaces overlying Melrose AFR, impacts from this change would be limited to a minor increased use of existing airspace. Most proposed flight operations would be conducted at low altitudes similar to existing RPA mission activities; therefore, congestion impacts on localized air traffic would be negligible.

#### *16th SOS Upgrade of the AC-130W to AC-130J*

As noted for the 9th SOS component action, negligible impacts on airspace management from the addition of 5 AC-130J aircraft into the existing flight operations program would include the requirement for additional airspace deconfliction between the MC-130J and AC-130 aircraft during concurrent operations along IR-109 and the nearby airspace operating areas. Because the proposed AC-130J flight activities would be conducted in a manner consistent with the existing aircraft program, no appreciable impacts on existing or projected flight operations would be expected.

#### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* Long-term, negligible, intermittent, adverse impacts on airspace management would be expected from the addition of the proposed low-level flights required for the incorporation of CV-22 flights between Cannon AFB and Ute Reservoir. The annual increase in flight operations associated with these flights would not exceed the established operating capacities of the airspaces that would be used to accommodate the training. Short-term, minor aircraft noise impacts associated with two daytime and two nighttime, low-level, and slow overflights of CV-22 aircraft per month would be expected.

No aircraft landing at the reservoir would be required. **Section 3.1.3** (*Noise*) details the aircraft noise impacts anticipated as a result of the Proposed Action.

The CV-22 flights would occur between 500 and 1,000 feet AGL for each 30-minute flight leg between Cannon AFB and the reservoir using existing airspace routes and in continual contact with ATC to ensure appropriate safety measures and airspace deconfliction, as necessary. Therefore, impacts on airspace from these operations would be negligible.

*Conchas Lake Alternative.* Impacts under this alternative would be nearly the same as described for the Ute Reservoir Alternative, except that the transit time to and from the training area would require 35 minutes (5 minutes longer than the Ute Reservoir Alternative) of flight time per leg of the transit flight between Cannon AFB and Conchas Lake. This would entail an additional 5 minutes of low-level and slow flight of the CV-22 as the aircraft transits to the lake. Because overflights of Conchas Lake would be of short duration and limited to four training missions per month, associated aircraft noise impacts would be negligible. No appreciable impacts on recreational uses of Conchas Lake would be anticipated as a result of this action.

#### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* No impacts on airspace or airfield management would be expected with the implementation of this component action. However, because this action would temporarily take an existing simulator bay offline while the expanded facility is constructed and brought online, there is potential for this action to have short-term, minor impacts on the MC-130 flight training program as squadrons who are reliant upon the simulator facility to maintain operational currency may be delayed in their training and may have to travel elsewhere to achieve their training requirements.

*Building 4675 Expansion Alternative.* Similar to Building 724 Expansion, no impacts on airspace or airfield management would occur from the proposed construction and use of this expansion.

#### *27th SOMXS Munitions Storage Area Upgrades*

The munitions storage area upgrades would not involve changes to airspace or flight activities. Therefore, no impacts on airspace would be expected for this component action.

### 3.3.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Most proposed aircraft operations would involve flights within Melrose AFR, Pecos and Taiban MOAs, and MTRs that are already used by military aircraft transiting between the installation and those airspaces; therefore, interaction with civilian and commercial aircraft would be minimized. Aircraft would remain in contact with ATC to ensure appropriate deconfliction of airspace, if necessary. Annual operations occurring outside of the Cannon AFB Restricted Airspace and Melrose AFR would be distributed over a large area and similarly would not exceed the established capacities of respective airspaces. Relative to regional aircraft activity, net increases in flight activity under the Proposed Action would be negligible. As a result, impacts on airspace management at Cannon AFB and within the northeastern region of New Mexico would be long-term and negligible to minor.

### 3.3.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed component actions would not be implemented and the existing conditions for airspace and airfield management would remain unchanged.

# 3.4 Infrastructure/Transportation

## 3.4.1 Definition of Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity for expansion are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include utilities, solid waste management, airfield, and transportation. Utilities include electrical system, water supply, sanitary sewer and wastewater systems, stormwater drainage, natural gas supply, liquid fuel supply, and communications systems. Solid waste management primarily relates to the availability of systems and landfills to support a population's residential, commercial, and industrial needs. The airfield includes all pavements, runways, overruns, aprons, ramps, and arm/disarm pads that are associated with aircraft maintenance and aircraft operations. Transportation includes major and minor roadways that feed into the installation and the security gates, and roadways and parking areas on the installation. The infrastructure information contained in this section provides a brief overview of each infrastructure component and comments on its existing general condition.

## 3.4.2 Affected Environment

### 3.4.2.1 CANNON AFB

***Electrical System.*** Electrical power for Cannon AFB is supplied by Xcel Energy. The installation's 115-kilovolt transmission circuits are energized from either the Clovis substation east of the installation or the Blackwater Draw substation south of the installation. The Blackwater Draw substation is the primary source of power for the installation. One circuit is designed to solely feed the Southeast Development District and another is designed as a loop feed for the rest of the installation. The primary installation distribution system consists of underground and aboveground lines. The electrical system has the capacity to accommodate installation growth (CAFB 2016c, CAFB 2018).

***Water Supply.*** Cannon AFB currently relies entirely on its own wells for water. The water supply is groundwater withdrawn from the Southern High Plains Aquifer of the Ogallala Formation underlying the installation via nine production wells. Six of the production wells (PW) (PW-02, PW-03, PW-05, PW-07, PW-09, and PW-12) are exclusively dedicated to providing potable water to the water distribution system. PW-04 is exclusively a non-potable well for a pond along Air Commando Way. PW-04A is primarily a non-potable well used to replenish the golf course irrigation pond but can be used for potable purposes. PW-08 is primarily used to provide potable water to the water distribution system, but can also be used to replenish the golf course pond as required. An average of 571,600 gallons per day of water is used at Cannon AFB, while an average of 4,802,400 gallons of water is stored and available at any time on the installation (CAFB 2018).

The Southern High Plains Aquifer's supply of water is diminishing and Cannon AFB expects to use Ute Reservoir as a long-term sustainable water resource once the Ute Pipeline is available.

The Ute Reservoir, in northeastern New Mexico on the Canadian River, is a water right granted to New Mexico in an agreement with Texas and Oklahoma. The Ute Pipeline Project is currently being developed by the Eastern New Mexico Water System and is expected to be completed in 2019 (ENMWUA 2018). The Ute Pipeline Project includes a raw water intake at Ute Reservoir, a proposed 28 million gallons per day (mgd) water treatment facility, and approximately 150 miles of water conveyance pipelines to provide potable water to eight city and county member agencies and Cannon AFB for municipal, commercial and industrial use (see **Section 4.1.2** for additional information) (CAFB 2018).

***Sanitary Sewer***. Cannon AFB owns and operates its own sanitary sewer system and Wastewater Treatment Plant (WWTP). Domestic and industrial wastewater are delivered to the WWTP via a gravity sewer system comprised of 13 lift stations, 584 sewer manhole covers, and 58 miles of pipeline. The WWTP has an average daily flow capacity of 1.13 mgd, current average demand of approximately 0.277 mgd, and a peak daily design flow of 1.50 mgd. Reclaimed water from the WWTP is managed in accordance with the NMED Above Ground Use of Reclaimed Domestic Wastewater Guidance. National Pollutant Discharge Elimination System (NPDES) Permit Number NM0030236 regulates the quality of wastewater discharged from the WWTP to Cannon AFB's two permitted outfalls: North Playa Lake and the golf course pond. There are 13 metered septic tank/leach field systems that support 15 facilities on the installation (CAFB 2018).

***Stormwater System***. Stormwater flows are generally to the south and east across the installation. Stormwater runoff is contained on-installation where it either evaporates, infiltrates into the ground, or is collected by a drainage system of culverts, storm sewers, and ditches into North and South Playa Lakes, golf course ponds, and a detention basin near the Southeast Development District. An insignificant amount of stormwater may migrate off the installation in isolated areas such as the extreme northeast and northwest corners. North Playa Lake is in the eastern portion of Cannon AFB and collects stormwater runoff from the northeastern corner of the installation and a portion of the treated effluent from the WWTP. South Playa Lake is in the southwestern portion of the installation and collects stormwater runoff from the central and southwest portions, which includes the preferred site of the proposed 551st SOS simulator expansion. Southeast Development District runoff drains into a detention basin at that location. The playas and basin have no surface outlet, and any volume of stormwater collected evaporates or infiltrates and is not discharged off Cannon AFB (CAFB 2018).

Developed areas on the installation have underground storm drainage piping with associated catch basins, drain inlets, manholes and similar drainage appurtenances. The storm drainage system carries the collected stormwater to ditches and streams that remove it from the installation (CAFB 2018).

***Natural Gas.*** Natural gas is delivered to the installation through a transmission/distribution pipeline system owned and operated by the Public Service Company of New Mexico. Within the installation, an extensive network of natural gas lines is on the west side of the flightline and there are three natural gas storage facilities to the east of the golf course. In general, existing alignments of distribution mains, which are 6 inches diameter or greater, follow the roadway

network. The natural gas system has the capacity to accommodate installation growth (CAFB 2016c, CAFB 2018).

***Liquid Fuel.*** Aboveground storage tanks (ASTs) are housed in a complex immediately east of the Main Gate on Cannon AFB. These ASTs consist of two 840,000-gallon Jet A aviation fuel (Jet A) tanks, one 420,000-gallon Jet A tank, one 12,000-gallon gasoline tank, one 12,000-gallon ethanol gasoline and two 12,000-gallon ultra-low-sulfur diesel tanks. Fuel is delivered to Cannon AFB by commercial tank truck from Defense Logistics Agency–Energy. The 27th Special Operations Logistics Readiness Squadron Fuels Management Flight delivers Jet A to the flightline using 6,000-gallon R-11 refuelers and a modified Type 4 hydrant system. The hydrant system is equipped with two 25,000-gallon Jet A tanks. The jet fuel system has the capacity to accommodate mission growth (CAFB 2016c, CAFB 2018).

***Communications.*** The existing communications infrastructure at Cannon AFB consists of telephone, unclassified network, classified network, and defense messaging systems. A modern Data Center facility contains data center equipment for the installation. Cannon AFB hosts a wireless/wired network for all the dormitories. Other facilities on the installation are expected to receive the wireless/wired network in the near future (CAFB 2018).

***Solid Waste.*** The Perry Management Corporation maintains the solid waste management at Cannon AFB through contract collection and disposal. Steps are taken to collect the solid waste on the installation, which is then transported to the Clovis Regional Solid Waste Facility, an off-installation solid waste landfill, for disposal (CAFB 2018).

***Airfield.*** Cannon AFB operates two runways: main runway 04/22 and secondary runway 13/31. Main runway 04/22 is a precision instrument approach runway that is 10,000 × 150 feet. Secondary runway 13/31 is a precision instrument approach runway that is 8,200 × 150 feet. In addition to 2,900,000 $ft^2$ of runways, the flightline area includes 4,517,000 $ft^2$ of aprons, 594,000 $ft^2$ of overruns, and 2,117,000 $ft^2$ of taxiways. These areas include the Northwest Ramp, Southeast Ramp, and 80 aircraft parking positions. The Northwest Ramp is the main apron at Cannon AFB (CAFB 2018).

***Air Transportation.*** The nearest civilian airports are in Clovis, New Mexico; Lubbock, Texas; and Amarillo, Texas. The Clovis Municipal Airport has two paved runways and an auxiliary turf runway and receives a few daily flights by Boutique Air that connect in Dallas/Fort Worth International Airport (CAFB 2018).

***Off-installation Roadways.*** The local road network near Cannon AFB consists of U.S. Highway 60/84, U.S. Highway 70, and New Mexico State Highways 311 and 467. State Highway 467 connects Portales with Clovis and skirts the east side of Cannon AFB. The closest interstate highway is Interstate (I)-40, which is approximately 85 miles north of Cannon AFB (CAFB 2018).

***On-installation Roadways.*** Cannon AFB is accessible through two gates. The Main Gate is immediately south of U.S. Highway 60/84 on the north side of the installation. The designated

commercial gate is the Portales Gate, which is on the south side of the installation. A third gate, the West Gate, is currently closed to all traffic (CAFB 2018).

The road network on Cannon AFB consists of arterials, collectors, and local streets. Air Commando Way is the primary east/west transportation route in the cantonment area. Transportation routes around the edge of the community cantonment area include Eagle Claw Boulevard, Chindit Boulevard, North Perimeter Road, Eastern Perimeter Road, South Perimeter Road, and South Gunship Road. Major arterials through Cannon AFB are D.L. Ingram Boulevard, Casablanca Avenue, and Olympic Boulevard (CAFB 2018).

***Parking.*** Designated parking areas consume most of the landscape surrounding many existing facilities on the installation. There is sufficient parking throughout the installation for personnel.

#### 3.4.2.2 NORTHEASTERN NEW MEXICO REGION

##### *Melrose AFR*

***Airfield.*** Melrose AFR operates two fixed-wing LZs (i.e., Red Horse [TA-1A] and Hound [TA-3F]), which are dirt runways (AFSOC 2014).

***Transportation.*** The 60,000-acre Melrose AFR is accessible through three gates. The main gate is on Sundale Valley Road on the eastern side of Melrose AFR and the other two gates are along Krider Road in the northwestern and southwestern corners. The roadway system within and around Melrose AFR includes paved highways and paved arterials. U.S. Highway 60/84 travels east and west along the northern section of Melrose AFR. Krider Road travels north and south from U.S. Highway 60/84 along the western side of the range and provides a connection to the northwestern gate. Mesa Road is in the southern section of Melrose AFR and sometimes runs along the southern boundary. Sundale Valley Road parallels U.S. Highway 60/84 leading to the main gate near the center of the eastern boundary of Melrose AFR. Within the range, the existing roadway system includes a limited amount of paved roads to existing training and administrative facilities, but most of the circulation system consists of unimproved roadways and trails (AFSOC 2016).

##### *Ute Reservoir*

***Water Supply.*** Ute Dam is located along the Canadian River at the southeastern end of the Ute Reservoir. The dam and spillway provide 230,000 acre-feet of storage (RJH Consultants 2018). Ute Reservoir yields 24,000 acre-feet annually, which is intended to provide a renewable source of water for the surrounding region (New Mexico Office of the State Engineer 2018).

***Transportation.*** The primary boat launch site for the 27th SOSS SERE group at Ute Reservoir is approximately 91 miles from Cannon AFB via state roads, which is an approximately 90 minute drive via State Routes 311, 245, 209, 469, and 540 and US-54 north from Cannon AFB. The SERE group currently store their boats in a facility northwest of the primary boat launch site. This area is accessible via the paved State Park Road and paved residential roads such as Apache Road and Aztec Drive.

***Air Transportation***. The nearest civilian airports are Camco Ranch Airport and Tucumcari Municipal Airport. Camco Ranch Airport, a private airport, is approximately 24 miles northeast of Ute Reservoir. Tucumcari Municipal Airport is approximately 20 miles southwest of Ute Reservoir and experiences an average of 70 flights a day (AirNav.com 2018c).

#### *Conchas Lake*

***Water Supply***. Conchas Dam, on the eastern side of Conchas Lake, is just downstream from the confluence of the South Canadian and Conchas Rivers north of Cannon AFB. The lake is a reservoir that provides 259,000 acre-feet of storage for conservation and irrigation, 198,000 acre-feet for flood control purposes, and 70,500 acre-feet for sediment control (Lakeview Support Systems 2018).

***Transportation.*** Conchas Lake is approximately 110 miles from Cannon AFB, which is approximately a two-hour drive via US-60 West and State Routes 268, 209 and 104. Bell Ranch Road is a well-maintained two-lane paved road that runs past the dam around the eastern shore of the lake. Smaller paved roads provide access to the marinas, the state park, the campground, and residences on the southeastern side of the lake such as Lodge Road, Cannon Cove Drive, Big Mesa Avenue, Cove Campground Lane, and Conchas Drive.

***Air Transportation.*** The nearest civilian airports are Conchas State Park Airport and Conchas Lake Seaplane. Conchas State Park Airport is near the southeast shore of Conchas Lake and has two runways. Conchas Lake Seaplane operates out of property owned by the U.S. Army Corps of Engineers (USACE) on the southern shore of Conchas Lake (Lakeview Support Systems 2018).

## 3.4.3 Environmental Consequences

### 3.4.3.1 COMPONENT ACTIONS AND ALTERNATIVES

#### *9th SOS MC-130J Aircraft Increase*

The 9th SOS MC-130J aircraft increase would have long-term, negligible to no impact on the installation's infrastructure. Cannon AFB already has the infrastructure and fuel capacity to support this increase in aircraft, so no additional infrastructure or fuel system upgrades would be necessary. Sufficient housing and infrastructure capacity already exists on- and off-installation to accommodate the corresponding increase in personnel; therefore, no new infrastructure would be required to accommodate the increased use of utilities. The only new infrastructure that would be required is either a paved or gravel parking lot near Buildings 4624 and 4605 to accommodate the increased vehicular traffic. This increase in impervious surfaces would have negligible impacts on the rate and volume of stormwater runoff.

The increase in 9th SOS MC-130J aircraft would have long-term, negligible, adverse impacts on transportation at Cannon AFB and the northeastern New Mexico region. The increase in aircraft would consequently increase air traffic and increase the use of Melrose AFR, Taiban and Pecos MOAs, and MTRs for aircraft throughout northeastern New Mexico. As the additional flights would occur during the less-trafficked night hours and would only include a maximum of two additional flights, the impacts on air traffic would be negligible. There is already adequate

existing airspace available for the increase in air traffic. The increase in personnel associated with the increase in aircraft would add to existing road traffic to and from the installation. While the installation contains enough housing to accommodate the increase in personnel, some personnel may choose to reside off-installation and would travel to and from the installation during the work week.

### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

The 12th SOS increase in MQ-9 Reaper RPA personnel would have no impact on infrastructure at Cannon AFB. While there would be a subsequent increase in the use of materials such as fuel on the installation, no additional supporting infrastructure is required to accommodate this increase in personnel and Cannon AFB has the fuel capacity to support this increase in aircraft.

The 12th SOS increase in MQ-9 Reaper RPA personnel would have long-term, minor, adverse impacts on road traffic at Cannon AFB and the northeastern New Mexico Region. On- and off-installation commuting traffic would increase with the greater number of personnel working at Cannon AFB. Long-term, negligible, adverse impacts on air transportation could occur due to training activities that could involve touch-and-go operations at Melrose AFR. However, no air-based operations would originate or terminate at the range.

### *16th SOS Upgrade of the AC-130W to AC-130J*

The 16th SOS upgrade of the AC-130W to AC-130J would have no impacts on infrastructure or transportation at Cannon AFB or in the northeastern New Mexico region because, while fuel use would increase, the infrastructure already exists with the capacity to accommodate the increased fuel usage and aircraft parking. No other impacts on infrastructure would be expected from this component action.

### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* The 27th SOSS water safety training upgrades proposed at Ute Reservoir would result in long-term, negligible, adverse impacts on the infrastructure at Cannon AFB or the northeastern New Mexico region. Training activities at Ute Reservoir would result in no impacts on the water supply for Cannon AFB and the surrounding region. However, there would be an increase in fuel consumption for the safety training boats and aircraft. The installation's fuel supply would have sufficient capacity to accommodate these increases.

The 27th SOSS water safety training upgrades proposed at Ute Reservoir would have negligible to no impact on transportation at Cannon AFB or in the northeastern New Mexico region. While safety boat operators would be traveling from Cannon AFB to the training site at Ute Reservoir, this would not have any significant impact on traffic in this area because it would only involve use of two trucks. Because the training at the lake would be conducted on days when Ute Lake State Park has the fewest visitors during the work week, there would be negligible to no impacts on boat traffic. CV-22s would avoid civilian boats by at least 1,000 feet while conducting water operations. If this would not be possible due to civilian traffic, CV-22s would terminate water operations.

*Conchas Lake Alternative.* Negligible impacts on infrastructure would be similar but slightly greater than those described for Ute Reservoir. Increased flying time from Cannon AFB would result in slightly greater fuel consumption.

There would be negligible to no impacts on transportation at Cannon AFB or the northeastern New Mexico region. While there would be increased driving time for safety boat operators from Cannon AFB to Conchas Lake, this would not have any significant impact on traffic in the area.

### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* Expansion of Building 724 would have negligible, adverse impacts on infrastructure at Cannon AFB. Soil disturbance associated with construction and demolition activities would disrupt natural stormwater drainage flows until the areas are revegetated. However, the footprint of the construction would be approximately 0.3 acres; therefore, impacts on infrastructure would be negligible. Increases in solid waste associated with construction and demolition would be temporary and negligible, and would be disposed of in accordance with relevant federal, state, and local regulations.

Construction of the additional simulator facility and re-conversion of a simulator bay currently used for storage to another working simulator facility would require additions to the heating, ventilation, air conditioning, water chillers, and associated systems, which would feed off the existing electrical power grid and increase electrical consumption. The electrical tie-ins and infrastructure have the capacity to meet the demand from the new simulators; therefore, additions to the electrical systems would not be required and demand would be partially offset from lower power requirements for system upgrades. No new emergency generators or heating boilers would be required for this component action. A negligible increase in natural gas would occur from the operation of the expanded simulator facility.

The expansion of Building 724 for an additional flight simulator would have no impact on the transportation network at Cannon AFB because there would be no changes in traffic or parking.

*Building 4675 Expansion Alternative.* The expansion of Building 4675 would have negligible, adverse impacts on the infrastructure at Cannon AFB. Impacts on infrastructure would be similar to those described for Building 724.

The expansion of Building 4675 would have no impact on the transportation at Cannon AFB because there would be no changes in traffic or parking, apart from a limited number of personnel driving to the Southeast Development District instead of the area north of the airfield for simulator training under this alternative.

### *27th SOMXS Munitions Storage Area Upgrades*

The 27th SOMXS munitions storage area upgrades would have minor adverse impacts on the infrastructure at Cannon AFB. With the demolition and construction of three new buildings, two new storage bays, two new magazine igloos, and an operational facility to upgrade the munitions storage area, there would be changes to the electrical, heating, ventilation, air conditioning, stormwater, and sanitary sewer systems. Outdated systems and outlets would be removed and new systems and outlets would be added to the new construction.

Negligible impacts from solid waste generation associated with the construction activities would occur and would be disposed of in accordance with relevant federal, state, and local regulations.

The 27th SOMXS munitions storage area upgrades would have negligible to no adverse and minor beneficial impacts on transportation at Cannon AFB. Slight increases in traffic and parking lot use associated with demolition and construction equipment and contractor vehicles would occur. The construction activities would require delivery of materials to, and removal of debris from, construction sites. Once construction activities were complete, traffic patterns would be expected to return to their pre-construction levels because the number of total installation occupants would not be expected to change as a result of this component action. Due to the changes, the ESQD public traffic route danger arc for the munitions storage area would be revised to not include East Aderholt Loop.

#### 3.4.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Negligible to minor impacts on the infrastructure at Cannon AFB and the surrounding New Mexico region would occur from the Proposed Action. With the expansion of Building 724 and construction of new facilities, new utility tie-ins for electrical, heating and air conditioning, stormwater, and sanitary sewer systems would be added, but the existing infrastructure has the capacity to accommodate the increased demands and, therefore, would have negligible impacts. Impacts on the stormwater system resulting from soil disturbance by construction activities would be short-term and negligible. Similarly, any potential increase in solid waste removal would be appropriately handled for construction activities.

Negligible, adverse and minor, beneficial impacts on transportation at Cannon AFB and in the surrounding New Mexico region would occur from an increase in personnel and training activities under the Proposed Action. Temporary, negligible impacts on transportation at Cannon AFB would occur from a slight increase in traffic levels and decreased parking availability from construction activities and additional personnel. The ESQD public traffic route danger arc for the munitions storage area would be revised to not include East Aderholt Loop.

#### 3.4.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts on infrastructure and transportation at Cannon AFB and in the northeastern New Mexico region. Current training levels and operations would remain as described in **Section 3.4.2**; therefore, no changes would occur to the infrastructure or transportation systems at Cannon AFB and in the region.

## 3.5 Water Resources

### 3.5.1 Definition of Resource

Water resources are natural and man-made sources that are available for use by and for the benefit of humans and the environment. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes. Hydrology concerns the distribution of water to water resources through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow. Hydrology results primarily from temperature and total precipitation that determine evapotranspiration

rates, topography that determines rate and direction of surface flow, and soil and geological properties that determine the rate of subsurface flow and recharge to the groundwater reservoir.

Groundwater consists of subsurface hydrologic resources and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater features include depth from land surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations. Groundwater quality and quantity are regulated under several different programs including federal Underground Injection Control regulations authorized under the Safe Drinking Water Act.

Surface water resources generally consist of lakes, rivers, and streams. Surface water is important for its contribution to the economic, ecological, recreational, and human health of a community or locale. Waters of the United States are defined within the Clean Water Act (CWA), as amended, and jurisdiction is addressed by USEPA and USACE. Encroachment into waters of the United States requires a permit from the state and the federal government.

The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The CWA establishes federal limits, through the NPDES program, for the allowable amounts of specific pollutants that can be discharged to surface waters, to restore and maintain the chemical, physical, and biological integrity of the water. A water body can be deemed impaired if water quality analyses conclude that exceedances of CWA water quality standards occur.

The NPDES stormwater permitting program in New Mexico is regulated by USEPA Region 6. The NMED Surface Water Quality Bureau's Point Source Regulation Section assists USEPA with implementation of the NPDES permit program by performing inspections and providing information to local permitted entities (NMED 2018).

In general, the NPDES stormwater permitting program requires permits for discharges from construction sites that disturb 1 or more acres and discharges from smaller sites that are part of a larger common plan of development or sale. Because no waters of the United States have been documented at Cannon AFB, the installation has determined it is not regulated by the NPDES program. Cannon AFB does not require construction contractors to obtain individual construction NPDES permit coverage (Rebman 2016). However, any soil disturbance requires an Erosion and Sedimentation Control Plan (ESCP). Additionally, all contractors on Cannon AFB are required to use the *Cannon AFB and Melrose AFR Civilian Contractor Environmental Guide* for any contract or construction project. USACE requires that its contractors performing projects on the installation obtain NPDES permit coverage and implement a Storm Water Pollution Prevention Plan (CAFB 2015, Rebman 2016).

In addition, construction site owners and operators that disturb 1 or more acres of land are required to use BMPs to ensure that soil disturbed during construction activities does not pollute nearby water bodies. Construction activities disturbing 20 or more acres must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. Additionally, as of February 2014, construction site owners and operators that disturb 10 or

more acres of land are required to monitor discharges to ensure compliance with effluent limitations specified by the permitting authority.

Under Section 438 of the Energy Independence and Security Act (EISA) of 2007, federal agencies have requirements to reduce stormwater runoff from federal development and redevelopment projects to protect water resources. Federal agencies can comply using a variety of stormwater management practices often referred to as “green infrastructure” or “low-impact development” practices, including, for example, reducing impervious surfaces, using vegetative practices, porous pavements, cisterns, and green roofs to maintain or restore predevelopment site hydrology to the maximum extent technically feasible.

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. The USACE regulates the discharge of dredged or fill material into waters and wetlands of the United States pursuant to Section 404 of the CWA. Section 401 of the CWA requires that any application for a federal license or permit to conduct an activity that could result in a discharge into waters of the United States provide the permitting agency a certification from the state in which the discharge originates certifying that the license or permit complies with CWA requirements, including applicable state water quality standards.

It is USAF policy to avoid construction of new facilities within areas containing wetlands where possible per AFI 32-7064, *Integrated Natural Resources Management*, and EO 11990. A FONPA must be prepared and approved by HQ AFSOC for all projects impacting wetland areas.

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and diversification of plants and animals. Floodplain storage reduces flood peaks and velocities and the potential for erosion. Floodplains are subject to periodic or infrequent inundation because of rain or melting snow. The risk of flooding typically depends on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain. The 100-year floodplain is an area that has a 1 percent chance of inundation by a flood event each year. Certain facilities inherently pose too great a risk to be in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities to reduce the risks of human health and safety.

It is USAF policy to avoid the construction of new facilities within the 100-year floodplain if possible per AFI 32-7064 and EO 11988. A FONPA must be prepared and approved by HQ AFSOC for all projects impacting floodplain areas.

## 3.5.2 Affected Environment

### 3.5.2.1 CANNON AFB

***Groundwater***. The unconfined Ogallala Formation is bounded at its base by the impermeable Chinle Formation, and is the main water-yielding unit of the Southern High Plains Aquifer (CAFB 2018, Langman et al. 2006) that underlies Cannon AFB. This aquifer is part of the larger High Plains Aquifer System commonly referred to as the Ogallala Aquifer. The Ogallala Aquifer covers an area of approximately 174,000 square miles, spanning eight states: South Dakota, Wyoming, Nebraska, Kansas, Colorado, Oklahoma, Texas, and New Mexico (Langman et al. 2004). Approximately 90 percent of the water drawn from the aquifer around Cannon AFB is used for agricultural irrigation (USDOI 2011). Recharge of the Ogallala Aquifer is primarily through precipitation. Estimated recharge rates are less than 1 inch per year (Langman et al. 2006, Musharrafieh and Logan 1999).

The Ogallala Aquifer is essentially being mined because groundwater removed from the aquifer for agricultural use far exceeds any recharge that occurs. As water is removed from the aquifer, groundwater migrates from higher elevations to lower elevations and wells on the fringes become dry, or, the saturated thickness of the aquifer becomes so thin that it is no longer feasible to use (Langman et al. 2006).

At Cannon AFB, groundwater mining has been observed through historical water level measurements recorded at numerous wells on installation and in the surrounding area. Recent annualized declines in water levels (reduced saturated thickness) of approximately 2 feet were reported in 2012 (Trinity 2012). The estimated saturated thickness of the aquifer beneath Cannon AFB around 1940 was 100 to 170 feet. As a result of groundwater mining, the general thickness of the saturated section was reduced to approximately 50 feet by 2011. This reduction is unsustainable without alternative water supply systems.

Regional groundwater flow direction of the Southern Highland Plains Aquifer is generally to the east and southeast (Langman et al. 2006, Hart and McAda 1985) with average hydraulic gradients across eastern New Mexico and western Texas of about 0.0018 feet per foot in early 2000. Locally, groundwater flow is influenced by the presence of paleochannels containing more highly transmissive sediments and the occurrence of springs (Blanford et al. 2003). Numerous cones of depression created by 50 years of groundwater pumping have modified and in some cases reversed groundwater flow gradients around heavily irrigated areas (Musharrafieh and Logan 1999).

***Surface Water***. There are no naturally occurring surface water bodies, major drainage ways, perennial streams, or jurisdictional waters on the installation (CAFB 2016b). There are six man-made water bodies on the installation: North Playa Lake in the east-central part of the installation, South Playa Lake in the southwest, a stormwater pond in the south, and three ponds at the golf course (see **Figure 3-5**). North Playa Lake receives treated effluent from the WWTP and is unlined. Much of this water evaporates, while some infiltrates into the subsurface. The golf course ponds also receive treated effluent from the WWTP. Water from all of the golf course ponds is applied to the golf course for irrigation (CAFB 2016c).

***Wetlands.*** Wetlands on Cannon AFB are primarily associated with playa wetland communities in basins that have been impacted at varying degrees by past agricultural and USAF activities. Fringe wetlands occur below ordinary high-water marks on gradually sloping areas along the shoreline on the North Playa basin along East Aderholt Loop because of natural and anthropogenic water level drawdowns during the growing season. The South Playa basin to the southwest of the flightline (airfield runway area) was excavated to handle additional stormwater runoff and growth of the Southeast Development District. Drainage from the surrounding uplands supports a wetland plant community when the area is temporarily flooded. A 3.2-acre palustrine emergent wetland (South Playa Lake) is located between the southern ends of the two runways. The wetland hydrology is largely supplied by surface water runoff from the runways. During precipitation events, large amounts of surface water drain to the wetland forming a temporary lake. The wetland is unlined so standing water evaporates or infiltrates into the subsurface. There are no jurisdictional waters of the United States on Cannon AFB (CAFB 2005, CAFB 2016c, USFWS 2018g).

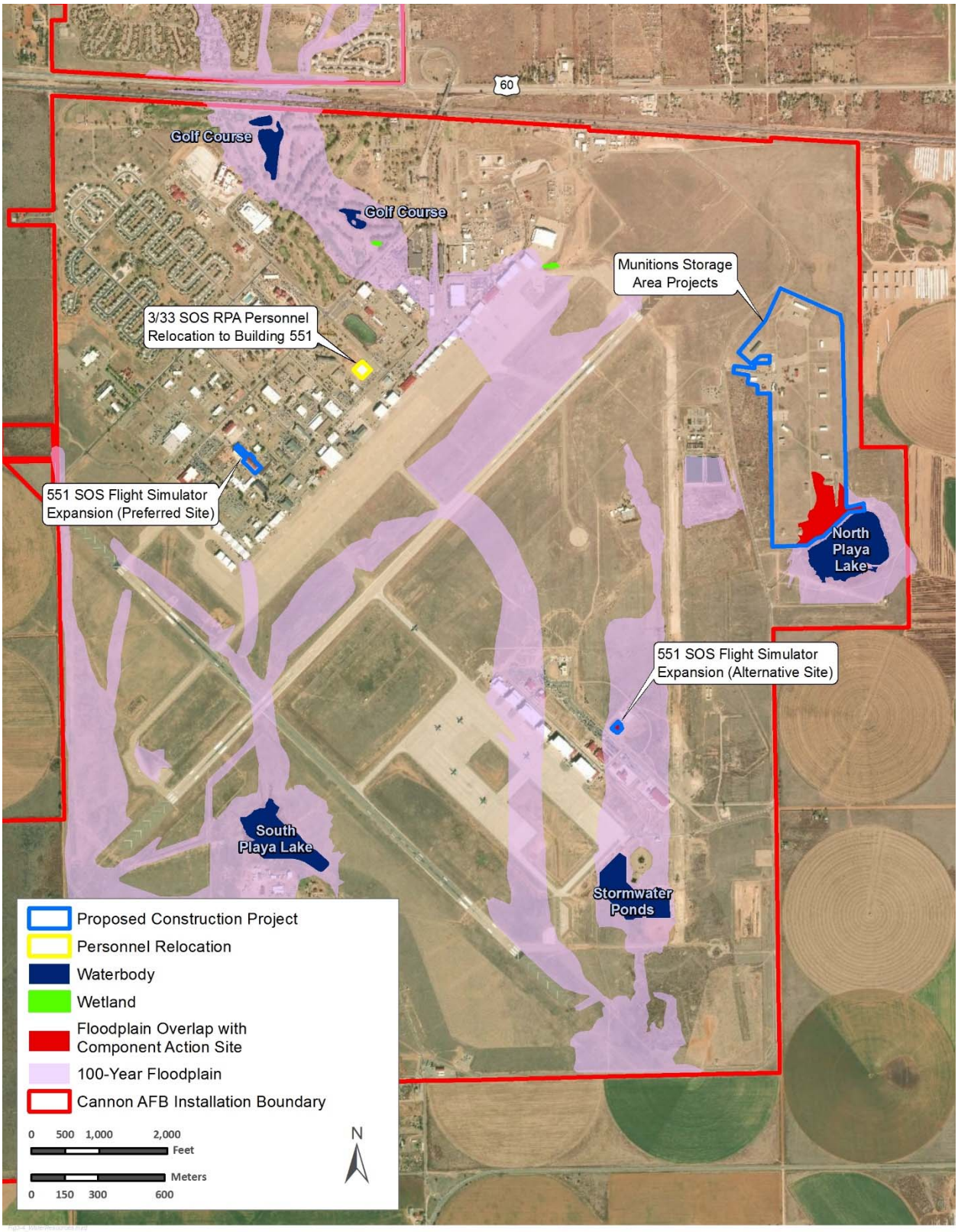
***Floodplains.*** Although there are no major drainageways on the installation, potential flooding areas and conceptual solutions to address flooding problems around the installation were identified in a 2009 drainage study for the installation (CAFB 2016c). A significant flow of surface drainage from north of Cannon AFB across the cantonment area and flightline toward the southeast occurs during heavy rain events. This flow area is identified as the 100-year floodplain for Cannon AFB; however, there are no FEMA floodplains identified near Cannon AFB (FEMA 2017a). Portions of the munitions storage area and the alternative site for the 551st SOS flight simulator expansion are within the 100-year floodplain (see **Figure 3-5**).

#### 3.5.2.2 NORTHEASTERN NEW MEXICO REGION

***Groundwater.*** The region is underlain by the unconfined Southern High Plains Aquifer in the Ogallala Formation. Regional thickness of the aquifer ranges from where the formation wedges out against older rocks to as much as 150 feet. Groundwater flows generally in an east to southeast direction and the water table slopes at a relatively flat 7 to 15 feet per mile (CAFB 2012). See **Sections 3.4.2.1** and **3.5.2.1** for discussion on regional groundwater consumption issues.

***Surface Water.*** There are no major drainageways or perennial streams on Melrose AFR. The predominant water features present in the region are ephemeral streams. These drainages do not typically contribute flow to river valleys into which they eventually drain (the Red, Brazos, or Canadian) because most of the precipitation is lost to evaporation and infiltration. Most of the runoff in the region is captured in numerous impoundments that are used as sources of water for livestock (USAF 2011).

Ute Reservoir has a 132-foot high earthen embankment dam on the Canadian River, 2 miles west of Logan, New Mexico, and is owned and operated by the New Mexico Interstate Stream Commission. It was constructed in 1963 for recreation, municipal conservation, flood control, and raw water storage. The dam and spillway were substantially modified in 1984 to increase the storage capacity of the reservoir to 130,000 acre-feet (RJH Consultants 2018, NM OSE 2018).




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 3-5. Cannon AFB Water Resources**

Conchas Dam, just downstream from the confluence of the South Canadian and Conchas Rivers, was constructed in 1939. Conchas Lake provides 259,000 acre-feet of storage for conservation and irrigation that supply the Arch Hurley Conservation District. The reservoir has 198,000 acre-feet of storage space allocated for flood control purposes and another 70,500 acre-feet for sediment control (Lakeview Systems Support 2018).

***Wetlands.*** Melrose AFR has seasonally inundated areas and seasonal aquatic habitats, including several minor surface water features and ephemeral streams and drainages. No permanently flooded areas are on the range. Two wetlands, emergent marsh areas created from overflows from adjacent wells that have been allowed to naturalize over time, are present on the northern end of the range. No formal jurisdictional waters of the United States, including wetlands, are located within Melrose AFR (AFSOC 2016). Wetlands are present in limited areas around the perimeter of Ute Reservoir and Conchas Lake (USFWS 2018g).

***Floodplains.*** No 100-year floodplains are located on Melrose AFR or the area surrounding Conchas Lake (CAFB 2017b, FEMA 2017a). FEMA identifies Conchas Lake itself as a 100-year floodplain, and Ute Reservoir and the adjacent area are identified as areas where FEMA has not completed a study to determine the flood hazard (FEMA 2017b, FEMA 2017c).

## 3.5.3 Environmental Consequences

### 3.5.3.1 COMPONENT ACTIONS AND ALTERNATIVES

#### *9th SOS MC-130J Aircraft Increase*

Short- and long-term, negligible, adverse impacts on water resources would be expected from the ground-disturbing activities associated with the proposed increase in MC-130J aircraft. Long-term, negligible, adverse impacts on groundwater would occur as a result of this component action because of the increased water requirements for personnel. It is expected that the increase in operations and personnel would slightly increase water demand and contribute to continued drawdown of the regional groundwater aquifer. Short-term, adverse impacts on surface waters would be expected from the construction of the paved or gravel parking lot. If the parking lot is paved, long-term impacts on surface water due to increased runoff velocity would be expected from an increase in impervious surfaces. These impacts would be minimized by implementing BMPs and following an approved ESCP to ensure that soil disturbed during construction would not negatively impact overland flow on the installation. Because the area to be disturbed is less than 1 acre of land, it would not be subject to NPDES permitting by USACE. Long-term, negligible impacts on wetlands would occur from a slight increase in pollutants in stormwater runoff resulting from the operation of additional aircraft using the airfield. No impacts on floodplains would be expected under this component action. The increase in aircraft, personnel, mission activities, and use of materials would not be expected to result in any additional adverse impacts on water resources at Cannon AFB or in the northeastern New Mexico region.

#### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

Long-term, negligible, adverse impacts on groundwater would occur as a result of this component action because of the increased water requirements for personnel and visitors. It is

expected that the increase in operations and personnel would slightly increase water demand and contribute to continued drawdown of the regional groundwater aquifer. No adverse impacts on surface water, wetlands, and floodplains at Cannon AFB or in the northern New Mexico region are expected from the proposed personnel, mission activities, and use of materials because this component action would have no ground-disturbing activities and, therefore, no changes to impervious surfaces.

### *16th SOS Upgrade of the AC-130W to AC-130J*

Other than negligible impacts on wetlands from pollutants from the airfield due to operation of 4 additional AC-130J aircraft, no adverse impacts on water resources at Cannon AFB or in the northeastern New Mexico region are expected. This component action would have no ground-disturbing activities and no additional personnel, and result in no changes to impervious surfaces.

### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* Negligible adverse impacts on water resources at Ute Reservoir are expected from the proposed upgrades of water safety training. The continued use of the small quantity of approved dye markers, which contain up to a maximum of 1 percent insoluble materials (DoD 1973), up to two times a month to identify locations of swimmers would not impact water quality because it would dilute quickly in a lake the size of Ute Reservoir. Negligible impacts on water quality would occur from continued exhaust from boat engines. This component action would result in no ground-disturbing activities and no changes to impervious surfaces.

*Conchas Lake Alternative.* Negligible adverse impacts on water resources at Conchas Lake similar to those discussed for Ute Reservoir are expected from the proposed upgrades of water safety training. This component would result in no ground-disturbing activities and no changes to impervious surfaces.

### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* Short- and long-term adverse impacts on water resources would be expected from the proposed upgrade of the Echo simulator facility and construction of the new Foxtrot simulator facility. Short-term, negligible to minor, adverse impacts on surface water would be expected from ground-disturbing activities associated with construction. Long-term, minor, adverse impacts would be expected to result from the increase of impervious surfaces, minor alteration of the natural drainage flows that would occur during construction activities, and the potential removal of groundcover and vegetation, which could increase soil erosion and sedimentation. Adverse impacts would be minimized by implementing BMPs and following an approved ESCP to ensure that soil disturbed during construction activities does not impact nearby water bodies. Because the area to be disturbed is less than 1 acre, it would not be subject to NPDES permitting by USACE. No short- or long-term adverse impacts on wetlands or floodplains are expected. It is expected that the increase in operations would slightly increase water demand and contribute to continued drawdown of the regional groundwater aquifer. Measures to address water management on the installation include continued implementation of water conservation education and installation of low-flow devices.

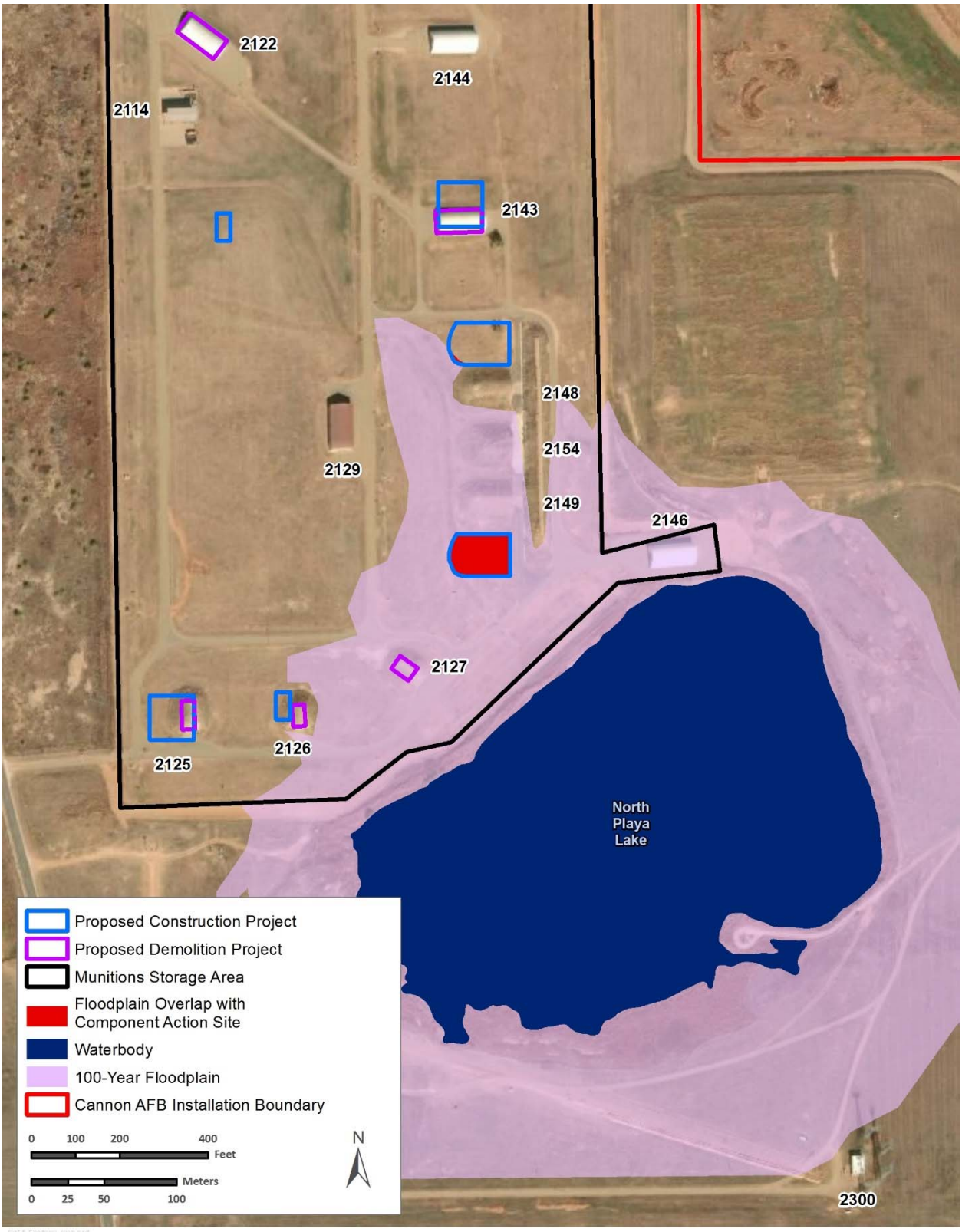
The increase in personnel and training activities would not be expected to result in adverse impacts on wetlands or floodplains at Cannon AFB or in the northeastern New Mexico region.

*Building 4675 Expansion Alternative.* Short- and long-term, negligible to minor, adverse impacts on water resources would be expected from this alternative. Short-term, negligible, adverse impacts on surface water would be expected from ground-disturbing activities associated with construction. This alternative would result in an increase in impervious surface and occur within the 100-year floodplain. Due to the existence of the existing simulator facility at Building 4675 and the need for operational training efficiencies, the expansion for additional simulator requirements is best achieved through an addition to Building 4675 under this alternative. While it is recognized that Building 4675 is within a floodplain, this is the best solution to accommodate the project purpose and need. Construction in the floodplain would constrict stormwater runoff, resulting in long-term, minor, adverse impacts on the floodplain. Adverse impacts would be minimized through design, siting, and proper implementation of environmental protection measures such as soil-erosion control measures, stormwater management, or timing ground-disturbing activities to minimize exposure of cleared surfaces. Impacts would also be minimized by elevating structures above the floodplain as appropriate. Additionally, an approved ESCP would be following during construction and construction BMPs would be implemented to retain runoff and promote recharge of groundwater.

### *27th SOMXS Munitions Storage Area Upgrades*

Short- and long-term impacts on water resources would be expected to result from the proposed munitions storage area upgrades. Short-term, negligible to minor, adverse impacts on surface water would be expected from ground-disturbing activities associated with demolition and construction. Long-term, minor, impacts on groundwater and surface water would be expected from the increase of impervious surfaces, minor alteration of the natural drainage flows during construction and demolition, and the potential removal of groundcover and vegetation, which could increase soil erosion and sedimentation. Adverse impacts would be minimized by implementing BMPs and following an approved ESCP. Because the area to be disturbed is greater than 1 acre of land and subject to NPDES permitting by USACE, BMPs would be implemented to ensure that soil disturbed during construction activities would not impact nearby water bodies.

The sites for both earth-covered magazines proposed in Phase 5 of this action overlap the 100-year floodplain (see **Figure 3-6**). Construction of structures in the floodplain would constrict stormwater runoff, resulting in long-term, minor, adverse impacts. Siting of these facilities within the floodplain cannot be avoided because of the need to construct within the existing ESQD arc without expanding the arc, the limited space available within the munitions storage area, and the need to set back the magazines based on DoD design criteria based on the planned net explosive weight and types of materials to be stored in each magazine. The two munitions storage area magazines would be sited near the fringe of the mapped floodplain, and no actual flood events from overflow of isolated North Playa Lake have been recorded as reaching these fringe areas. One of the two proposed magazines sites is on the mapped floodplain boundary and could be reconfigured to avoid the mapped floodplain during project design.




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 3-6. Floodplains within the Munitions Storage Area**

Impacts would be minimized through design, siting, and proper implementation of environmental protection measures such as soil-erosion control measures, stormwater management, or timing ground-disturbing activities to minimize exposure of cleared surfaces.

Long-term, beneficial impacts would be expected from the demolition of Building 2127, which is currently in the 100-year floodplain, and conversion of that site to a pervious surface. No adverse impacts on wetlands would be expected from this component action.

#### 3.5.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Short- and long-term, negligible to minor, adverse impacts on water resources would be expected from implementation of the Proposed Action. Short-term impacts would be expected from ground-disturbing activities associated with demolition and construction. Long-term, minor, adverse impacts would be expected from the increase of impervious surfaces, minor alteration of the natural drainage flows during construction and demolition, and the potential removal of groundcover and vegetation, which could increase soil erosion and sedimentation. Impacts would be minimized by implementing BMPs and following an approved ESCP. If the area to be disturbed is greater than 1 acre of land and subject to NPDES permitting by USACE, BMPs would be implemented to ensure that soil disturbed during construction would not impact nearby water bodies. Long-term, minor impacts would occur from the construction of facilities in floodplains. Long-term, beneficial effects would be expected from the demolition of Building 2127, which is in the 100-year floodplain.

The increase of approximately 164 personnel at the installation would result in an additional water consumption rate of approximately 13,300 gallons per day (or 4.9 million gallons per year) based on a per capita domestic consumption rate of 81 gallons per day for New Mexico (USGS 2018). The regional consumption rate for communities in Curry and Roosevelt Counties, who currently rely entirely on groundwater, is approximately 14,671 acre-feet per year, or 4.8 billion gallons per year (USDOI 2011). The Proposed Action would represent a 0.1 percent increase in water consumption in the region. Therefore, the increase in personnel would negligibly contribute to the groundwater source drawdown in the northeastern New Mexico region. The increase in training activities would not be expected to result in any additional adverse impacts on water resources at Cannon AFB or in the region.

#### 3.5.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, no new or increased impacts would occur because the realignment of aircraft and personnel and associated increase in training and infrastructure improvements would not be implemented. The existing conditions discussed in **Section 3.5.2** would remain unchanged. Building 2127, an earth covered magazine storage facility where ammunition and explosives are stored in the munitions storage area, would continue to be exposed to flooding.

# 3.6 Biological Resources

## 3.6.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats (e.g., wetlands, forests, grasslands) in which they exist. Protected and sensitive biological resources include federally listed (endangered or threatened) species, designated or proposed critical habitat, species of concern managed under conservation agreements or management plans, and state listed species.

Under the ESA, an endangered species is defined as any plant or animal in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species likely to become endangered in the foreseeable future. Section 7 of the ESA requires federal agencies, in consultation with USFWS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. A candidate species is a plant or animal for which USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other priority listing activities. Species of concern are not protected under the ESA but have been identified as important to monitor (USFWS 2012).

The ESA also generally prohibits any action that causes a “take” of any listed species. “Take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.” Not all take is prohibited. Where appropriate, incidental take statements can be provided that allow take of threatened or endangered species that are incidental to an otherwise legal activity. Air Force Policy Directive 32-70, *Environmental Quality*, directs the implementation of the ESA for USAF.

The New Mexico Department of Game and Fish (NMDGF) maintains a list of species designated endangered, threatened, of greatest conservation need, or sensitive within the state per the New Mexico Wildlife Conservation Act (NMDGF 2016). AFI 32-7064*, Integrated Natural Resources Management*, calls for the protection and conservation of state listed species when not in direct conflict with the military mission. Species of Greatest Conservation Need (SGCN) are not protected under the New Mexico Wildlife Conservation Act, but are associated with key habitats; have low or declining populations; or have high recreational, economic, or charismatic value.

The Migratory Bird Treaty Act (MBTA) is the primary legislation in the U.S. for the conservation of migratory birds. The MBTA prohibits the intentional and unintentional taking, killing, or possession of migratory birds unless permitted by regulation. EO 13186, *Responsibilities of Federal Agencies to Protect Birds*, provides a specific framework for the federal government’s compliance with its MBTA obligations and aids in incorporating national planning for bird conservation into agency programs. A Memorandum of Understanding exists between DoD and USFWS to promote the conservation of migratory birds in compliance with EO 13186.

Bald and golden eagles receive additional federal protection under the Bald and Golden Eagle Protection Act (16 USC § 668–668d). This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald and golden eagles, including their parts, nests, or eggs.

Birds and wildlife have the potential to cause millions of dollars in damage to aircraft as well as the loss of human life of aircrews and passengers. Flight Safety is the office of primary responsibility for monitoring and implementation of the BASH Plan per Air Force Pamphlet 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques*. Cannon AFB has an active BASH program to reduce the potential for bird and wildlife strikes and enhance airfield safety (CAFB 2007).

## 3.6.2 Affected Environment

### 3.6.2.1 CANNON AFB

***Vegetation.*** The proposed demolition and construction project areas are in urban or disturbed grassland habitat as identified in the Cannon AFB *Integrated Natural Resources Management Plan* (CAFB 2016b). The proposed paved or gravel parking lot under the 9th SOS MC-130J Aircraft Increase component action would be in disturbed grassland habitat. The proposed simulator facility at Building 724 would occur in urban habitat, and the alternative site at Building 4675 would occur in disturbed grassland habitat. The proposed 27th SOMXS Munitions Storage Area Upgrades would occur in urban habitat (CAFB 2016b).

Urban habitat is primarily associated with landscape vegetation. This vegetation is highly maintained and primarily composed of ornamental and non-native grasses, shrubs, and trees. Common grass species are Bermuda grass (*Cynodon dactylon*), Johnson grass (*Sorghum halapense*), buffalograss (*Bouteloua dactyloides*), tumble windmillgrass (*Chloris verticillata* Nutt.), and blue grama (*Bouteloua gracilis*). Siberian elms (*Ulmus pumila*), as well as other various ornamental trees and shrubs, are present throughout the urban habitat. The disturbed grassland habitat is primarily composed of the same common grass species in urban habitat and dispersed forbs such as sandbur (*Cenchrus spinifex*), Russian thistle (*Salsola targus*), pigweed (*Amaranthus* spp.), and kochia (*Kocia scoparia*) (CAFB 2016b). The urban and disturbed grassland areas are maintained with mowers, trimmers, and other standard vegetation management equipment (CAFB 2005, CAFB 2016b).

***Wildlife.*** A variety of resident, transitory, and migrant wildlife species are present within the highly modified habitats on Cannon AFB. The large trees and shrubs within the landscaped areas of the urban habitat provide habitat for common avian species such as mourning dove (*Zenaida macroura*), Eurasian collared dove (*Streptopelia decaocto*), great-tailed grackle (*Quiscalus mexicanus*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and American robin (*Turdus migratorius*). Common wildlife found in the disturbed grassland habitat include the harvest mouse (*Micromys minutus*), coyote (*Canis latrans*), raccoon (*Procyron lotor*), thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*), burrowing owl (*Athene cunicularia*), long-billed curlew (*Numenius americanus*), and various other small mammals. Black-tailed prairie dogs (*Cynomys ludovicianus*) are also present in the disturbed

grassland habitat. Their abandoned burrows are used by burrowing owls, desert cottontail rabbits, snakes, lizards and other wildlife (CAFB 2016b).

North Playa Lake is immediately south of the Munitions Storage Area and is the most significant playa on Cannon AFB for wildlife habitat. Amphibians commonly found include the barred tiger salamander (*Ambystoma tigrinum*) and plains leopard frog (*Rana blairi*), which is a NMDGF SGCN (CAFB 2016b, NMDGF 2018a). The most common reptile is yellow mud turtle (*Kinosternon flavescens*). Ducks, waders, and shorebirds are also often present. Common bird species observed during the summer include double-crested cormorant (*Phalacrocorax auritus*), American avocet (*Recurvistra americana*), great blue heron (*Ardea herodias*), and black-crowned night heron (*Nycticorax nycticorax*). Common species observed during migration and winter seasons include mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*), northern shoveler (*Anas clypeata*), and ruddy duck (*Oxyura jamaicensis*). Various mammals use the playa lakes as a source of drinking water. Additionally, coyote, desert cottontail (*Sylvilagus audubonii*), striped skunk (*Mephitis mephitis*), deer mouse (*Peromyscus* sp.), hispid cotton rat (*Sigmodon hispidus*), and southern plains woodrat (*Neotoma micropus*) have been found using concrete structures in the center of North Playa Lake (CAFB 2016b).

***Protected Species.*** No federal or state-listed species permanently reside on Cannon AFB; however, some of these species have been observed in a transitory state. During a 2015–2016 survey for listed species, no federally or state-listed species were observed on the installation, but three species currently identified as federal species of concern were observed. These species were the burrowing owl, prairie falcon (*Falco mexicanus*), and lark bunting (*Calamospiza melanocorys*). There is no critical habitat on Cannon AFB (CAFB 2016b, USFWS 2018a).

The least tern (*Sternula antillarum*) is the only federally listed endangered species that could occur on Cannon AFB; however, the species is unlikely to occur (see **Table 3-16**) (NMDGF 2018b, USFWS 2018a, CAFB 2016b). There are also 14 federal species of concern that could occur on Cannon AFB. The lesser prairie-chicken (*Tympanuchus pallidicinctus*) is under review for federal listing and considered for analysis while its status is being determined; however, habitat for the species does not occur on the installation (CAFB 2016b). Species with a potential to occur near the project areas are listed in **Table 3-16** and described further below. Based on habitat requirements for the species listed, North Playa Lake provides the most important potential habitat near the project areas.

The least tern is uncommon in the region but is present in the summer months during breeding and migration to its wintering habitat (Audubon 2018, USFWS 2018a). The closest known breeding location is Bitter Lake National Wildlife Refuge, approximately 95 miles southwest of Cannon AFB near Roswell, New Mexico (CAFB 2007). The least tern has not been observed on Cannon AFB to date (CAFB 2007, CAFB 2016b). In the unlikely event, that a least tern would use Cannon AFB during its migration to regional breeding grounds, it could use the installation's ponds and lakes for foraging and potentially nest along North Playa Lake; however, it is not expected to occur within the project areas.

The lesser prairie-chicken is under review for federal listing and is a NMDGF SGCN (NMDGF 2018a, USFWS 2018b). The lesser prairie-chicken prefers natural grasslands, which are not found on Cannon AFB. This species was not observed during the 2015–2016 surveys and is not expected to occur because no preferred habitat is present on Cannon AFB. As a result, its occurrence on Cannon AFB is unlikely (CAFB 2016b). Similarly, Arctic peregrine falcon (*Falco peregrinus tundrius)*, peregrine falcon (*Falco peregrinus*), Baird's sparrow (*Ammodramus bairdii*), bald eagle (*Haliaeetus leucocephalus*), Bell's vireo (*Vireo bellii*), neotropic cormorant (*Phalacrocorax brasilianus*), northern harrier (*Circus cyaneus*), and yellow-billed cuckoo (*Coccyzus americanus occidentalis*) were not observed on Cannon AFB during the 2015–2016 surveys (CAFB 2016b). These species generally are uncommon in the region and their occurrence is unlikely (CAFB 2007, CAFB 2016b, Audubon 2018, NMDGF 2018b, NMDGF 2018c). The peppered chub (*Macrhybopsis tetranema*) is a state threatened species that is also under review for federal listing; however, its preferred habitats (shallow rivers and streams) are not present on Cannon AFB, and it is unlikely to occur on the installation (USFWS 2018b, NMDGF 2018c).

The burrowing owl is a federal species of concern that occurs on Cannon AFB. Burrowing owls are common in the disturbed grassland habitat. The burrowing owl population largely is dependent upon the black-tailed prairie dog population because they use their burrows for nesting, and they also can nest in badger and fox burrows. Cannon AFB follows USFWS guidance for protecting burrowing owls by marking burrows and protecting them from destruction (CAFB 2016b).

The lark bunting is a federal species of concern that could be present during the summer in the disturbed grassland habitat. The lark bunting was observed during the 2015–2016 surveys (CAFB 2016b).

The prairie falcon is a federal species of concern that could use the disturbed grassland habitat to hunt during the winter; however, there is no prairie falcon nesting habitat on Cannon AFB. The prairie falcon was observed during the 2015–2016 surveys (CAFB 2016b).

The long-billed curlew is a federal species of concern and a NMDGF SGCN that could use the urban and disturbed grassland habitats on Cannon AFB during the summer (CAFB 2016b, NMDGF 2018a). The long-billed curlew was not observed during the 2015–-2016 surveys but is known to occur on the installation (CAFB 2016b).

The black-tailed prairie dog is a NMDGF SGCN that is present on the installation. As of 2015, three active prairie dog towns were known to exist on Cannon AFB. Populations on Cannon AFB vary drastically from year to year with births, deaths, disease, and precipitation. They are considered a keystone species (i.e., a species that has a strong influence on an ecosystem) because many other animals use their burrows to escape extreme conditions.

**Table 3-16. State and Federally listed Species in Curry and Roosevelt Counties, New Mexico**

| Common Name<br>Scientific Name | Status | | Habitat Preference | Occurrence on Cannon AFB | Habitat Present near Project Areas | Occurrence on Melrose AFR | Habitat on Melrose AFR | Seasonal Presence |
|---|---|---|---|---|---|---|---|---|
| | USFWS (Federal) | FWC (State) | | | | | | |
| **Birds** | | | | | | | | |
| Arctic Peregrine Falcon<br>*Falco peregrinus tundrius* | - | T | Forested areas with cliffs and areas with abundant prey; hunt near croplands, meadows, marshes, and lakes | Unlikely | Yes | Unlikely | Yes | Winter |
| Baird's Sparrow<br>*Ammodramus bairdii* | - | T | Desert to upland grasslands | Unlikely | Yes | Unlikely | Yes | Winter |
| Bald Eagle***<br>*Haliaeetus leucocephalus* | SC | T | Large trees near or along rivers and lakes; hunts in plains and grasslands searching for carrion or prairie dog towns and near rivers, lakes, ponds, and reservoirs | Unlikely | Yes | Unlikely | Yes | Winter |
| Bell's Vireo***<br>*Vireo bellii* | SC | T | Thickets along streams or second growth shrubs, forest edges, and brush patches | Unlikely | Yes | Unlikely | Yes | Summer |
| Burrowing Owl***<br>*Athene cunicularia* | SC | - | Treeless areas with short vegetation within and adjacent to prairie dog colonies; nests only in prairie dog, badger, or fox burrows | Known to occur | Yes | Known to occur | Yes | Year-round |
| Golden Eagle**<br>*Aquila chrysaetos* | SC | - | Cliffs near open habitats; expansive dry and treeless grassland | Unlikely | No | Known to occur | Yes | Winter |
| Lark Bunting***<br>*Calamospiza melanocorys* | SC | - | Grasslands, short grass prairie, cultivated areas | Known to occur | Yes | Known to occur | Yes | Summer |
| Least Tern (interior population)***<br>*Sternula antillarum* | E | E | River sand bars and islands, ponds, lakes with gravel or sand bars, often surrounded by water | Unlikely | Yes | Unlikely | Yes | Summer |

| Common Name<br>Scientific Name | Status | | Habitat Preference | Occurrence on Cannon AFB | Habitat Present near Project Areas | Occurrence on Melrose AFR | Habitat on Melrose AFR | Seasonal Presence |
|---|---|---|---|---|---|---|---|---|
| | USFWS (Federal) | FWC (State) | | | | | | |
| Lesser Prairie-Chicken***<br>*Tympanuchus pallidicinctus* | UR | - | Arid natural grasslands with interspersed shrubs; normally found in habitat with shinnery oak | Unlikely | No | Known to occur | Yes | Year-round |
| Long-billed curlew***<br>*Numerius americanus* | SC | - | Shortgrass and mixed grass prairie, often within 0.25 miles of water; can be found in open fields and shores of freshwater lakes during migration | Known to occur | Yes | Known to occur | Yes | Summer |
| Neotropic Cormorant*<br>*Phalacrocorax brasilianus* | - | T | Often found on large bodies of water, expanse of open water is major attraction; nests on or over water in dead snags or trees | Unlikely | No | Unlikely | No | Year-round |
| Peregrine Falcon<br>*Falco peregrinus* | - | T | Cliffs in forested areas; hunt in areas near croplands, meadows, marshes, lakes and along building ledges with nearby abundant prey | Unlikely | Yes | Unlikely | Yes | Year-round |
| Prairie Falcon***<br>*Falco mexicanus* | SC | - | Low rock outcrops; vertical cliffs with sheltered ledges and loose debris or gravel for a nest scrape; old raptor nests; hunts in prairies, deserts, riverine escarpments, canyons, foothills, and mountains | Known to occur | Yes | Known to occur | Yes | Winter |
| Varied Bunting**<br>*Passerina versicolor* | - | T | Desert shrublands; dense stands of mesquite and associated growth in canyon bottoms | Unlikely | No | Unlikely | Yes | Summer |
| Whooping Crane**<br>*Grus americana* | E, EXP | E | Prairie potholes and riparian areas; forage in agricultural fields and pastures | Unlikely | Yes | Unlikely | Yes | Migration |

| Common Name Scientific Name | Status | | Habitat Preference | Occurrence on Cannon AFB | Habitat Present near Project Areas | Occurrence on Melrose AFR | Habitat on Melrose AFR | Seasonal Presence |
|---|---|---|---|---|---|---|---|---|
| | USFWS (Federal) | FWC (State) | | | | | | |
| Yellow-billed Cuckoo (eastern population)** *Coccyzus americanus occidentalis* | T | - | Open to dense stands of shrubs and low trees; nests in dense thickets near water and second growth woodlands | Unlikely | Yes | Unlikely | Yes | Summer |
| **Mammals** | | | | | | | | |
| Black-tailed Prairie Dog*** *Cynomys ludovicianus ludovicianus* | - | NM SGCN | Grassy plains and prairie ecosystems | Known to occur | Yes | Known to occur | Yes | Year-round |
| Least Shrew** *Cryptotis parva* | - | T | Dense ground cover in mesic habitats | Unlikely | No | Unlikely | Yes | Year-round |
| **Fish** | | | | | | | | |
| Peppered chub* *Macrhybopsis tetranema* | UR | T | Shallow rivers and streams with swift, turbulent, or laminar flows over sand or gravel bottoms | Unlikely | No | Unlikely | Yes | Year-round |
| **Reptiles** | | | | | | | | |
| Dunes Sagebrush Lizard** *Sceloporus arenicolus* | - | E | Sand dunes vegetated by shinnery oak or stands of low vegetation | Unlikely | No | Unlikely | Yes | Year-round |

Sources: USFWS 2008, Cornell 2017, CAFB 2016b, Audubon 2018, IMBCR 2018, NMDGF 2018b, NMDGF 2018c, NMDGF 2018e, USFWS 2018a, USFWS 2018b, USFWS 2019

* = listed in Curry County, ** = listed in Roosevelt County, *** = listed in both counties

Key: E = Endangered; T = Threatened; SC = Species of Concern (federal); C= Candidate; UR = Under Review; EXP = experimental; NM SGCN = New Mexico Species of Greatest Conservation Need

Unlikely = Little or no suitable habitat and no documented element occurrence between 2015 and 2016.

Likely = Potential suitable habitat exists or species observed on installation between 2015 and 2016.

***Migratory Birds.*** Various migratory birds protected under the MBTA have the potential to use Cannon AFB as a stopover on their migratory route or could occur year round (see **Table 3-17**) (CAFB 2016b, USFWS 2018a). The playa lakes provide important habitat for migratory birds because they attract waterfowl during migration and in winter and provide transient or seasonal habitat (CAFB 2007, CAFB 2016b).

### 3.6.2.2 NORTHEASTERN NEW MEXICO REGION

#### *Vegetation*

No ground disturbance would occur under the Proposed Action in the northeastern New Mexico region (i.e., Melrose AFR, beneath regional airspace, Ute Reservoir, or Conchas Lake). Therefore, vegetation in these areas would not be affected by the Proposed Action and is not discussed further.

#### *Wildlife*

***Melrose AFR.*** Over 100 wildlife species have been observed on Melrose AFR since 2014 (CAFB 2016b). Common species include the ornate box turtle (*Terrapene ornata ornata*),

**Table 3-17. Migratory Birds with Potential to Occur on Cannon AFB or Melrose AFR**

| Common Name | Scientific Name | Seasonal Occurrence |
|---|---|---|
| American Golden-Plover*** | *Pluvialis dominica* | Migrating |
| Arctic Peregrine Falcon*** | *Falco peregrinus tundrius* | Wintering |
| Bald Eagle*** | *Haliaeetus leucocephalus* | Wintering |
| Burrowing Owl*** | *Athene cunicularia* | Year-round |
| Cassin's Sparrow*** | *Aimophilia cassinii* | Breeding |
| Chestnut-collared Longspur*** | *Calcarius ornatus* | Wintering |
| Ferruginous Hawk*** | *Buteo regalis* | Wintering |
| Golden Eagle** | *Aquila chrysaetos* | Wintering |
| Lark Bunting*** | *Calamospiza melanocorys* | Breeding |
| Lewis Woodpecker*** | *Melanerpes lewis* | Wintering |
| Loggerhead Shrike*** | *Lanius ludovicianus* | Year-round |
| Long-billed Curlew*** | *Numenius americanus* | Breeding |
| McCown's Longspur*** | *Calcarius mccownii* | Wintering |
| Mountain Plover*** | *Charadrius montanus* | Breeding |
| Northern Harrier*** | *Circus cyaneus* | Wintering |
| Prairie Falcon*** | *Falco mexicanus* | Wintering |
| Red-headed Woodpecker*** | *Melanerpes erythrocephalus* | Breeding |
| Short-eared Owl** | *Asio flammeus* | Wintering |
| Snowy Plover*** | *Charadrius alexandrius* | Breeding |
| Solitary Sandpiper*** | *Tringa solitaria* | Migrating |
| Spague's Pipit*** | *Anthus spragueii* | Migrating |
| Swainson's Hawk** | *Buteo swainsoni* | Breeding |
| Williamson's Sapsucker*** | *Sphyrapicus thyroideus* | Wintering |
| Willow Flycatcher* | *Empidonax traillii* | Breeding |

* = could occur at Cannon AFB, ** = could occur at Melrose AFR, *** = could occur at both locations
Sources: Audubon 2018, Cornell 2017, CAFB 2016b, USFWS 2018a, NMDGF 2018c

western hognose snake (*Heterodon nasicus*), coachwhip (*Masticophis flagellum*), prairie lizard (*Sceloporus undulatus*), Texas horned lizard (*Phrynosoma cornutum*), mourning dove, common nighthawk (*Chordeiles minor*), western meadowlark (*Sturnella neglecta*), lark sparrow (*Chondestes gramacus*), horned lark (*Eremophila alpestris*), Cassin's sparrow (*Aimophilia cassinii*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail, silky pocket mouse (*Perognathus flavus*), northern grasshopper mouse (*Onychomys leucogaster*), Ord's kangaroo rat (*Dipodomys ordii*), coyote, pronghorn (*Antilocapra americana*), mule (*Equus asinus* × *Equus caballus*), and white-tailed deer (*Odocoileus virginianus*) (Parmenter et al. 1994, CAFB 2007, CAFB 2016b). Black-tailed prairie dog colonies are present on Melrose AFR and swift fox (*Vulpes velox*) may also be present on Melrose AFR (CAFB 2007, CAFB 2016b).

***Regional Airspace.*** The regional airspace considered (airspace covering areas above and between Cannon AFB, Melrose AFR, Ute Reservoir, and Conchas Lake; Taiban and Pecos MOAs; and IR-109) is associated with the High Plains ecoregion, Southwestern Tablelands ecoregion, and to a lesser extent the Chihuahuan Deserts ecoregion (Griffith et al. 2006). Cannon AFB, Melrose AFR, and Taiban MOA are within the High Plains ecoregion. Ute Reservoir and Conchas Lake are within the Southwestern Tablelands ecoregion. The Pecos MOA primarily extends into the High Plains and Southwestern Tablelands ecoregions, with a small area extending into the Chihuahuan Deserts ecoregion. IR-109 crosses through the High Plains and Southwestern Tablelands ecoregions. The New Mexico State Wildlife Action Plan considers the High Plains and Southwestern Tablelands ecoregions together as the South Central Semi-arid Prairie ecoregion because of their similarities (NMDGF 2016). Therefore, common species present throughout the regional airspace area are expected to be similar to those described for Cannon AFB and Melrose AFR.

***Ute Reservoir.*** Common terrestrial species to the Ute Reservoir area are similar to those described for Cannon AFB and Melrose AFR. Common fish species include sunfish (*Lepomis* spp.), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), and catfish (*Siluriformes* spp.) (NM EMNRD 2018).

***Conchas Lake.*** Common terrestrial species to the Conchas Lake area are similar to those described for Cannon AFB and Melrose AFR. Common fish species are similar to those described for Ute Reservoir (NM EMNRD 2018).

### *Protected Species*

***Melrose AFR.*** No federal or state-listed species permanently reside on Melrose AFR; however, some of these species have been observed in a transitory state (AFSOC 2014, CAFB 2016b). During a 2015–2016 survey for listed species, no federally or state-listed species were observed on the range, but several federal species of concern were observed. These species were the burrowing owl, golden eagle (*Aquila chrysaetos*), lark bunting, long-billed curlew, and prairie falcon (CAFB 2016b). There is no critical habitat on Melrose AFR (CAFB 2016b, USFWS 2018c).

The least tern is the only federally listed endangered species that could occur on Melrose AFR (see **Table 3-16**); however, they are unlikely to occur because they are uncommon in the region (Audubon 2018; NMDGF 2018e, USFWS 2018c, CAFB 2016b). The whooping crane (*Grus Americana*) population that could occur within Melrose AFR is a nonessential experimental

population (USFWS 2018c). Non-essential experimental populations are populations of threatened or endangered species that are being reestablished in their former range; however, the loss of these populations would not appreciably reduce the chances of the species' survival and they do not get the same protections as other federally listed species (USFWS 2016). There are also 14 federal species of concern, two state-listed threatened species, and one state-listed endangered species that could occur on Melrose AFR. These state-listed threatened (varied bunting [*Passerina versicolor*] and least shrew [*Cryptotis parva*]) and endangered (dunes sagebrush lizard [*Sceloporus arenicolus*]) species are not federal species of concern (see **Table 3-16**). The lesser prairie-chicken is under review for federal listing and considered for analysis while its status is being determined. Species with a potential to occur near the project areas are listed in **Table 3-16** and described further below.

The least tern has not been observed on Melrose AFR to date; however, the least tern could use Melrose AFR during its migration to regional breeding grounds to the southwest (CAFB 2007). In the unlikely event that the least tern is present on Melrose AFR, it could use the seasonal playas in the northeast and southwest portions of the range for foraging and nesting (CAFB 2016b).

The lesser prairie-chicken is under review for federal listing and is a NMDGF SGCN (NMDGF 2018d, USFWS 2018b). The shortgrass prairie and grassland habitats present on Melrose AFR provide suitable habitat for the lesser prairie-chicken (CAFB 2016b). The last confirmed sighting of lesser prairie-chicken on Melrose AFR was in 2012, and the species is currently considered to be absent from the range. However, annual monitoring efforts have continued (CAFB 2016b).

On Melrose AFR, burrowing owls can be found in grassland habitats where black-tailed prairie dog, badger, or fox burrows are present. Melrose AFR follows USFWS guidance for protecting burrowing owls by marking burrows and protecting them from destruction (CAFB 2016b).

The long-billed curlew and lark bunting are federal species of concern that could be present during the summer in the shortgrass prairie and grassland habitats of Melrose AFR (CAFB 2016b). The long-billed curlew is also a NMDGF SGCN (NMDGF 2018d). These species were observed during the 2015–2016 surveys at Melrose AFR (CAFB 2016b).

The golden eagle and prairie falcon are federal species of concern that were observed during the 2015–2016 surveys (CAFB 2016b). Melrose AFR provides suitable hunting and nesting habitat for all these species because it contains shortgrass prairie, grasslands, areas of woody vegetation, and canyons (CAFB 2016b, NMDGF 2018c). These species could be present on Melrose AFR during the winter (CAFB 2016b, Audubon 2018).

The black-tailed prairie dog is a NMDGF SGCN that is present on Melrose AFR (CAFB 2016b, NMDGF 2018d). As of 2014, there were a few small active prairie dog towns on Melrose AFR that were beginning to expand (AFSOC 2014).

Bald eagle and Bell's vireo are federal species of concern that were not observed on Melrose AFR during the 2015–2016 surveys (CAFB 2016b). These species are also state threatened (NMDGF 2018d, CAFB 2016b). These species generally are uncommon in the region and their

occurrence is unlikely (CAFB 2016b, Audubon 2018, NMDGF 2018c, NMDGF 2018e, CAFB 2007).

The dunes sagebrush lizard, a state-listed endangered species, was not observed on Melrose AFR during the 2015–2016 surveys (CAFB 2016b). The sand hills habitat adjacent to the northern boundary of the range provides suitable habitat for sand dune lizard; however, the species has not been detected during extensive wildlife surveys conducted on the range and its occurrence is unlikely (CAFB 2016b, CAFB 2007).

The state-listed threatened species varied bunting and least shrew were not observed on the Melrose AFR during the 2015–2016 surveys. The mesquite scrubland/grassland and canyon habitats provide suitable habitat for the varied bunting on Melrose AFR in the summer; however, it's uncommon in the region and its occurrence is unlikely (CAFB 2016b, Audubon 2018). Similarly, the least shrew could inhabit the shortgrass prairie or mesquite scrubland/grassland habitats on Melrose AFR, but its occurrence is also unlikely (CAFB 2016b).

***Regional Airspace.*** A variety of federally and state-listed species occur throughout the airspace and the land surface in the northeastern New Mexico region. A large proportion of the listed species are invertebrates, fish, and plants, which would not be expected to be impacted under the Proposed Action. Therefore, only federally and state-listed birds and mammals are considered because they could be affected by aircraft noise or strikes (see **Table 3-18**).

Federally listed bird species include the endangered least tern and southwestern willow flycatcher (*Empidonax traillii extimus*), the threatened Mexican spotted owl (*Strix occidentalis lucida*), and piping plover (*Charadrius melodus*). There is no critical habitat for these species present in the regional airspace (USFWS 2018d). While not identified by USFWS as potentially occurring within the regional airspace, the yellow-billed cuckoo (western population) is a federally listed threatened species that is listed in the counties in this area (Curry, Roosevelt, Chaves, De Baca, San Miguel, and Quay counties) (NMDGF 2018f). The least tern, southwestern willow flycatcher, and yellow-billed cuckoo (western population) could be in the region in the summer; however, they are uncommon (CAFB 2016b, Audubon 2018, USFWS 2018h). The Mexican spotted owl and Northern Aplomado falcon (*Falco femoralis septentrionalis*) are uncommon in the region during all seasons. The piping plover and whooping crane are uncommon in the region during their migrations (Audubon 2018).

Federally listed mammals include the endangered New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) and the candidate Penasco least chipmunk (*Tamias minimus atristriatus*). There is no critical habitat for these species in the regional airspace project areas (USFWS 2018d). Neither of these species has a record of occurrence in the counties associated with the regional airspace project areas (NMDGF 2018c).

A total of 15 state-listed birds and two mammals (that are not also federally listed) also could be present within the regional airspace (see **Table 3-18**). For the purposes of this analysis it is assumed that all the protected species discussed have the potential to occur within the regional airspace.

**Table 3-18. State and Federally listed Species in Curry, Roosevelt, Chaves, De Baca, San Miguel, and Quay Counties**

| Common Name | Scientific Name | Status | | Seasonal Occurrence |
|---|---|---|---|---|
| | | USFWS (Federal) | FWC (State) | |
| **Birds** | | | | |
| Arctic Peregrine Falcon | *Falco peregrinus tundrius* | - | T | Winter |
| Baird's Sparrow | *Ammodramus bairdii* | - | T | Winter |
| Bald Eagle | *Haliaeetus leucocephalus* | SC | T | Winter |
| Bell's vireo | *Vireo bellii* | SC | T | Summer |
| Boreal Owl | *Aegolius funereus* | - | T | Year-round |
| Broad-billed Hummingbird | *Cynanthus latirostris* | - | T | Year-round |
| Brown Pelican | *Pelecanus occidentalis* | - | E | Summer |
| Common Black Hawk | *Buteogallus anthracinus* | - | T | Summer |
| Common Ground Dove | *Columbina passerina* | - | E | Year-round |
| Gray Vireo | *Vireo vicinior* | - | T | Summer |
| Least Tern | *Sternula antillarum* | E | E | Summer |
| Mexican Spotted Owl | *Strix occidentalis lucida* | T | - | Year-round |
| Neotropic Cormorant | *Phalacrocorax brasilianus* | - | T | Year-round |
| Northern Aplomado Falcon | *Falco femoralis septentrionalis* | EXP | - | Year-round |
| Peregrine Falcon | *Falco peregrinus* | SC | T | Year-round |
| Piping Plover | *Charadrius melodus* | T | T | Migration |
| Southwestern Willow Flycatcher | *Empidonax traillii extimus* | E | E | Summer |
| Varied Bunting | *Passerina versicolor* | - | T | Summer |
| White-eared Hummingbird | *Hylocharis leucotis* | - | T | Year-round |
| White-tailed Ptarmigan | *Lagopus leucura* | - | E | Year-round |
| Whooping Crane | *Grus americana* | E, EXP | E | Migration |
| Yellow-billed Cuckoo (western population) | *Coccyzus americanus occidentalis* | T | - | Summer |
| **Mammals** | | | | |
| Least Shrew | *Cryptotis parva* | - | T | Year-round |
| Pacific Marten | *Martes caurina* | - | T | Year-round |

Sources: NMDGF 2018f, USFWS 2018d, CAFB 2016b, Audubon 2018, USFWS 2019
Key: E = Endangered; T = Threatened; C = Candidate; SC = Species of Concern (federal); UR = Under Review; EXP = Experimental

***Ute Reservoir***. Similar to regional airspace, not all listed species in the Ute Reservoir project area would be impacted by the Proposed Action; therefore, only federally and state-listed birds, mammals, and fish are considered. Fish are considered because training would occur within the reservoir, but benthic species are not considered because training would not disturb the reservoir floor or shores.

Federally listed species that could occur within the Ute Reservoir project area include the endangered least tern and the threatened Arkansas River shiner (*Notropis girardi*) (USFWS 2018e). While not identified by USFWS as potentially occurring within the Ute Reservoir project

area, the southwestern willow flycatcher is listed in Quay County where Ute Reservoir is located (NMDGF 2018g). While the Arkansas River shiner could occur in Ute Reservoir, it does not provide ideal habitat for the species. The species historically inhabited wide, shallow, sandy bottomed rivers and larger streams with stream flow sufficient for egg distribution and reproduction (USFWS 2011). There is no critical habitat for these species in the Ute Reservoir project area (USFWS 2018e).

State-listed bird species for Quay County (that are not also federally listed) include the endangered brown pelican (*Pelecanus occidentalis*) and common ground dove (*Columbina passerine*), as well as the threatened common black hawk (*Buteogallus anthracinus*), bald eagle, Arctic peregrine falcon, peregrine falcon, Baird's sparrow, and gray vireo (*Vireo vicinior*) (NMDGF 2018g). The brown pelican, common black hawk, and gray vireo could be in the region in the summer, but they are uncommon. The common ground dove is uncommon in the region during all seasons (Audubon 2018).

Also state-listed in Quay County is the threatened least shrew, threatened peppered chub, and endangered plain-bellied water snake (*Nerodia erythrogaster*). Based on the suitable habitat for the least shrew and peppered chub (see **Table 3-16**), these species are not likely to occur in the Ute Reservoir project area. The preferred habitat for the plain-bellied water snake is ponds, streams, and fairly large rivers; therefore, its occurrence at Ute Reservoir is unlikely (NMDGF 2018g).

***Conchas Lake.*** Similar to the Ute Reservoir project area, only federally and state-listed birds, mammals, and fish are considered for the Conchas Lake project area. Federally listed species that could occur in the Conchas Lake project area include the Mexican spotted owl, the southwestern willow flycatcher, and the New Mexico meadow jumping mouse (USFWS 2018f). While not identified by USFWS as potentially occurring within the Conchas Lake project area, the least tern, yellow-billed cuckoo (western population), and the Arkansas River shiner are listed in San Miguel County where Conchas Lake is located (NMDGF 2018g).

State-listed bird species for San Miguel County (that are not also federally listed) include the endangered brown pelican and white-tailed ptarmigan (*Lagopus leucura*) and the threatened, common black hawk, bald eagle, Arctic peregrine falcon, peregrine falcon, Baird's sparrow, gray vireo, boreal owl (*Aegolius funereus*), broad-billed hummingbird (*Cynanthus latirostris*), and white-eared hummingbird (*Hylocharis leucotis*) (NMDGF 2018h). The white-tailed ptarmigan, boreal owl, broad-billed hummingbird, and white-eared hummingbird are uncommon in the region during all seasons (Audubon 2018).

Also listed in San Miguel County are the threatened Pacific marten (*Martes caurina*) and suckermouth minnow (*Phenacobius mirabilis*). The Pacific marten primarily occurs in mature and densely forested areas; therefore, its occurrence near the Lake Conchas project area would be limited to densely forested areas along the shoreline. The suckermouth minnow typically inhabits small- to moderately sized clear water streams; therefore, its occurrence in Conchas Lake is unlikely (NMDGF 2018h).

#### *Migratory Birds*

***Melrose AFR.*** Similarly to Cannon AFB, various migratory birds protected under the MBTA have the potential to use Melrose AFR as a stopover on their migratory route or could occur year round (see **Table 3-17**) (USFWS 2018c, CAFB 2016b). The playa lakes on the range provide important habitat for migratory birds (CAFB 2016b, CAFB 2007).

***Regional Airspace, Ute Reservoir, and Conchas Lake.*** Over 30 migratory birds have the potential to use the regional airspace during migration. Ute Reservoir and Conchas Lake could be used as stopover points on migratory routes or as permanent habitat (USFWS 2018d, USFWS 2018e, USFWS 2018f). **Appendix D** provides a list of the migratory birds that could be present at these locations.

## 3.6.3 Environmental Consequences

### 3.6.3.1 COMPONENT ACTIONS AND ALTERNATIVES

#### *9th SOS MC-130J Aircraft Increase*

Short- and long-term, negligible to minor, adverse impacts would be expected on vegetation, wildlife, protected species, and migratory birds.

*Vegetation.* A paved or gravel parking lot near Buildings 4624 and 4605 (see **Figure 2-2**) would be constructed under this component action. Short-term, negligible, adverse impacts could occur if disturbance associated with construction activities results in the spread of nonnative or invasive species in vegetated areas. Soil disturbances could provide opportunities for nonnative and invasive species to establish or spread; however, the proposed project area would be covered by impervious surfaces and surrounded by maintained areas. As a result, invasive species or nonnative plants would have few opportunities to become established. The following BMPs could be implemented during and after construction to further prevent the establishment and spread of nonnative species:

- Inspect and clean construction equipment to remove soil, plants, and seeds.
- Ensure all fill is as free of nonnative plant propagules as is practicable.
- Re-vegetate disturbed areas with native plant species.

Invasive weeds would not be expected to become permanently established in disturbed areas with the proper implementation of these management practices. Additionally, BMPs would be implemented to minimize soil disturbance and control erosion and sedimentation during proposed activities to minimize potential impacts on adjacent vegetated areas.

Long-term, negligible, adverse impacts on disturbed grassland vegetation would be expected from its conversion to impervious surface. However, the project area has been previously disturbed and the surrounding areas of disturbed grassland habitat would remain; therefore, impacts would be negligible.

*Wildlife.* The increase in aircraft operations would result in increased use of Melrose AFR, Pecos MOA, Taiban MOA, and IR-109. Short-term, minor and long-term, negligible, adverse impacts on wildlife would be expected from an increase in aircraft noise and potential aircraft

bird/wildlife strikes. Short-term impacts would be greater than long-term impacts because of the temporary maximum increase in flight hours.

Impacts on wildlife from noise could occur due to the potential for aircraft noise to disturb wildlife and their behavior. The effects of noise on wildlife are mostly based on observations of behavioral responses. Animals rely on hearing for a variety of functions, including obtaining food, mating, and predator avoidance. Noise may mask or interfere with these functions. A general behavioral reaction by some wildlife species when exposed to noise is the startle response (e.g., flight, jumping, running, or movement of the head in the apparent direction of the noise source). Animal response to noise has been shown to vary with species; however, in general, human presence and natural predators more often caused startle responses than noise (Manci et al. 1988). While the increase in noise levels may cause some species to be temporarily startled, noise levels would not be sufficient to generate 65 dBA DNL noise contours at 300 feet AGL and would not be expected to adversely impact species survivability or reproduction. Additionally, birds and other wildlife have been documented to become habituated to aircraft overflights and other noises after continuous or frequent exposure. Therefore, species at Cannon AFB; Melrose AFR; and beneath the Pecos MOA, Taiban MOA, and IR-109 are likely habituated to some human activity and ambient noise because of the existing military activities, including the USAF aircraft operations that currently occur there (Larkin 1996). As a result, the noise impact on wildlife would result in short-term, minor and long-term, negligible impacts. To minimize potential noise impacts at night, low-level night flight timing would remain consistent with existing night activities.

BASH incidents primarily occur during takeoffs and landings (less than 100 feet AGL) with common bird species. BASH data from 1995 through 2016 indicate that USAF aircraft operations between 100 and 300 feet AGL accounted for approximately 5 percent of wildlife strikes, while USAF aircraft operations between 300 and 500 feet AGL accounted for approximately 3 percent of wildlife strikes (AFSC 2017). BASH incidents would be minimized to the greatest extent possible by following existing Cannon AFB and USAF BASH procedures and through use of the Aviation Hazard Advisory system, a radar system used to inform pilots of BASH hazards (AFSC 2018). Additionally, the Proposed Action would not create or enhance suitable habitat attractive to birds, and the nocturnal occurrence of the training flights limits the opportunity for aircraft and bird flights to coincide. Therefore, any change in BASH incidents throughout the 2018–2026 transition period would be negligible. A 14 to 18 percent increase in continued use of chaff and flares could also result in adverse impacts. The plastic caps from chaff and flares could be ingested by birds and other wildlife, causing blockages and other health problems that could lead to injury or potentially mortality.

Short- and long-term, negligible to minor, adverse impacts on wildlife would be expected from construction of the proposed 9th SOS parking lot expansion. Temporary impacts could result from the disturbance of wildlife by construction noise, resulting in escape or avoidance behaviors; however, these impacts would be temporary. Noise can also distort or mask bird communications signals (e.g., songs, warning calls, fledgling begging calls) and their ability to find prey or detect predators. If noise persists in a particular area, animals could leave their habitat and avoid it permanently. Resident wildlife species have likely habituated to high noise levels because of the proximity of the airfield and development (Larkin 1994). Long-term,

negligible, adverse impacts could occur from the mortality of small less mobile terrestrial species (e.g., reptiles, rodents, and small mammals) as a result of collision with construction equipment. Wildlife in the project areas would be expected to generally avoid the construction area. As a result, no population level effects would be expected to occur. Additional long-term, negligible, adverse impacts would result from the removal of approximately 0.7 acre of disturbed grassland habitat, although the parking lot could remain pervious. These impacts would be negligible due to the availability of similar habitat areas on and surrounding Cannon AFB.

*Protected Species*. Negligible effects on species listed under the ESA would be expected. No federally or state-listed species are known to be permanent residents of Cannon AFB. The federally listed species with the potential to occur at Cannon AFB or beneath Pecos MOA, Taiban MOA, and IR-109 (the endangered least tern and southwestern willow flycatcher and the threatened Mexican spotted owl and piping plover) are not expected to occur and are uncommon to the project areas. Similarly, the occurrence of state-listed species at Cannon AFB or beneath Pecos MOA, Taiban MOA, and IR-109 (see **Tables 3-16** and **3-18**) is unlikely because these species are uncommon to the project areas. In the event that a protected species is within one of the project areas, they would likely be habituated to aircraft noise because military flights currently occur there. Further, the least tern does not have suitable habitat in proximity to the proposed parking lot on Cannon AFB.

Effects from increases in aircraft noise and potential aircraft strikes on federal species of concern could be similar to those described for wildlife if they are present within affected existing airspace. While the occurrence of these species is unlikely, some have been previously observed on Cannon AFB (see **Table 3-16**) and could be present beneath Pecos MOA, Taiban MOA, and IR-109. However, potential impacts on these species would be negligible and would not be expected to adversely impact species survivability or reproduction.

Should any federal species of concern or state-listed species be sighted during construction of the parking lot, personnel should cease activities, report the sighting to the Cannon AFB Natural Resources Program Manager, and allow the species sufficient time to move away from the project area on its own before resuming activities. Burrowing owls would be protected in accordance with the USFWS guidance followed by Cannon AFB (CAFB 2016b). If encountered, burrowing owls would be relocated to suitable habitat available on the installation by a qualified biologist. Cassin's sparrow, lark bunting, and long-billed curlew nests would be avoided if discovered during construction. If construction would occur in the summer, surveys for these species should be completed prior to starting these activities as appropriate. The prairie falcon would be transient if present within the project area because of the lack of suitable nesting habitat on Cannon AFB. Surveys for black-tailed prairie dog and swift fox burrows would be conducted throughout the project area as appropriate prior to construction, and if any burrows are found, the species inhabiting them would be relocated if required.

*Migratory Birds*. Impacts on migratory birds from aircraft noise and potential aircraft strikes would be similar to those described for wildlife if these species are present within the project area. Long-term, negligible, adverse impacts on migratory birds could occur due to the loss of disturbed grassland habitat from the construction of the parking lot. However, migratory birds would be expected to relocate to similar adjacent habitats readily available on and surrounding

Cannon AFB. Additionally, the following BMPs would be implemented to avoid impacts on migratory birds that could be present on Cannon AFB during construction:

- If construction is scheduled to start during the period when migratory birds are present, a site-specific survey for nesting migratory birds should be performed starting at least 2 weeks prior to site clearing.
- If nesting birds are found during the survey, buffer areas should be established around nests. Construction should be deferred in buffer areas until birds have left the nest and confirmation that all young have fledged should be made by a qualified biologist.
- Steps should also be taken to prevent migratory birds from establishing nests in the project area. These could include covering equipment and structures and use of various excluders (e.g., noise).

### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

Long-term, negligible, adverse impacts would be expected on wildlife, protected species, and migratory birds due to the increase in RPA training from 17 to 30 hours per week to and from Melrose AFR. Impacts on wildlife, protected species, and migratory birds at Cannon AFB and Melrose AFR would result from increased aircraft noise and potential aircraft strikes. These impacts would be similar to, but lesser than, those described for the 9th SOS MC-130J Aircraft Increase. No construction would occur under this component action; therefore, no on-the-ground impacts on vegetation, wildlife, protected species, or migratory birds would be expected under this action.

### *16th SOS Upgrade of the AC-130W to AC-130J*

Long-term, negligible to minor, adverse impacts would be expected on wildlife, protected species, and migratory birds. The increase in aircraft operations under this component action would result in increased use of Pecos MOA, Taiban MOA, and IR-109. Adverse impacts on wildlife, protected species, and migratory birds would be expected from an increase in aircraft noise and potential aircraft bird/wildlife strikes. These impacts would be similar to those described for the 9th SOS MC-130J Aircraft Increase. No construction would occur under this component action; therefore no on-the-ground impacts on vegetation, wildlife, protected species, or migratory birds would be expected under this action.

### *27th SOSS Water Safety Training Upgrades*

Long-term, negligible to minor, adverse impacts would be expected on wildlife, protected species, and migratory birds, as noted below.

*Ute Reservoir (Preferred Alternative).* Impacts expected from an increase in aircraft noise and potential aircraft strikes would be similar to, but less than, those described for the 9th SOS MC-130J Aircraft Increase. Military aircraft operations do not currently occur over the lake. Although noise levels from CV-22 aircraft flight operations could temporarily be greater than 65 dBA, due to the short-term nature of the activity noise levels would not be sufficient to generate 65 dBA DNL noise contours at 500 feet AGL. The maximum noise level would only be experienced briefly at the closest point of approach with noise level rising and falling as the aircraft fly over the reservoir. While aquatic species could be disturbed by training activities in the water, Ute

Reservoir is an active recreational area and wildlife in the area are habituated to human activity. Additionally, the use of 6 to 12 swimmers and associated boats would not be expected to result in mortality of fish species. The continued use of the approved dye markers, which contain up to a maximum of 1 percent insoluble materials, up to two times a month to identify locations of swimmers would not adversely affect fish and wildlife because it would dilute quickly in a lake the size of Ute Reservoir. The dye markers contain sodium fluorescein, which has been demonstrated safe to use in low quantities such as dye markers, has low toxicity risk, breaks down easily in sunlight, and is already used to detect lesions on fish. The risk the dye in these concentrations poses to wildlife is minimal (Walthall and Stark 1999, Stockton et al. 2011). Impacts on fish and wildlife from continued boat exhaust during SERE exercises would be very negligible given the infrequency of boat use and when compared with ongoing recreational boat use on the reservoir.

Negligible, adverse effects on federally or state-listed species would be expected. The federally listed species with the potential to occur at Ute Reservoir include the endangered least tern and southwestern willow flycatcher, and the threatened Arkansas River shiner. Multiple state-listed species could also be present in the project area. All listed species are uncommon in the project area or suitable habitat for the species is not present; therefore, their occurrence is unlikely. In the unlikely event that these species are present in the project area, impacts from noise and potential aircraft strikes would be negligible.

*Conchas Lake Alternative.* Impacts would be similar to those described for Ute Reservoir. In addition to the least tern, southwestern willow flycatcher, and Arkansas River shiner, the federally listed Mexican spotted owl, yellow-billed cuckoo (western population), and New Mexico meadow jumping mouse could occur within the project area. Multiple state-listed species could also be present in the project area. All listed species are uncommon in the project area or suitable habitat for the species is not present; therefore, their occurrence is unlikely. In the unlikely event that these species are present in the project area, impacts from noise and potential aircraft strikes would be negligible.

### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* Impacts on vegetation, wildlife, protected species, and migratory birds would be similar to, but greater than, those described for the parking lot construction under the 9th SOS MC-130J Aircraft Increase component action.

Vegetation. Short-term, negligible, adverse impacts could occur if disturbance associated with construction results in the spread of nonnative or invasive species in vegetated areas. Although the project area is not immediately surrounded by other areas of urban vegetation, BMPs described for the 9th SOS MC-130J action could be implemented during and after construction to prevent the establishment and spread of nonnative species. Long-term, negligible, direct adverse impacts on approximately 0.3 acres of urban habitat vegetation would be expected from its conversion to an impervious surface. However, the project area has been previously disturbed and the nearby areas of urban and disturbed grassland habitat would remain; therefore, impacts would be negligible.

Wildlife. Short- and long-term, minor, adverse impacts on wildlife would be expected from construction. Short-term impacts could result from the disturbance of wildlife by construction

noise, resulting in escape or avoidance behaviors; however, these impacts would be temporary. Long-term impacts could occur from the mortality of small less mobile terrestrial species (e.g., reptiles, rodents, and small mammals) as a result of collision with construction equipment. However, wildlife in the project areas would be expected to generally avoid the construction area. As a result, no population level impacts would be expected to occur. Additional long-term, minor, adverse impacts would result from the removal of urban habitat. These impacts would be minor due to the availability of similar habitat areas on and surrounding Cannon AFB.

Protected Species. No effects on species listed under the ESA would be expected. No federally or state-listed species are known to be permanent residents of Cannon AFB. The federally listed species with the potential to occur at Cannon AFB (the endangered least tern) is not expected to occur and is uncommon to the installation. Additionally, the least tern does not have suitable habitat proximate to the Foxtrot simulator construction area on Cannon AFB. Similarly, the occurrence of state-listed species at Cannon AFB is unlikely because these species are uncommon to the area. Impacts from construction activities on federal species of concern could be similar to those described for wildlife if they are present within the project areas. Should any federal species of concern or state-listed species be sighted during construction of the Foxtrot simulator, personnel should cease activities, report the sighting to the Cannon AFB Natural Resources Program Manager, and allow the species sufficient time to move away from the project area on its own before resuming activities.

Migratory Birds. Long-term, negligible, adverse impacts on migratory birds would occur similar to those discussed for wildlife above.

*Building 4675 Expansion Alternative.* Impacts on vegetation, wildlife, protected species, and migratory birds would be similar to, but slightly greater than, those described for the construction of the Foxtrot simulator at Building 724 described above. While this alternative would require 1,000 $ft^2$ less disturbance, it would occur in disturbed grassland habitat with a greater potential for the spread of invasive species and the presence of wildlife, federal species of concern, and migratory birds. No impacts on the least tern or state-listed species would be expected for the reasons described for Building 724 above.

### *27th SOMXS Munitions Storage Area Upgrades*

Impacts on vegetation, wildlife, protected species, and migratory birds would be similar to, but greater than, those described for the parking lot construction under the 9th SOS MC-130J Aircraft Increase component action.

*Vegetation*. Short-term, minor, adverse impacts could occur if disturbance associated with demolition and construction results in the spread of nonnative or invasive species in vegetated areas. However, BMPs described for the 9th SOS MC-130J action could be implemented during and after construction and demolition to prevent the establishment and spread of nonnative species. Although the project area has largely been previously disturbed, long-term, minor, adverse impacts on approximately 0.7 acre of urban habitat vegetation would be expected from its conversion to impervious surfaces.

*Wildlife.* Short- and long-term, minor, adverse impacts on wildlife would be expected from demolition and construction. Impacts could result from the disturbance of wildlife by construction noise, resulting in escape or avoidance behaviors; however, these impacts would be temporary. Long-term impacts could occur from the mortality of small less mobile terrestrial species (e.g.,

reptiles, rodents, and small mammals) as a result of collision with construction equipment. However, wildlife in the project areas would be expected to generally avoid the construction area. As a result, no population level effects would be expected to occur. Additional long-term impacts would result from the removal of urban habitat. These impacts would be minor due to the availability of similar habitat areas on and surrounding Cannon AFB.

*Protected Species*. No effects on species listed under the ESA would be expected. No federally or state-listed species are known to be permanent residents of Cannon AFB. The federally listed species with the potential to occur at Cannon AFB (the endangered least tern) is not expected to occur and is uncommon to the installation. Although the only suitable habitat for the least tern on the installation is immediately south of the project area at North Playa Lake, no demolition or construction would occur in this area and no potential habitat would be removed or disturbed. Similarly, the occurrence of state-listed species at Cannon AFB is unlikely because these species are uncommon to the area. Impacts from construction on federal species of concern could be similar to those described for wildlife if they are present within the project areas. Should any species of concern or state-listed species be sighted during demolition or construction, personnel should cease activities, report the sighting to the Cannon AFB Natural Resources Program Manager, and allow the species sufficient time to move away from the project area on its own before resuming activities.

*Migratory Birds*. Long-term, negligible, direct adverse impacts on migratory birds could occur due to the loss of urban habitat from demolition and construction. However, migratory birds would be expected to relocate to similar adjacent habitats readily available on and surrounding Cannon AFB. Additionally, BMPs would be implemented to avoid impacts on migratory birds that could be present on Cannon AFB during demolition and construction.

#### 3.6.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Short- and long-term, negligible to minor, adverse impacts would be expected on vegetation, wildlife, protected species, and migratory birds. Ground disturbing activities could have temporary, negligible, adverse impacts on vegetation if disturbance associated with construction results in the spread of nonnative or invasive species in vegetated areas. However, BMPs could be implemented during and after construction and demolition to further prevent the establishment and spread of invasive species. Long-term, negligible, adverse impacts on disturbed grassland vegetation would be expected from its conversion of approximately 1.7 acres to impervious surfaces.

Short-term, minor and long-term, negligible, adverse impacts on wildlife would be expected from an increase in aircraft noise, potential aircraft bird/wildlife strikes, and an increase in continued use of chaff and flares. Impacts on wildlife could occur due to the potential for aircraft noise to disturb wildlife and their behavior. While the increase in noise levels may cause some species to be temporarily startled, noise levels would not be sufficient to generate 65 dBA DNL noise contours at 300 feet AGL and would not be expected to adversely impact species survivability or reproduction. Short- and long-term, negligible, adverse impacts on wildlife would be expected from the construction of the proposed parking lot. Temporary impacts could result from the disturbance of wildlife by construction noise, resulting in escape or avoidance behaviors. Long-term impacts could occur from the mortality of small, less mobile terrestrial species (e.g., reptiles, rodents, and small mammals) as a result of collision with construction equipment. However, wildlife in the project areas would be expected to generally avoid the construction

area. Additional long-term, negligible, adverse impacts would result from the removal of disturbed grassland habitat.

Negligible adverse effects on species listed under the ESA would be expected from increases in aircraft noise and potential aircraft strikes if they are present within the project areas, but the presence of listed species is uncommon. Potential impacts on these species would not be expected to adversely impact species survivability or reproduction. Cannon AFB submitted a letter to USFWS with a "may affect, not likely to adversely affect" finding on listed species (see **Appendix A**).

#### 3.6.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, no new impacts would occur because the realignment of aircraft and personnel and associated increase in training and infrastructure improvements would not be implemented. The existing conditions discussed in **Section 3.6.2** would remain unchanged.

## 3.7 Cultural Resources

### 3.7.1 Definition of Resource

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

Several federal laws and regulations govern protection of cultural resources, including the NHPA of 1966, the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). Cannon AFB is required to comply with USAF regulations and instructions regarding cultural resources, including AFI 32-7065, *Cultural Resources Management*, and Cannon AFB's Integrated Cultural Resources Management Plan (CAFB 2017b). Cannon AFB consults with federally recognized tribes in accordance with the laws listed previously, as well as EO 13175, DoD Instruction 4710.02, and AFI 90-2002 identified in **Section 1.3.2**.

The NHPA establishes criteria for assessing the significance of cultural resources. Resources that are listed or eligible for listing in the National Register of Historic Places (NRHP) are termed "historic properties." Generally, cultural resources must be more than 50 years old to warrant consideration for the NRHP. More recent resources might warrant listing if they are of exceptional importance or if they have the potential to gain significance in the future. Section

106 of the NHPA requires federal agencies to assess the potential impact of their undertakings on historic properties in the area of potential effect (APE). Cannon AFB is consulting under Section 106 of the NHPA with the New Mexico SHPO and appropriate federally recognized tribes. As a part of the Section 106 process, Cannon AFB has defined the undertaking as the Proposed Action and has defined the APE as the facility project areas for component actions where demolition, renovation, expansion, or new construction would have potential to affect historic properties: the 9th SOS MC-130J Aircraft Increase; the 551st SOS Expansion of Flight Simulators; and the 27th SOMXS Munitions Storage Area Upgrades. These areas total 219,130 $ft^2$ (5.0 acres) and are shown in **Figure 3-7** and represents the APE. The remaining component actions do not have the potential to affect historic properties as they consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces.

## 3.7.2 Affected Environment

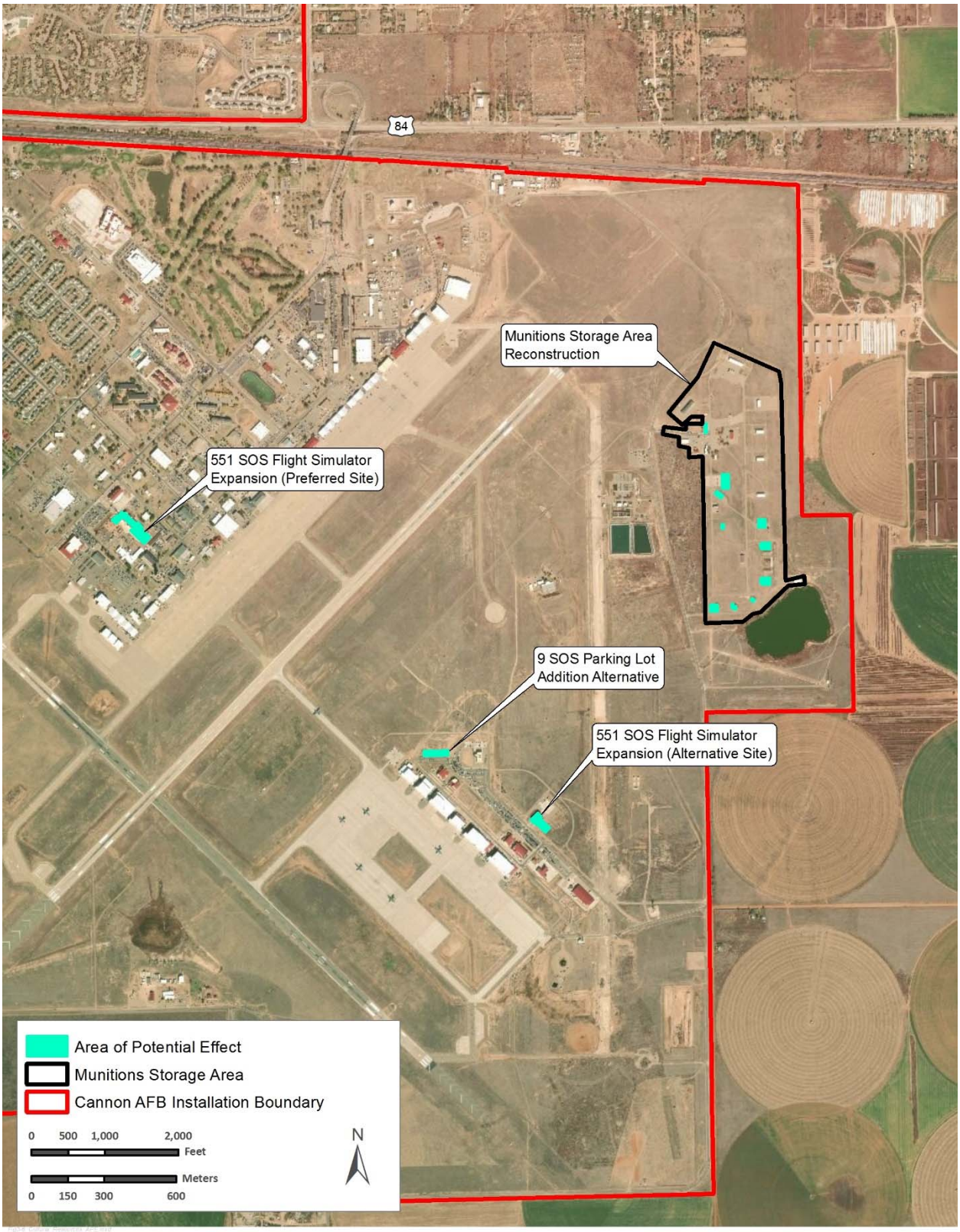
### 3.7.2.1 CANNON AFB

Cannon AFB is on the western edge of the Llano Estacado in eastern New Mexico, where humans history spans over 12,000 years. Archaeologists have developed the following chronology for the period before contact with Europeans: the Paleo-Indian period (10550 B.C. to 550 B.C.), the Archaic period (5500 B.C. to A.D. 900), and the Ceramic period (600/900 A.D. to 1550 A.D.) (CAFB 2017b). When the Spanish first explored the region around Cannon AFB in 1541, it was home to various Apache groups and a group Francisco Vasquez de Coronado referred to as the Teyas, possibly the Jumanos (CAFB 2017b). The Comanche began to establish themselves in the region in the 1700s, clashing with the Apache as well as the Spanish and Puebloans who used the area to hunt buffalo and gather other resources.

The history of Cannon AFB begins with the construction of what was originally known as Portair Field at Clovis in 1929. The airfield became Army Air Base, Clovis, New Mexico, in 1942 and was re-designated Clovis Army Air Field in 1945.

Several archaeological surveys have been completed at Cannon AFB, including surveys in 1987, 1994, 2012, 2014, and 2015 (CAFB 2017b). Parts of the installation that have not been surveyed are typically heavily disturbed areas within the airfield and cantonment area that are not likely to contain archaeological sites. Previous surveys have identified two prehistoric archaeological sites and four historic archaeological sites at Cannon AFB (CAFB 2017b). Two historic sites are recommended eligible for NRHP listing and the remaining four sites are recommended not eligible. No archaeological sites have been identified within the APE.

Architectural inventories of Cannon AFB were completed in 1994, 2004, 2005, and 2006 that, taken together, evaluated all buildings on the installation constructed from pre-World War II through the Cold War (pre-1991). In 2006, an installation-wide architectural inventory evaluated or reevaluated all buildings constructed before 1991 for their eligibility for listing in the NRHP. The inventory recommended only one architectural resource on the installation as eligible for NRHP listing, a flagpole designated as Building 2. Building 2 is outside the APE and approximately 600 feet from the nearest part of the APE at Building 724 (CAFB 2017b).




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 3-7. Cultural Resources Area of Potential Effect**

Five federally recognized tribes have an expressed or potential interest in Cannon AFB cultural resources: the Comanche Tribe of Oklahoma, the Apache Tribe of Oklahoma, the Jicarilla Apache Tribe, the Mescalero Apache Tribe, and the Kiowa Tribe of Oklahoma. Cannon AFB consults with these tribes on issues related to cultural resource management, the unanticipated discovery of human remains and cultural items under the Native American Graves Protection and Repatriation Act, and on project-specific effects under Section 106 of the NHPA. To date, these tribes have not identified any sacred sites or traditional cultural properties on the main installation. Cannon AFB has invited these tribes to consult on the Proposed Action.

#### 3.7.2.2 NORTHEASTERN NEW MEXICO REGION

Component actions that would occur outside of Cannon AFB would not have potential to impact cultural resources because no ground disturbance would occur in those locations, existing airspaces would not change, and impacts from noise would be negligible (see **Section 3.1.3**). Therefore, the greater Northeastern New Mexico Region beyond Cannon AFB is not part of the affected environment for cultural resources.

### 3.7.3 Environmental Consequences

#### 3.7.3.1 COMPONENT ACTIONS AND ALTERNATIVES

##### *9th SOS MC-130J Aircraft Increase*

USAF's proposal to increase the number of MC-130J aircraft operated by the 9th SOS would have no impact on cultural resources. The action would have the potential to impact cultural resources during construction of the proposed parking lot; however, no archaeological resources have been identified at the proposed site. The area is previously disturbed from construction of adjacent buildings, and it is unlikely there are unidentified archaeological resources that could be affected. Similarly, no architectural or traditional resources are within the proposed parking area.

##### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

The proposed 12th SOS increase in MQ-9 RPA personnel would have no impact on cultural resources. The increase would not require any changes in infrastructure or facilities, and no ground disturbing activities or building modification, demolition, or construction would occur.

##### *16th SOS Upgrade of the AC-130W to AC-130J*

The proposed 16th SOS upgrade of the AC-130W to AC-130J would have no impact on cultural resources. The upgrade would not require any changes in infrastructure or facilities, and no ground disturbing activities or building modification, demolition, or construction would occur.

##### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* The addition of an aerial component to the 27th SOSS SERE water safety training at Ute Reservoir would have no impact on cultural resources. The training would occur in existing airspace and would not involve ground disturbing activities.

*Conchas Lake Alternative.* The addition of an aerial component to the 27th SOSS SERE water safety training at Conchas Lake would have no impact on cultural resources. The training would occur in existing airspace and would not involve ground disturbing activities.

### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* The Building 724 Expansion alternative would have no impact on cultural resources. No archaeological resources have been identified in the proposed construction area, which is previously disturbed. Therefore, ground disturbance during construction of the Building 724 expansion would have no impact. Building 724 is a modern facility, and proposed renovations and construction of the expansion would have no impact on historic architecture. The expansion would represent an incremental change to a modern building in an active installation and would not have visual impacts on architectural resources, including Building 2, a flagpole approximately 600 feet from Building 724. No resources of traditional or religious significance have been identified in the proposed disturbance area and no impacts are expected.

*Building 4675 Expansion Alternative.* The Building 4675 Expansion alternative would have no impact on cultural resources. No archaeological resources have been identified in the proposed construction area, which is previously disturbed. Therefore, ground disturbance during construction of the Building 4675 expansion would have no impact. Building 4675 was constructed in 2015, is not historic, and expansion of the building to accommodate the new simulator facility would have no impact on architectural resources. No resources of traditional or religious significance have been identified in the proposed disturbance area and no impacts are expected.

### *27th SOMXS Munitions Storage Area Upgrades*

Proposed upgrades to the 27th SOMXS munitions storage area would have no impact on cultural resources. No archaeological resources have been identified in proposed disturbance areas, which are previously disturbed from building construction. Six buildings in the munitions storage area are more than 50 years old and were evaluated as not eligible for listing in the NRHP (CAFB 2017b). Therefore, proposed demolition and construction would have no impact on architectural resources. No resources of traditional or religious significance have been identified in proposed disturbance areas and no impacts are expected.

## 3.7.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Three of the component actions would have no impact on cultural resources: the 12th SOS Increase in MQ-9 Reaper RPA Personnel; the 16th SOS Upgrade of the AC-130W to AC-130J; and the 27th SOSS Water Safety Training Upgrades. These activities would not involve ground disturbance, building modifications or construction, or other activities with the potential to affect cultural resources and were not included in the APE.

The remaining component actions (the 9th SOS MC-130J Aircraft Increase; the 551st SOS Expansion of Flight Simulators; and the 27th SOMXS Munitions Storage Area Upgrades) would involve ground disturbance, construction of new facilities, and the demolition or renovation of existing buildings and would have potential to affect cultural resources. However, no historic properties were identified in these project areas. Although six buildings in the 27th SOMXS munitions storage area are older than 50 years, these were previously determined not eligible for listing in the NRHP. Proposed project areas associated with these three component actions are previously disturbed and unidentified archaeological or traditional resources are not expected. New aboveground construction would occur in the context of an active installation

and would not cause visual intrusion affecting historic properties on the installation. Should unidentified historic properties or human remains be encountered during the Proposed Action, Cannon AFB would follow the procedures for inadvertent discoveries provided in the installation's Integrated Cultural Resources Management Plan.

As part of Cannon AFB's consultation under Section 106 of the NHPA, the installation determined the undertaking would have no effect on historic properties as none are within the APE. Cannon AFB consulted with the New Mexico SHPO and has received their concurrence with this determination. Cannon AFB is also consulting with five Native American tribes with interest in the Cannon AFB area, and has received one response from these tribes to date (see **Appendix A**).

#### 3.7.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, none of the component actions that comprise the Proposed Action would be implemented. Ground disturbance associated with new construction and building renovations, expansions, and demolitions would not occur, and there would be no impacts on cultural resources.

## 3.8 Hazardous Materials and Wastes

### 3.8.1 Definition of Resource

Hazardous materials are generally characterized as any item or agent that has the potential to pose a risk, through physical or chemical reactions, to human health or the environment, either by itself or through interaction with other factors. Hazardous materials are defined in 49 CFR § 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions."

Generally, hazardous wastes are discarded solids or liquids that are ignitable, corrosive, reactive, or toxic. Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) as: "a solid waste or combination of solid wastes, which because of its quantity, concentrations or physical, chemical or infectious characteristics may (A) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating irreversible illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed." The treatment, storage and disposal of hazardous wastes are regulated under RCRA.

Toxic substances are substances that might pose a risk to human health and are addressed separately from other hazardous substances. USEPA is given authority to regulate these substances, including asbestos-containing materials (ACMs), lead-based paint (LBP), and polychlorinated biphenyls (PCBs), under the authority of the Toxic Substances Control Act (15 USC § 53). Federal regulations regarding asbestos abatement and worker safety are found under 40 CFR § 763, with additional regulations concerning emissions at 40 CFR § 61. The disposal of LBP waste, whether from abatement or other activities, is regulated by RCRA at 40 CFR § 260. Disposal of PCBs is regulated in 40 CFR §§ 750 and 761. Air Force guidance for

toxic substances management is provided in AFI 32-1052, *Facility Asbestos Management*, and AFI 32-7042, *Waste Management*.

The Defense Environmental Restoration Program (ERP) was established by the Superfund Amendments and Reauthorization Act of 1986 to facilitate thorough investigation and cleanup of contaminated sites on military installations (i.e., active installations, installations subject to Base Realignment and Closure, and Formerly Used Defense Sites). The Installation Restoration Program (IRP) and Military Munitions Response Program (MMRP) are components of the ERP. The IRP requires DoD installations to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination.

AFI 32-7086, *Hazardous Materials Management*, established procedures and standards that govern the management of hazardous materials throughout USAF to be in compliance with the Emergency Planning and Community Right-to-Know Act. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials and to those who manage, monitor, or track any of those activities. Under AFI 32-7086, USAF has established roles, responsibilities, and requirements for a hazardous materials management program. The program controls the procurement and use of hazardous materials to support USAF missions, ensures the safety and health of personnel and surrounding communities, and minimizes USAF dependence on hazardous materials. The Cannon AFB Hazardous Materials Program Manager is responsible for the overall management of the hazardous materials program on the installation.

Concerns associated with hazardous materials and wastes typically center around waste streams; storage tanks; and the storage, transport, use and disposal of pesticides, fuels, lubricants, and other industrial substances. When such materials are used or not disposed of properly, they can threaten the health and well-being of wildlife species, habitats, soil and water systems, and humans. Overall management of hazardous materials, hazardous wastes, and toxic substances for USAF is covered in Air Force Policy Directive 32-70, *Environmental Quality*, and Air Force Regulation 32-7000 series, which incorporate the requirements of all federal regulations and other AFIs and DoD Directives.

## 3.8.2 Affected Environment

### 3.8.2.1 CANNON AFB

***Hazardous Materials and Petroleum Products.*** Aircraft flight operations and maintenance and installation maintenance at Cannon AFB require the storage and use of many types of hazardous materials and petroleum products. These materials include fuels, lubricants, acids, hydraulic fluids, corrosives, caustics, glycols, compressed gases, aerosols, batteries, solvents, paints, and pesticides.

Storage of petroleum products occurs throughout Cannon AFB. There are 61 ASTs at the installation ranging in size from a 250-gallon AST used to contain fuel for a pump engine to an 840,000-gallon AST used for jet petroleum. All ASTs are provided with secondary containment and most fuel transfers occur on paved surfaces to minimize the potential for impacts on natural

resources in the event of a spill. Two 1,000-gallon ASTs used to provide propane for the heating boiler in Building 2110 (proposed for demolition) are to the south of the building. Three 10,000-gallon gasoline underground storage tanks are located at the installation's fuel service station (CAFB 2016b).

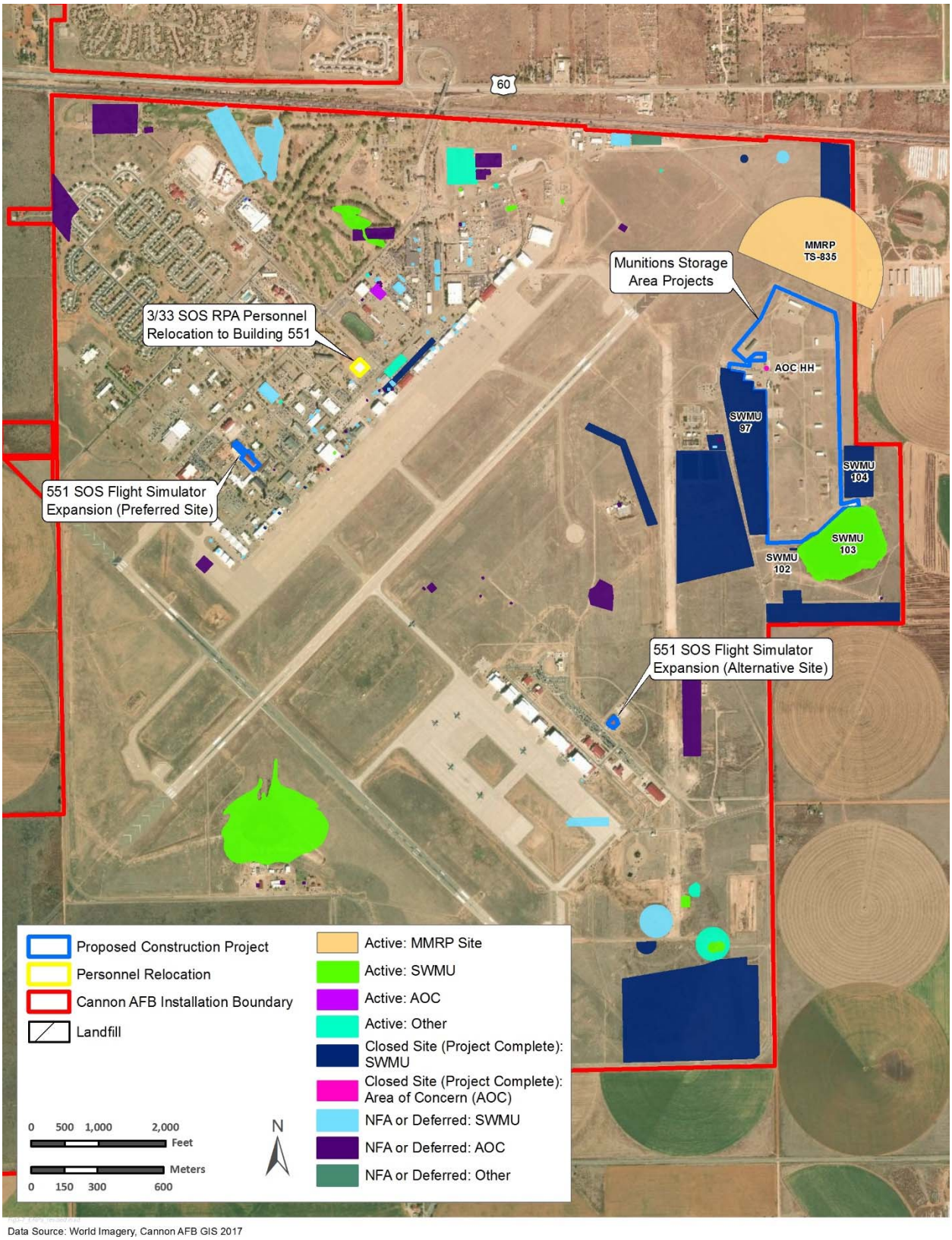
The Cannon AFB Spill Prevention and Response Plan addresses proper handling procedures of all hazardous materials to minimize potential spills and releases. It also outlines activities to be undertaken to minimize the adverse effects of a spill, including notification, containment, decontamination, and cleanup of spilled materials (CAFB 2017c).

***Hazardous and Petroleum Wastes.*** Cannon AFB maintains a Hazardous Waste Management Plan as directed by AFI 32-7042. The plan describes the roles and responsibilities of all entities at Cannon AFB regarding the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention, and establishes the procedures to comply with federal, state, local, and USAF hazardous waste management requirements (CAFB 2017d).

Cannon AFB is an RCRA large quantity generator of hazardous waste and operates under USEPA identification number NM7572124454 (NMED 2017). Cannon AFB has 120 collection points, 75 initial accumulation points, and one 90-day accumulation point for hazardous waste (CAFB 2016b). No hazardous wastes or used petroleum products are stored in the project areas.

***Environmental Restoration Program.*** Cannon AFB initiated its ERP in 1983, and in 1987 applied for a RCRA Part B permit to store hazardous waste, thereby triggering a RCRA Facility Assessment. The assessment identified 179 solid waste management units (SWMUs) and areas of concern (AOCs). Cannon AFB is no longer designated a hazardous waste treatment, storage, and disposal facility; therefore, its RCRA Part B permit is classified as "corrective action only" for the investigation and potential remediation of the identified SWMUs and AOCs as administered by the NMED. Currently, 9 ERP sites are Active and require corrective action, 141 ERP sites are closed to Response Complete (closed with controls), and 29 ERP sites are closed to Site Closure (unrestricted use/unrestricted exposure). Seven of the closed to Response Complete sites are landfills that undergo yearly inspections and maintenance as required. As part of the permit requirements, Cannon AFB conducts a biennial groundwater monitoring program at 18 groundwater monitoring wells (CAFB 2016b).

The ERP sites near the project areas are shown in **Figure 3-8**. ERP site AOC HH (Storage Tank No. 2110) is within the munitions storage area, and ERP sites SWMU 97 (Landfill #25), SWMU 102 (wastewater treatment facility effluent discharge), SWMU 103 (North Playa Lake), and SWMU 104 (Landfill #4) are adjacent to the munitions storage area. AOC HH is the location of a former a 550-gallon diesel fuel tank just south of Building 2110 that was removed in 1996. No contamination has been identified for this site and it is identified as Site Closure. SWMU 97 is closed as Response Complete with yearly inspections and maintenance as required, SWMU 102 is closed as Response Complete with land use controls and inspections, SWMU 103 is Active and requires corrective action, and SWMU 104 is closed as Response Complete with yearly inspections and maintenance as required. There are no MMRP sites within or adjacent to




Data Source: World Imagery, Cannon AFB GIS 2017

**Figure 3-8. ERP Sites and Component Action Project Areas.**

the project areas. Active MMRP site TS-835 is over 1,200 feet north of the closest project area within the munitions storage area (CAFB 1997, CAFB 2016d).

***Toxic Substances.*** PCBs are no longer manufactured in the U.S. and use of most ACMs and LBP has been phased out except for specialty applications. However, facilities constructed prior to the general discontinued use of these substances (i.e., 1978 for LBP and PCBs and 1990 for ACMs) are more likely to contain them. Based on their age, there is the potential for some of the buildings proposed for demolition and expansion to contain ACM, LBP, and PCBs. Cannon AFB's Hazardous Waste Management Plan and Civilan Contractor Environmental Guide provide guidance for the identification and management of ACMs, LBP, and PCBs (CAFB 2016, CAFB 2017d). The design of building alteration projects and requests for self-help projects are reviewed by Cannon AFB to determine if ACMs and other toxic substances are present in the proposed work area. When necessary, these substances are removed by contractors and disposed of in accordance with state and federal regulations (CAFB 2007).

***Radon.*** The on-the-ground project areas are on Cannon AFB in Curry County. According to the USEPA Radon Zone Map, Curry County is in Radon Zone 2, which is a moderate zone with a range of 2 to 4 picocuries per liter in indoor air. USEPA has a radon guidance level of 4 picocuries per liter in indoor air for residences; however, there have been no standards established for nonresidential structures.

#### 3.8.2.2 NORTHEASTERN NEW MEXICO REGION

***Munitions and Range Residue.*** Munitions used at Melrose AFR include ammunition expended during air-to-ground and ground-to-ground training towards the range's impact area and defensive chaff and flares. However, residual chaff and flares do not release chemicals in potentially dangerous concentrations. Expending chaff and flares is achieved in conjunction with ground/aircraft radar while performing evasive maneuvers. These activities take place in approved MOAs or in Restricted Airspace. The minimum MOA altitude for flare use under less than very high fire danger is 2,000 feet AGL (CAFB 2007, AFSOC 2016).

Use of training flares, where approved within Cannon AFB-managed airspace, incorporates the following management practices:

- The minimum altitude for flare release in SUA is 2,000 feet AGL (flares burn out after falling approximately 400 feet).
- When the National Fire Danger Rating System indicates high fire conditions or above, the minimum altitude for flare release is raised to above 5,000 feet AGL.
- USAF maintains a record of chaff and flare usage within the training airspace.
- USAF establishes and maintains a method whereby chaff or flare materials found on private property can be identified for safety risk and removed to ensure safety.
- USAF cooperates with local agencies for mutual aid response to fires.
- USAF will continue an education program for fire departments beneath the airspace to include information on flares.

***Hazardous Materials and Petroleum Products.*** Jet fuel and other similar products are used during aircraft operations. Gasoline and oil are used in boats at Ute Reservoir State Park for water safety training.

## 3.8.3 Environmental Consequences

### 3.8.3.1 COMPONENT ACTIONS AND ALTERNATIVES

#### *9th SOS MC-130J Aircraft Increase*

This component action would result in an end state increase of 2 aircraft and 67 personnel as well as a 48 percent increase in aircraft training, which would bring a corresponding increase in the use of materials including fuel, oils, and countermeasures (chaff and flares). Training activities would increase by a maximum of two flights per night. On-installation fuel capacity to support the increase in aircraft and training already exists. A permanent increase in the use of hazardous materials and the generation of hazardous wastes and used petroleum products would be expected from the addition of aircraft and associated operations, resulting in long-term, negligible, adverse impacts on hazardous materials and waste. Hazardous materials used for maintaining and operating aircraft include jet fuel and a variety of lubricants, solvents, adhesives, sealants, and paints typical for maintaining and operating aircraft, which are not expected to change. Materials used during parking lot construction would include construction vehicle fuel and lubricants. The installation and contractors would be able to accommodate the demand for these materials.

#### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

The proposed increase in personnel would result in an increase in aircraft training and use of hazardous materials such as fuel and oils. On-installation fuel capacity to support the increase in aircraft training already exists. A permanent increase in the use of hazardous materials and the generation of hazardous wastes and used petroleum products would be expected to result in long-term, negligible, adverse impacts on hazardous materials and wastes.

#### *16th SOS Upgrade of the AC-130W to AC-130J*

Based on the increase of aircraft end state and flying hours (33 percent increase for both), a similar increase in aircraft training and countermeasures simulation and munitions usage during training would be expected. The same number of crew would operate the updated aircraft; however, the increase in operations would increase the use of fuel and other hazardous materials associated with maintaining and operating aircraft. Therefore, long-term, negligible, adverse impacts on hazardous materials would be expected on hazardous materials and wastes. The types of hazardous materials used for maintaining and operating aircraft would not be expected to change.

#### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* This alternative would include the use of CV-22s to drop rubber rafts and swimmers into Ute Reservoir and the use of safety boats on Ute Reservoir, which would require the increased use of fuels, lubricants, and other hazardous materials. As a result, long-term, negligible, adverse impacts from the use and generation of hazardous materials and wastes would be expected.

*Conchas Lake Alternative.* Impacts would be similar to the Ute Reservoir alternative.

#### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* Under this alternative, there is the potential for exposure to LBP, ACMs, and PCBs during restoration of the simulator bay that is currently used for storage in Building 724, so a survey for these toxic substances and their removal as required would occur. The renovation and construction would require the short-term use of hazardous materials and the generation of hazardous wastes and used petroleum products. No long-term impacts on hazardous materials would be expected.

*Building 4675 Expansion Alternative.* Impacts would be similar to the Building 724 Expansion alternative.

#### *27th SOMXS Munitions Storage Area Upgrades*

Under this component action, new buildings would be constructed and outdated Buildings 2110, 2122, 2125, 2126, 2127, and 2143 would be demolished. There is the potential for exposure to LBP, ACMs, and PCBs during building demolition, so a survey for these toxic substances and their removal as required would occur. Demolition and construction would require the short-term use of hazardous materials and the generation of hazardous wastes and used petroleum products. The two propane ASTs at Building 2110 would be removed during demolition of the building. ERP site AOC HH would be tested as appropriate to verify there is no residual contamination at the site. No long-term impacts on hazardous materials would be expected.

### 3.8.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Short- and long-term, negligible, adverse impacts on hazardous materials and wastes would occur under the Proposed Action. Short-term impacts would result from the use of hazardous materials and petroleum products during construction and demolition. The increased quantities of these materials would be negligible and their use would be temporary. Contractors would be responsible for the management of hazardous materials and petroleum products and generation of hazardous wastes, which would be handled in accordance with federal, state, and local regulations. The equipment used during construction and demolition could result in spilled hazardous materials; however, such spills would be immediately contained and remediated in accordance with the installation's Spill Prevention and Response Plan. Long-term impacts would result from an increase in fuel and oil consumption and hazardous materials use from additional aircraft training and maintenance. However, the existing installation fuel system and hazardous materials pharmacy would be able to handle the increase. The increase in the generation of hazardous wastes and used petroleum products would not be expected to affect installation management plans or capacities for handling these materials.

The Proposed Action would have no impact on the installation's ERP. No ground disturbing components of the proposed projects would impact any of the ERP sites or MMRP sites. All groundwater monitoring wells would be avoided during demolition and construction.

Short-term, negligible, adverse impacts associated with LBP, ACMs, and PCBs could occur during the demolition and expansion phase of the Proposed Action. These impacts could result from exposure to and disposal of LBP, ACM, and PCB wastes. All buildings that have not

already been surveyed would be surveyed for these materials prior to demolition or expansion. If abatement is required, it would be conducted in accordance with federal, state, and USAF regulations. No impacts from radon would be expected. Radon encountered during excavation would disperse quickly into the atmosphere and likely not present a health risk to construction personnel.

The Proposed Action would result in negligible, adverse impacts from the increase in range residue associated with the increased use of chaff, flares, and munitions during training. The use of chaff, flares, and munitions would result in the generation of negligible quantities of plastic and metal debris from the expended countermeasures and munitions. The use of chaff, flares, and munitions would continue to be conducted in accordance with existing management practices.

#### 3.8.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. No changes in the use, storage, or disposal of hazardous materials and wastes would occur when compared to existing conditions. Therefore, no new impacts on hazardous materials and waste management would occur.

## 3.9 Health and Safety

### 3.9.1 Definition of Resource

In general, a safe environment is one in which the potential for death, serious bodily injury, illness or property damage is reduced to the maximum extent practicable. Human health and safety addresses health and safety for the public and on-site employees, including construction contractors and USAF personnel, during construction and demolition as well as operations and training activities. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself along with an exposed (and potentially susceptible) population.

Site safety is achieved by following regulatory requirements imposed for the benefit of employees and the public that aim to reduce risks of illness, injury, death and property damage. OSHA ensures safe and healthy working conditions by setting and enforcing standards and by providing health and safety training, outreach, education, and assistance. The health and safety of on-site military and civilian employees are also safeguarded by numerous DoD and USAF regulations designed to comply with the standards issued by OSHA. These include the amount and type of safety training required for workers, the use of personal protective equipment (PPE), administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

Air Force Occupational Safety and Health (AFOSH) policies and regulations developed to protect civilian and contract employees associated with USAF activities include AFI 91-202 and Air Force Manual 91-203, *Air Force Occupational Safety, Fire, and Health Standards*. AFI 91-202 “establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information.” To meet the goals of minimizing the loss of USAF resources and protecting military personnel, the USAF mishap prevention program addresses groups at increased risk for mishaps, injury, or illness; implements a

process for tracking incidents; provides funding for safety programs; provides safety goals; and provides methods to identify safety BMPs and measure overall safety performance (AFSOC 2016).

### 3.9.2 Affected Environment

***Construction Safety***. All personnel involved with USAF activities on Cannon AFB are responsible for following ground safety regulations and workers compensation programs and are required to avoid risk to workers or personnel. Construction contractors are responsible for reviewing all potentially hazardous workplace operations, monitoring exposure to workplace chemicals such as ACMs and LBP, and mitigating for physical hazards such as noise exposure and biological agents. Industrial hygiene programs address exposure to hazardous materials, use of PPE, and availability of Safety Data Sheets to ensure personnel are properly protected. Construction personnel must also ensure a medical surveillance program is in place to perform occupational health physicals for workers subject to accidental chemical exposures.

***Operations Safety***. Safety staff at all levels assist with implementation and integration of operational risk management in all USAF operations and missions. The USAF host and tenant safety offices are responsible for implementing AFI 91-202 and the Wing Safety Office implements mishap prevention programs at Cannon AFB. Detailed standard operating procedures fulfill many health and safety requirements and personnel are instructed on the proper use of equipment and PPE. Surface danger zones at Melrose AFR are delineated for all small arms and explosives ranges to protect personnel operating inside and outside those ranges while they are active (CAFB 2018). Melrose AFR follows AFI 13-212 at the two active impact areas for direct fire explosive munitions training (AFSOC 2016).

AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, implements Air Force Policy Directive 91-2, *Safety Programs,* by outlining the AFOSH Program for USAF personnel safety. The purpose of the AFOSH Program is to minimize the loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing safety risks. In conjunction with the USAF Mishap Prevention Program described previously, these standards ensure all USAF workplaces meet federal safety and health requirements. This instruction applies to all USAF activities. AFI 13-212 outlines the management procedures for ranges at USAF installations. In addition to other objectives, this instruction provides guidance on how to operate ranges safely.

The AICUZ program is designed to provide USAF installations and surrounding communities with guidelines to address safety and noise issues. Cannon AFB and Melrose AFR provide for compatible uses in areas subject to noise and aircraft accident hazards such as clear zones (CZs) and accident potential zones (APZs). These designations encourage compatible development around the airfield to provide for the health, safety, and welfare of people potentially exposed to aircraft noise and airfield hazards (CAFB 2017a, CAFB 2018).

Explosive safety clearance zones are established around all facilities used for storage, handling or maintenance of munitions to safeguard military and civilian communities. The size of explosive safety clearance zones is established in Air Force Manual 91-201, *Explosives Safety Standards*. ESQD arcs have been established to ensure that minimum safety distances are

present where explosions may occur. The Cannon AFB Equipment Maintenance Squadron's Munitions Flight controls, maintains, and stores all ordnance and munitions required for mission performance. The 27th SOMXS operates and manages the munitions storage area in the northeastern corner of the installation. Munitions stockpiled in these facilities support 12 flying squadrons, Melrose AFR, the 26 Special Tactics Squadron, explosive ordnance disposal, aircrew flight equipment, and a variety of additional activities. Ordnance is handled and stored in accordance with USAF safety directives and all munitions handling is carried out by trained, qualified personnel. Currently, several facilities in the munitions storage area are obsolete and inefficiently storing munitions. The storage area requires several explosive safety waivers due to the re-designation of East Aderholt Loop from low to medium traffic status and the addition of new infrastructure around the munitions storage area.

## 3.9.3 Environmental Consequences

### 3.9.3.1 COMPONENT ACTIONS AND ALTERNATIVES

***9th SOS MC-130J Aircraft Increase***

The increase in personnel, training activities, and aircraft operations would result in negligible impacts on health and safety due to the risk of accidents and other issues associated with aircraft operations training. Existing health and safety programs, compliance with OSHA standards and strict adherence to best practices would minimize risk. Training activities would increase by a maximum of two flights per night. To minimize potential noise impacts at night, low-level night flight timing would remain consistent with existing night activities. On-installation infrastructure and fuel capacity to support the increase in aircraft already exists, so no fuel system upgrades would be required. The AICUZ program is designed to provide USAF installations and surrounding communities with guidelines to address safety and noise issues. Through the AICUZ program, USAF has designated areas around Cannon AFB and Melrose AFR, including CZs and APZs, to avoid incompatible uses in areas subject to noise and aircraft accident hazards. These designations encourage compatible development around the airfield and provides for the health, safety, and welfare of people potentially exposed to aircraft noise and airfield hazards (CAFB 2017a, CAFB 2018). Impacts on airspace and aircraft safety are discussed in **Section 3.3.3**.

Short-term, negligible, adverse impacts on health and safety from construction of the new parking lot near Buildings 4624 and 4605 would occur. Short-term safety risks associated with construction would increase during the construction of the new parking lot. Contractors would be responsible for complying with standard operating procedures and health and safety regulations during construction. Ground disturbance would occur outside of active ERP sites, so the likelihood of construction contractors encountering contaminated soils is low.

Workers would be required to wear PPE such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Health and safety during construction for non-construction-related personnel would be maintained through administration or engineering controls such as construction barriers and warning posters and signs. Equipment and associated trucks transporting material to and from the construction site would be directed to roads and streets that can safely accommodate these vehicles. Negligible, adverse impacts on

health and safety would occur due to current implementation of health and safety programs, compliance with OSHA standards, and strict adherence to best practices.

### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

The MQ-9 Reaper RPA mission at Cannon AFB would be expanded with additional aircrews. The total proposed increase of 25 personnel would be accompanied by an increase in training activities, resulting in use of additional materials (e.g., fuel and lubricants). No additional supporting infrastructure would be required because the necessary space, parking, and utilities to accommodate the total increase of 25 personnel under this component action already exists on the installation. No impacts on health and safety would occur from the increase in personnel and training activities due to current implementation of health and safety programs, compliance with OSHA and AFOSH standards, and strict adherence to best practices.

### *16th SOS Upgrade of the AC-130W to AC-130J*

Four additional AC-130J aircraft would realign to Cannon AFB and the increase in aircraft would include a corresponding increase in flying hours and countermeasures and munitions use. In addition to the safety reasons discussed for the 9th SOS above, the improved alignment of resources, advancement in weapons and targeting systems, and additional training hours would improve overall health and safety because aircrews would be more efficient and better trained. Therefore, no impacts on health and safety would occur due to current implementation of health and safety programs, compliance with OSHA and AFOSH standards, and strict adherence to best practices.

### *27th SOSS Water Safety Training Upgrades*

The CV-22 approach would deliver combat rubber raiding craft and swimmers into the water. A safety boat would accompany all live water operations (day and night). This boat would be in position near the training location prior to initiating live water operations. CV-22s would not land at the State Park, and no HLZ is proposed. Impacts on health and safety would be minimized by adhering to safety policies and procedures.

*Ute Reservoir (Preferred Alternative).* Under this alternative, the 27th SOSS SERE training mission would be supplemented by using CV-22 aircraft for “low and slow” and “hoist and release” training at Ute Reservoir. Training at Ute Reservoir would be conducted both day and night at times when the park has the fewest visitors during the workweek (typically Tuesday). The expected frequency of water training operations, which includes existing training and the proposed water training, would be two daytime sorties per month and four nighttime sorties per month. Cannon AFB would coordinate with New Mexico State Parks regarding water training activities. CV-22s conducting water operations would fly patterns between 500 and 100 feet AGL toward the south side of the reservoir to avoid populated areas. CV-22 operations and noise from the aircraft would result in short-term, minor, adverse impacts on health and safety of park visitors. Water safety training would use sites free of obstructions and away from park visitors and vessels. Policies and procedures for health and safety, including the operation of safety boats, would be followed.

*Conchas Lake Alternative.* Under this alternative, water safety training using CV-22s would occur at Conchas Lake, which is an additional 5 minutes flight time longer than for Ute

Reservoir and additional driving time for the safety boat operators from Cannon AFB. Impacts would the same as described for the Ute Reservoir alternative.

#### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* The addition of 9th SOS and 3/33rd SOS personnel to the installation requires additional training in simulators, which would require construction of an additional simulator (Foxtrot) and 11 additional training and support personnel. In addition, one existing simulator bay (Echo) that is currently used for storage would be restored to active simulator use. Short-term safety risks would increase during construction. Contractors would be responsible for complying with standard operating procedures and health and safety regulations during construction. Therefore, negligible impacts on health and safety would be expected.

*Building 4675 Expansion Alternative.* A simulator would instead be constructed at Building 4675. Impacts would be the same as the Building 724 alternative.

#### *27th SOMXS Munitions Storage Area Upgrades*

Short-term, minor, adverse impacts on health and safety would be expected from the proposed demolition, construction, and renovation within the munitions storage area. The short-term safety risks associated with construction would increase during demolition and construction. Safety hazards would include risks associated with handling ammunition and other ordnance and potential exposure to ACM and LBP during demolition. Contractors would be responsible for complying with standard operating procedures and health and safety regulations during construction and demolition.

The modern facilities would allow for more efficient storage of munitions and result in long-term, beneficial impacts on health and safety. The planned upgrades and construction within the munitions storage area would eliminate the need for a traffic safety waiver. Safety measures would be implemented as required in Air Force Manual 91-201. These upgrades would also remove storage restrictions, allow for more efficient munitions storage, reduce security risks, reconfigure the public traffic route safety arc so it no longer crosses East Aderholt Loop, and move Building 2127 out of the floodplain, which would keep stored ammunition from being damaged due to flooding.

### 3.9.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

The Proposed Action would have short-term, minor, adverse impacts on health and safety during demolition and construction from potential exposure to ACM, LBP, and typical construction and demolition health and safety issues. Long-term, beneficial impacts on health and safety would be anticipated with construction of new facilities designed to specifically support the needed mission-related activities. Although demolition and construction pose an increased risk to health and safety, construction personnel would comply with all USAF and OSHA-related regulations and policies.

Under the Proposed Action, an increase in aircraft would result in an increase in personnel, mission activity, use of materials such as fuel, and flying hours. This increase would result in negligible impacts on health and safety due to accident risk. Continued implementation of the

existing health and safety programs, compliance with OSHA and AFOSH standards, adherence to the AICUZ program recommendations, and strict use of best practices would lower the risk levels. New personnel would be trained accordingly, and current flight paths would be followed where safety and noise concerns have been previously addressed, thereby resulting in overall negligible impacts on health and safety.

#### 3.9.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, several potentially adverse impacts on health and safety would continue to occur. The ESQD public traffic route safety arc would continue to overlap East Aderholt loop. There would continue to be a risk of flooding in outdated munitions storage structures that overlap designated floodplains. Personnel would continue to work in buildings not intended for their current use and a lack of training space would reduce the available training hours for current personnel.

## 3.10 Socioeconomics and Recreation

### 3.10.1 Definition of Resource

Socioeconomics is the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these fundamental socioeconomic indicators typically result in changes to additional socioeconomic indicators such as housing availability and the provision of public services. Socioeconomic data at local, county, regional, and state levels permit characterization of baseline conditions in the context of regional and state trends.

Demographics, employment characteristics, and housing occupancy status data provide key insights into socioeconomic conditions that might be affected by a proposed action. Demographics identifies the changes in population levels of a region over time. Demographics data also identify a region's characteristics in terms of race, ethnicity, poverty status, and other broad indicators. Data on employment characteristics identify gross numbers of employees, employment by industry or trade, income levels, and unemployment trends. Housing statistics allow evaluation of the impacts a proposed action might have upon housing in the region. In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and influence in the job market.

Socioeconomic data shown in this section are presented at census tract, county, and state levels to characterize baseline socioeconomic conditions in the context of regional and state trends.

Recreational resources include areas and infrastructure designated by federal, state, and local planning entities to offer visitors and residents diverse opportunities to enjoy leisure activities. Recreational resources can range from being natural and relatively undisturbed areas to being highly developed sites with permanent infrastructure.

## 3.10.2 Affected Environment

### 3.10.2.1 CANNON AFB

Cannon AFB is in rural eastern New Mexico, 7 miles southwest of Clovis near the Texas border. For the purposes of this socioeconomic analysis, three different spatial levels are used:

1. Census Tract 9, which encompasses only the installation
2. Curry County, New Mexico
3. State of New Mexico.

Census Tract 9 best illustrates socioeconomic characteristics for Cannon AFB and where most impacts from the Proposed Action would be expected because it fully encompasses the installation. Curry County is considered the region of influence (ROI) because most of the construction workers and supplies for the construction activities associated with the Proposed Action would likely come from the nearest residential and developed areas within the county. State data is provided for comparison.

***Demographics.*** All of the spatial levels show an increase in population between 2010 and 2016 as presented in **Table 3-19**. The greatest population increase trend occurred in Census Tract 9.

**Table 3-19. Population Data for Spatial Levels in 2010 and 2016**

| Area Analyzed | Population | |
|---|---|---|
| | 2010 | 2016 |
| Census Tract 9 | 2,245 | 2,701 |
| Curry County (ROI) | 48,376 | 50,544 |
| New Mexico | 2,059,181 | 2,082,669 |

Sources: USCB 2010, USCB 2016a
Note: Numbers presented in the 2016 population column are based on estimates from the American Community Survey. The 2016 data represent 5-year estimates from 2012 to 2016 and are intended to provide a more precise estimate of current conditions.

***Employment Characteristics.*** As of 2016, Census Tract 9 had 50.8 percent of the workforce (more than 16 years old and in the labor force) employed in the armed forces. This is considerably more than the other spatial levels but expected because of the presence of Cannon AFB. In contrast, 8.3 percent of the labor force in Curry County and 0.9 percent in New Mexico were employed in the armed forces. Public administration was the industry that employed the highest percentage of the population in Tract 9 and the educational, health, and social services industry was the most common employer of Curry County and New Mexico (USCB 2016b). **Table 3-20** presents complete information regarding employment by industry. The unemployment rate is 13.8 percent in Census Tract 9, 8.9 percent in Curry County, and 8.5 percent in New Mexico (USCB 2016b). The employment rates by area and type are also presented in **Table 3-20**.

Economic growth in the county is heavily reliant on Cannon AFB, which has historically been the largest employer. According to the Curry County Comprehensive Plan, as the largest employer in the county, Cannon AFB personnel support the retail, accommodation, and food services

**Table 3-20. Employment Characteristics Percentages by Industry for 2012 to 2016**

| Employment Type | Census Tract 9 | Curry County (ROI) | New Mexico |
|---|---|---|---|
| Population 16 Years and Over in the Labor Force[1] | 1,595 | 24,344 | 966,377 |
| Percent of population 16 years and over in labor force employed within the armed forces | 50.8% | 8.3% | 0.9% |
| **Percent Employed Persons 16 Years Old and Over in Civilian Labor Force (by industry)** | | | |
| Agriculture, forestry, fishing and hunting, and mining | 0% | 6.0% | 4.2% |
| Construction | 0.9% | 7.3% | 6.9% |
| Manufacturing | 0.9% | 5.3% | 4.5% |
| Wholesale trade | 4.7% | 2.0% | 2.1% |
| Retail trade | 1.5% | 11.8% | 11.4% |
| Transportation and warehousing, and utilities | 5.0% | 8.8% | 4.4% |
| Information | 0% | 1.3% | 1.5% |
| Finance, insurance, real estate, and rental and leasing | 1.8% | 3.3% | 4.6% |
| Professional, scientific, and management, and administrative and waste management services | 1.9% | 5.9% | 11.2% |
| Educational, health, and social services | 17.1% | 22.5% | 25.4% |
| Arts, entertainment, recreation, accommodation, and food services | 9.2% | 8.9% | 11.2% |
| Other services (except public administration) | 7.2% | 5.2% | 4.9% |
| Public administration | 49.8% | 11.7% | 7.6% |

Source: USCB 2016b
[1]Labor force includes persons that are employed or unemployed civilians and members of the armed forces.
Note: Numbers presented are percentages based on estimates from the 2012–2016 ACS 5-year estimates.

industries, as well as real estate and educational services. The installation employs 4,189 military personnel and 533 civilian personnel. In 2013, the total economic impact of the installation was worth an estimated $688 million (approximately $262.3 million in annual payroll, $40.8 million in local job creation, and $385 million in local expenditures) (Curry County 2018). Cannon AFB created 1,888 indirect jobs valued at $73.4 million in 2015 (MyBaseGuide 2017).

***Housing Characteristics.*** In 2016, the U.S. Census Bureau reported there were 789 housing units in Census Tract 9. Of these, 52 were vacant, resulting in a 6.6 percent vacancy rate. There were only three owner-occupied units in Census Tract 9, or 0.4 percent of all occupied units, while the remaining 99.6 percent were renter-occupied units. In 2016, the U.S. Census Bureau reported that there were 20,685 housing units in Curry County. Of these units, 2,388 were vacant, resulting in an 11.5 percent vacancy rate. Owner-occupied units in Curry County totaled 10,786 units, or 58.9 percent of all occupied units, while the remaining 41.1 percent were renter-occupied units (USCB 2016c).

***Recreation.*** No notable recreation areas are near the proposed project sites on the installation.

### 3.10.2.2 NORTHEASTERN NEW MEXICO REGION

Portions of northeastern New Mexico, outside of Cannon AFB, where activities associated with the Proposed Action may occur include Melrose AFR, Taiban and Pecos MOAs, Ute Reservoir, and Conchas Lake. However, the Proposed Action does not include an increase in personnel or any construction activities in these areas; therefore, impacts on the local economy from

increases in construction-related payroll taxes, sales receipts, and the indirect purchase of goods and services would not occur. As a result, socioeconomics are not discussed further for this region. Ute Reservoir and Conchas Lake both have state parks (Ute Lake State Park and Conchas Lake State Park) used for public recreation activities such as boating, fishing, camping, and picnicking. As stated in **Section 2.3.4**, Cannon AFB currently has an agreement with Ute Lake State Park to use park boat ramps to conduct SERE activities.

## 3.10.3 Environmental Consequences

### 3.10.3.1 COMPONENT ACTIONS AND ALTERNATIVES

#### *9th SOS MC-130J Aircraft Increase*

No adverse impacts on the socioeconomic environment at Cannon AFB are expected from the proposed increase in personnel, aircraft, and flying hours. As stated in **Section 2.3.1**, current accommodations on the installation would sufficiently house and support the additional personnel. Construction of a new parking lot adjacent to the 9th SOS Squadron Operations Facility would incur limited temporary payroll tax revenue and purchase of materials benefiting the local economy.

The increase in approximately 139 personnel would result in a long-term, minor, beneficial impact on the socioeconomic environment in the local area from increased payroll tax revenue and the purchase of goods and services in the local area. It is expected the installation and local area could provide the available housing to accommodate any increased demand from the increase in personnel.

#### *12th SOS Increase in MQ-9 Reaper RPA Personnel*

No adverse impacts on the socioeconomic environment at Cannon AFB are expected from the proposed increase in personnel. As stated in **Section 2.3.2**, no additional supporting infrastructure would be required for the additional personnel.

The increase in approximately 25 personnel would result in a long-term, minor, beneficial impact on the socioeconomic environment in the local area from increased payroll tax revenue and the purchase of goods and services in the local area.

#### *16th SOS Upgrade of the AC-130W to AC-130J*

No adverse impacts on the socioeconomic environment at Cannon AFB are expected from the proposed addition of 5 AC-130J aircraft and reconfiguration of 12 AC-130W aircraft currently stationed at the installation to AC-130J aircraft. No additional personnel or construction would be necessary for this portion of the Proposed Action.

#### *27th SOSS Water Safety Training Upgrades*

*Ute Reservoir (Preferred Alternative).* Long-term, minor, adverse impacts on the socioeconomic environment and public use of Ute Reservoir would be expected from the proposed aerial component associated with upgrades of water safety training. Established coordination and procedures outlined in the 2007 Cannon AFB Assets EIS would continue to be implemented to ensure minimal adverse impacts on the public's use of this recreational facility. Water training activities would continue to be scheduled to the extent possible to reduce potential impacts on

recreational and residential areas bordering the reservoir, especially during holidays or high use periods.

*Conchas Lake Alternative.* Adverse impacts on the socioeconomic environment and public use of Conchas Lake would be similar to those expected from the Ute Reservoir alternative. No training activities currently occur at Conchas Lake and the addition of these activities would result in additional impacts on visitors to the lake. Coordination procedures for Ute Reservoir would also be implemented at Conchas Lake.

#### *551st SOS Expansion of Flight Simulators*

*Building 724 Expansion (Preferred Alternative).* Short-term, minor, beneficial impacts on the local economy would be expected from renovations associated with the proposed use of the existing Echo simulator facility (currently used for storage) and construction of the new Foxtrot simulator facility. It is assumed that the equipment and supplies necessary to complete construction would be obtained locally, and local contractors would be used. As a result, beneficial impacts would occur from increased payroll tax revenue and the purchase of construction materials and goods in the area. Construction would require a small number of construction workers; therefore, the existing construction industry within the surrounding area should adequately provide enough workers to support construction. The temporary increase of construction workers at Cannon AFB would represent a small increase in the total number of persons working on the installation, and no additional facilities (e.g., housing, schools) would be necessary to accommodate the workforce. Proposed activities would occur entirely on Cannon AFB and would have little potential to adversely affect off-installation residents. Therefore, no adverse impacts on socioeconomics would be anticipated.

*Building 4675 Expansion Alternative.* Beneficial impacts on the local economy would be similar to those expected from the Building 724 alternative.

#### *27th SOMXS Munitions Storage Area Upgrades*

Short-term, minor, beneficial impacts on the local economy would be expected from the construction activities associated with the proposed upgrade of the munitions storage area. Beneficial impacts would result from increased payroll tax revenue and the purchase of construction materials and goods in the area. The proposed construction and demolition would only require a small number of construction workers; therefore, the existing construction industry within the surrounding area should adequately provide enough workers to support construction and demolition. The temporary increase of construction workers at Cannon AFB would represent a small increase in the total number of persons working on the installation, and no additional facilities (e.g., housing, schools) would be necessary to accommodate the workforce.

No long-term impacts on socioeconomic resources would be expected to result from the proposed construction and demolition of these buildings because it does not involve any change in personnel or housing.

### 3.10.3.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Short-term, minor, beneficial impacts on the local economy would be expected from the construction activities associated with the Proposed Action. Long-term, minor, adverse impacts

on the socioeconomic environment and recreational use of either Ute Reservoir or Conchas Lake would be expected from the proposed aerial component associated with upgrades of water safety training. Long-term, minor, beneficial impacts on the local economy would be expected from the overall increase in approximately 228 personnel at Cannon AFB, which would represent a 2 percent increase in the installation personnel population of 11,069 (CAFB 2016c). It is expected the installation and local area could provide the available existing housing to accommodate any increased demand from the increase in personnel.

#### 3.10.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the realignment of aircraft and personnel and increase in missions associated with the realignment would not occur and the existing conditions discussed in **Section 3.10.2** would remain unchanged. Because no demolition or construction would occur, construction workers would not be hired and the purchase of construction materials and goods from the surrounding area would not occur. Additionally, with no increase in installation personnel, the increase in payroll tax revenue would not occur. Therefore, no impacts on the local economy would be expected under the No Action Alternative.

# 4. Cumulative Effects

Federal regulations implementing NEPA (40 CFR §§ 1500–1508) require that the cumulative effects of a proposed action be assessed. CEQ regulations implementing the procedural provisions of NEPA define cumulative effects as follows (40 CFR §1508.7):

> "The impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

A cumulative effect could be additive (i.e., the net adverse cumulative effects are strengthened by the sum of individual effects), countervailing (i.e., the net adverse cumulative effect is less as a result of the interaction between beneficial and adverse individual effects), or synergistic (i.e., the net adverse cumulative effect is greater than the sum of the individual effects). Cumulative effects could result from individually minor, but collectively significant actions that take place over time. Accordingly, a cumulative effects analysis identifies and defines the scope of other actions and their interrelationship with the alternatives if there is an overlap in space and time. Cumulative effects are most likely to occur when there is an overlapping geographic location and a coincidental or sequential timing of events.

## 4.1 Projects Considered for Potential Cumulative Effects

This section discusses the potential for cumulative impacts caused by implementation of the Proposed Action when combined with other past, present, and reasonably foreseeable actions occurring near the component actions.

Cumulative effects may occur when there is a relationship between a proposed action or alternative and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. The effects may then be incremental and may result in cumulative impacts. Actions within close proximity to the Proposed Action or alternatives can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that are geographically separated. Similarly, actions that coincide in the same timeframe tend to offer a higher potential for cumulative effects.

In this EA, USAF has made an effort to identify cumulative projects on or near the component actions that are under consideration and in the planning stage at this time. These actions are included in the cumulative effects analysis to the extent that details regarding such actions exist and the actions have the potential to interact with the Proposed Action or alternatives outlined in this EA. Although the level of detail available for those future actions varies, this approach provides the decision maker with the most current information to evaluate the consequences of the alternatives. This EA addresses cumulative impacts to assess the incremental contribution of the alternatives to impacts on affected resources from all factors.

For the purposes of this analysis, past project activities are defined as historical actions that occurred on the installation and have shaped the current environmental conditions of the installation project areas. For many resource areas, such as biological resources, infrastructure,

and hazardous materials and wastes, the effects of past actions are now part of the existing environment and are incorporated in the descriptions of the affected environment in **Chapter 3**. Therefore, past actions are not analyzed further for cumulative impacts analysis.

### 4.1.1 On-Installation Cumulative Projects

Projects considered for cumulative impacts with the Proposed Action include those identified in the 2018 Cannon AFB Installation Development Environmental Assessment (IDEA), 27th SOW Realistic Military Training (RMT) in various communities proximal to the installation, and several small installation development projects and ongoing upgrades to regional infrastructure. Details on these projects follow:

- **Cannon AFB IDEA.** Cannon AFB and AFSOC analyzed priorities for installation improvement projects as identified in the Installation Development Plan (IDP) to be able to maintain the installation's mission and propose to implement them over the next 5 to 10 years (2018–2028) to support AFSOC mission requirements by improving the facilities, infrastructure, and utilities for current and future use (CAFB 2018). This project would entail construction, renovation, infrastructure development, and demolition actions throughout the installation. The USAF evaluated impacts from these proposed development actions in an EA.
- **27th SOW Realistic Military Training (2018–2023).** The 27th SOW plans to expand Realistic Military Training flight operations from Cannon AFB and Melrose AFR to allow for realistic training activities in additional locations (e.g., Clovis, Portales, Melrose, City of Rocks State Park) in New Mexico (CAFB 2016a). Distribution of flight training into these areas would provide air and ground crews with a more realistic environment for training in specific mission sets involving combat, intelligence, surveillance, and reconnaissance.
- **Cumulative Small Installation Infrastructure and Development Projects (2018–2020).** More than 50 small installation infrastructure (e.g., road, parking, fire suppression, electrical improvements) and development (e.g., airfield renovations and improvements, facility renovations and new construction) projects are planned and reasonably foreseeable at Cannon AFB over the next 5 years, pending availability of funding, above and beyond those analyzed under the Proposed Action in the 2018 Cannon AFB IDEA (CAFB 2016e).
- **Construction and Infrastructure Upgrades.** Construction and infrastructure upgrades on USAF installations are required to ensure mission sustainability and operational efficiency. Several projects have been identified as recently (i.e., within the last year) completed, ongoing, or near-future projects for 2019 and 2020. Most of these projects would have negligible potential for contributing to cumulative impacts and are not considered for further analysis in this EA. However, the following two projects are considered in this cumulative analysis (CAFB 2016a, CAFB 2016e).
    - ***Building 724 Parking Lot.*** A parking lot for the 551st SOS would be constructed in the area where Building 722 (scheduled for demolition as part of a separate military construction action) is currently located. An alternative to this would be to construct a parking lot in available development space adjacent to Building 724.

- ***Runway 04 Glideslope Generator***. The current runway 04 glidescope generator at Building 3050 is currently within a flood zone and is scheduled for replacement due to water damage. The new generator would be located nearby but out of the flood zone and the current facility concrete pad would be demolished.

### 4.1.2 Off-Installation Cumulative Projects

Although a range of development projects are planned within municipalities in eastern New Mexico in the near future, not every action would overlap in time or space with the Proposed Action to contribute to cumulative impacts on resources. The projects that could overlap with the Proposed Action to incur cumulative impacts include the following:

- **Multiple New Mexico Counties Implementing Capital Improvement Development Actions.** More than 100 capital improvement projects are identified in the State of New Mexico's Capital Improvements Database to be implemented between 2018 and 2022 across Taos, Mora, Harding, Quay, Guadalupe, Curry, Roosevelt, Chavez, Lincoln, Sandoval, Rio Arriba, Colfax, and San Miguel Counties. Planned improvements would include building renovations, roadway and parking lot reconstruction and improvements, upgrades supporting improved information technology, upgrades to improve water systems and distribution, wastewater system improvements, and fire station and fire water storage upgrades (NM DFA 2018)
- **Ute Pipeline Project.** The Eastern New Mexico Rural Water System (known locally as the Ute Pipeline Project) is a 20-year project involving phased construction of a 151-mile-long water transmission pipeline, a water intake system, a water treatment plant, several pump stations, and lateral pipelines for the distribution of water to surrounding municipalities (BoR 2011, Utton Center 2015). The project will provide for the Clovis, Portales, Melrose, Texico, Grady, and Elida, Cannon AFB, and the Curry and Roosevelt county municipal and industrial water supplies. Construction of the water intake system began in 2013. Construction of the pipeline began in March 2019 (Utton Center 2015, Albuquerque Journal 2018, Santa Fe New Mexican 2019).

## 4.2 Cumulative Effects on Resources

The following analysis examines the cumulative effects on the environment that would result from the incremental impacts of the Proposed Action, in addition to other past, present, and reasonably foreseeable future actions. This analysis assesses the potential for an overlap of impacts with respect to project schedules or affected areas. This section presents a qualitative analysis of the cumulative effects.

Under the No Action Alternative, there would be no change in the baseline conditions for any resource areas. Existing conditions would continue as described in **Sections 3.1** through **3.10**. No new cumulative impacts from the Proposed Action combined with other cumulative projects would be expected.

The Proposed Action, when combined with other past, present, and foreseeable projects concurrently constructed or operated, would not contribute to cumulative impacts on infrastructure and transportation, cultural resources, hazardous materials and waste, health and

safety, or recreation because impacts from the Proposed Action on those resources would range from none to negligible. Therefore, no further discussion of cumulative impacts on these resources is provided. Discussion of the potential for cumulative impacts on noise, air quality, airspace management, water resources, biological resources, and socioeconomics follows. The Proposed Action at Cannon AFB would not contribute to significant cumulative impacts on these resources.

***Noise*.** No significant cumulative impacts have been identified when combining all cumulative projects with the Proposed Action. The Proposed Action would introduce short-term, minor and long-term, negligible to minor increases in aircraft and construction noise to the ambient sound environment on and adjacent to Cannon AFB and in the northeastern New Mexico region. Considered together, construction of the 27th SOSS munitions storage, the 551$^{th}$ SOS flight simulators, projects identified in the Cannon AFB IDP and IDEA, and independent infrastructure and small development actions would contribute to cumulative minor increases in construction vehicle and equipment noise on the installation and in the region. All noise associated with the increased flight operations would be added to ongoing air operations in the area. Because the incremental increases in aircraft noise from the Proposed Action when combined with cumulative actions would be minor. Although aircraft training operations could increase 10 to 40 percent under the Proposed Action, designated airspaces would not change and noise levels would be well below historic levels when F-16 aircraft were stationed at Cannon AFB (CAFB 2007) Therefore, past, present, or reasonably foreseeable future projects or activities combined with the Proposed Action would not have greater than minor cumulative impacts.

***Air Quality.*** The Proposed Action would have short- and long-term, minor, adverse cumulative impacts on air quality. Temporary impacts would be expected from the increase in mobile source emissions such as commuter vehicles and aircraft operations, and demolition and construction projects. By directly inventorying all emissions in nonattainment regions and monitoring concentrations of criteria pollutants in attainment regions, the impacts of all past and present emissions from existing unit mission activities associated with the component actions are accounted for by the State of New Mexico. This is accomplished through the regulatory structure in place designed to prevent air quality deterioration for attainment areas. This structure of rules and regulations are contained in the state implementation plan (SIP). SIPs are the regulations and other materials for meeting clean air standards and associated CAA requirements.

The SIP process applies either specifically or indirectly to all activities in the region. Concurrent demolition and construction activities associated with the Proposed Action and other identified cumulative projects in the same vicinity could have short-term impacts on air quality from increased vehicle and air traffic and presence and operation of construction vehicles and equipment. Long-term impacts would occur from an increase in the number of personnel, heated space, and additional air operations at and near the installation. Total combined emissions would not exceed the General Conformity Rule *de minimis* threshold values. The Proposed Action, when combined with cumulative projects, would not threaten the region's attainment status, have substantial GHG emissions, or lead to a violation of any federal, state or local air regulation.

***Airspace Management.*** The added aircraft and operations associated with the Proposed Action would contribute long-term, negligible, adverse impacts (e.g., increased maintenance requirements and air traffic control efforts) on airfield and airspace management at Cannon AFB. Cumulatively, the additional aircraft (i.e., MC-130 and AC-130) and increase in air operations by the 9th SOS, 16th SOS, 3/12/33rd SOS, 27th SOSS SERE, and the 27th SOW RMT flight operations out of Cannon AFB would increase air traffic controller workload and may cumulatively contribute to increased congestion of other airspaces in the northeast New Mexico region. It would be expected that the total aircraft operations local to Cannon AFB would still be less than historic levels approximately 10 years ago and would not cause the total operations for the installation to meet or exceed the ATC or runway capacity of Cannon AFB's airfields. The 27th SOW RMT flight operations would be distributed to civilian airspace overlying communities proximal to the installation, and would contribute to impacts on air traffic control and congestion in those areas. Relative to regional aircraft activity, net increases in flight activity under the Proposed Action and other cumulative projects at Cannon AFB would be minor. As a result, any impacts on airspace management at Cannon AFB or within the region would be less than significant. Additionally, because the Proposed Action and other cumulative projects would not require alterations of the existing airspace, runway, or airfield configurations, no additional cumulative impacts on these resources would be expected.

***Water Resources***. Construction and demolition activities associated with the Proposed Action would result in short- and long-term, adverse impacts on ground and surface water. It is expected that the increase in personnel under the Proposed Action would slightly increase domestic water demand in the region by 0.1 percent and contribute to continued drawdown of the regional groundwater aquifer. Measures to address water management on the installation include continued implementation of water conservation education and installation of low-flow devices. Considered cumulatively, the level of development on the installation associated with the Proposed Action, when combined with other on- and off-installation cumulative projects, would translate into added personnel and facility requirements for water consumption. These actions would contribute cumulatively to long-term, moderate, adverse impacts on groundwater because the draw from potable water sources would be increased to meet demands of the installation and surrounding areas. It is expected that the surface water source provided by completion of the Ute Pipeline would be a major contributor of potable water on the installation and replace groundwater wells currently in use, which would help alleviate the current and projected rates of groundwater aquifer drawdown. Construction of the proposed facilities under the Proposed Action, projects identified in the Cannon AFB IDP and IDEA, and other identified cumulative projects would add more than 1 million $ft^2$ of impervious surface area on the installation. This would contribute to minor to moderate cumulative increases in installation runoff. Demolition of existing facilities and pavements and adherence to appropriate stormwater management regulations would help offset additions of impervious surfaces and impacts on floodplains that would be constructed for the Proposed Action and other cumulative projects.

***Biological Resources.*** Cumulative impacts on biological resources from the proposed increases in flight operations from Cannon AFB associated with the Proposed Action and the 27th SOW RMT project would be negligible because aircrews would adhere to existing flight safety and BASH protocols. Short- and long-term, adverse, cumulative impacts on wildlife would be expected from construction activities associated with the Proposed Action, projects identified

in the Cannon AFB IDP and IDEA, and the various infrastructure and facility improvements planned for the installation because of the removal of grassland habitat, but impacts would be less than significant. Additionally, the Proposed Action and other identified cumulative projects would contribute to minor increases in construction and aircraft flight noise that could impact wildlife.

***Socioeconomics.*** Construction associated with the proposed 551st SOS simulator facility, munitions storage area, 9th SOS parking lot, and other identified cumulative projects would result in short- to long-term, minor, beneficial impacts on the local economy and local employment levels from increased construction-related spending and payroll. The increase in personnel associated with the Proposed Action would contribute negligibly to cumulative beneficial economic impacts into the future when considered with the other identified cumulative projects. Long-term, minor, cumulative adverse impacts on the socioeconomic environment and public use of either Ute Reservoir or Conchas Lake would be expected from the proposed aerial component associated with upgrades of water safety training.

## 4.3 Unavoidable Adverse Effects

Unavoidable adverse effects resulting from implementation of the Proposed Action would include the continued use of fossil fuels—a nonrenewable natural resource—during training activities, and consumption of small amounts of other energy supplies, and continued drawdown of the regional groundwater aquifer due to slightly increased water demand from additional operations under the Proposed Action. The use of nonrenewable resources is an unavoidable occurrence, but would not be considered significant.

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

The Proposed Action would occur within airspace across the northeastern region of New Mexico where military flight operations already routinely occur. All operations would be conducted in accordance with pertinent regulations and air traffic control authorities. The nature of activities for the Proposed Action would not differ from current uses of these areas.

## 4.5 Relationship between Short-Term Uses of the Human Environment and Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the biophysical components of the human environment include direct, project-related disturbances and impacts associated with an increase of population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

The proposed facility development actions and increases in aircraft, flight operations, and personnel would not require short-term resource uses that would result in long-term compromises of productivity. The development actions would be consistent with the existing

land uses on the installation, and the flight operations would be consistent with flight programs for each associated squadron. Flight activities would incur long-term, intermittent uses of the airspace environment where training would occur.

## 4.6 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the impacts that the use of these resources would have on future generations. Irreversible impacts primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). Irreversible and irretrievable commitments of resources usually result from implementation of actions that involve the consumption of material resources used for construction, energy resources, and human labor resources. The use of these resources is considered to be permanent. Under the Proposed Action, most resource commitments are neither irreversible nor irretrievable. Construction activities under the Proposed Action would remove approximately 1.7 acres of disturbed grassland habitat. Given that these areas are already disturbed and represent a small portion of the vegetation and habitat available on the installation, these impacts are not expected to be significant.

*This page intentionally left blank.*

# 5. List of Preparers

This EA has been prepared by HDR, Inc. (HDR) and associated team members under the direction of AFSOC and Cannon AFB. The individuals who contributed to the preparation of this document are listed below and are from HDR unless otherwise noted:

**Michelle Bare**
General Studies
Years of Experience: 29

**Jeanne Barnes**
M.A. American History
B.A. American History
Years of Experience: 11

**Sharon Crowland (Stell)**
M.S. Public Affairs, Environmental Policy
B.S. Civil & Environmental Engineering
Years of Experience: 26

**Nicolas Frederick**
M.S. Biology
B.S. Psychology
Years of Experience: 10

**Stuart Gottlieb**
B.A. Geography
GIS Professional Certificate
Years of Experience: 15

**Leigh Hagan**
M.E.S.M. Environmental Science and Management
B.S. Biology
Years of Experience: 13

**Carolyn Hein**
B.S. Environmental Science
Years of Experience: 1

**Christopher Holdridge**
M.S. Environmental Assessment
B.S. Environmental Science/Chemistry
Years of Experience: 23

**Jeff Hudson (Stell)**
B.S. Environmental Biology
B.S. Chemistry
Years of Experience: 26

**Abbey Humphreys-Rowe**
M.S. Biology
B.S. Environmental Biology
B.S. Geospatial Science
Years of Experience: 2

**Nancy Jepsen**
M.S. Management
B.S. Management
Years of Experience: 22

**Tim Lavallee, PE (LPES)**
M.S. Civil and Environmental Engineering
B.S. Mechanical Engineering
Years of Experience: 30

**Elizabeth Leclerc**
B.A. Anthropology
Years of Experience: 9

**Kathy Lemberg**
B.A. Anthropology
Years of Experience: 12

**Christopher McJetters**
B.S. English
Years of Experience: 11

**Deborah Peer**
M.S. Environmental Science
B.S. Zoology
B.S. Wildlife Science
Years of Experience: 18

**Steven Peluso, CHMM, CPEA**
B.S. Chemical Engineering
Years of Experience: 31

**Steve Pyle**
J.D. Environmental Law
B.S. Natural Resources Management
Years of Experience: 18

**Morgan Shelby**
M.A. Environmental Sciences (in progress)
B.S. Environmental Science
Years of Experience: 3

**Patrick Solomon, CEP**
M.S. Geography
B.S. Geography
Years of Experience: 25

# 6. References

AFSC 2017 — Air Force Safety Center (AFSC). 2017. *USAF Wildlife Strikes by Altitude (AGL) FY19–5 - FY2016*. Available online: <https://www.safety.af.mil/Portals/71/documents/Aviation/BASH%20Statistics/USAF%20Wildlife%20Strikes%20by%20Altitude.pdf>. Accessed 3 December 2018.

AFSC 2018 — AFSC. 2018. *Bird/wildlife Aircraft Strike Hazard (BASH)*. Available online: <https://www.safety.af.mil/Divisions/Aviation-Safety-Division/BASH/>. Accessed 3 December 2018.

AFSOC 2014 — Air Force Special Operations Command (AFSOC). 2014. *Comprehensive Range Plan, Melrose Air Force Range, New Mexico*. Prepared by HDR, Inc. October 2014.

AFSOC 2016 — AFSOC. 2016. *Final Environmental Assessment for Utilization Enhancements at Melrose AFR*. Prepared by HDR, Inc. January 2016.

AirNav.com 2018a — AirNav.com. 2018. *Fort Sumner Municipal Airport (KFSU), New Mexico*. Available online: <https://www.airnav.com/airport/KFSU>. Retrieved 21 November 2018.

AirNav.com 2018b — AirNav.com. 2018. *Double V Ranch Airport, Fort Sumner, New Mexico.* Available online: <https://www.airnav.com/airport/NM38>. Retrieved 21 November 2018.

AirNav.com 2018c — AirNav.com. 2018. *Tucumcari Municipal Airport: Tucumcari, New Mexico*. Available online: <http://www.airnav.com/airport/KTCC>. Accessed 27 November 2018.

Albuquerque Journal 2018 — Albuquerque Journal. 2018. *Eastern New Mexico Pipeline Project Awarded $4M*. 9 November 2018. Available online: <https://www.abqjournal.com/1244625/eastern-new-mexico-pipeline-project-awarded-4m.html>. Accessed 3 December 2018.

ANSI 2013 — American National Standard Institute (ANSI). 2013. *American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound. Part 3: Short-term measurements with an observer present*. ANSI S12.9-1993 (R2013)/Part 3.

Audubon 2018 — National Audubon Society (Audubon). 2018. *Guide to North American Birds*. Available online: <https://www.audubon.org/bird-guide>. Accessed 1 December 2018.

Blanford et al. 2003 — Blanford, T. Neil; Blazer, Derek J.; Calhoun, Kenneth C.; Dutton, Alan R.; Naing, Thet; Reedy, Robert C.; and Scanlon, Bridget R. 2003. *Groundwater Availability of the Southern Ogallala Aquifer in Texas and New Mexico: Numerical Solutions through 2050.* Texas Water Development Board. February 2003.

BoR 2011 — Bureau of Reclamation (BoR). 2011. *Eastern New Mexico Rural Water System Environmental Assessment: Quay, Curry, and Roosevelt Counties, New Mexico Upper Colorado Region*. January 2011.

CAFB 1997 — Cannon Air Force Base (CAFB). 1997. *Cannon AFB Tank Status.*

CAFB 2005 — CAFB. 2005. *Cannon Air Force Base Waters of the United States Delineation*. August 2005.

CAFB 2007 — CAFB. 2007. *AFSOC Assets Beddown at Cannon Air Force Base, New Mexico Environmental Impact Statement*. July 2007.

CAFB 2012 — CAFB. 2012. *Area Development Plan and Infrastructure Capacity Analysis, Melrose Air Force Range, New Mexico.* November 2012.

CAFB 2015 — CAFB. 2015. *Cannon AFB and Melrose AFR Civilian Contractor Environmental Guide*. 2 July 2015.

CAFB 2016a — CAFB. 2016. *Cannon Air Force Base Realignment & Beddown Update EIAP List of Projects and Air Force 813 Forms*.

CAFB 2016b — CAFB. 2016. *Draft U.S. Air Force Integrated Natural Resources Management Plan, Cannon Air Force Base & Melrose Air Force Range, New Mexico.* October 2016.

CAFB 2016c — CAFB. 2016. *Installation Development Plan, Cannon Air Force Base, New Mexico*. April 2016.

CAFB 2016d — CAFB. 2016. *CAFB Defense ERP Sites Map.* June 2016.

CAFB 2016e — CAFB. 2016. *FY 2018-FY 2020 Priority Project List*. 7 October 2016.

CAFB 2017a — CAFB. 2017. *Final Air Installations Compatible Use Zones (AICUZ) Study for Cannon AFB, New Mexico*. 2017.

CAFB 2017b — CAFB. 2017. *U.S. Air Force, Integrated Cultural Resources Management Plan, Cannon Air Force Base.* 1 August 2017.

CAFB 2017c — CAFB. 2017. *Cannon Air Force Base Final Spill Prevention and Response Plan*. May 2017.

CAFB 2017d — CAFB. 2017. *U.S. Air Force Hazardous Waste Management Plan, Cannon Air Force Base and Melrose Air Force Range*. May 2017.

CAFB 2018 — CAFB. 2018. *Final Environmental Assessment Addressing Installation Development at Cannon Air Force Base, New Mexico*. Prepared by HDR. May 2018.

CALTRANS 2013 — California Department of Transportation (CALTRANS). 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. September 2013.

Cornell 2017 — Cornell Lab of Ornithology (Cornell). 2017. *All About Birds.* Available online: <https://www.allaboutbirds.org>. Accessed 1 December 2018.

Curry County 2018 — Curry County. 2018. *Curry County Infrastructure Capital Improvement Plan*. 19 September 2018. Available online: <http://www.currycounty.org/information/icip>. Retrieved 3 December 2018.

DoD 1973 — Department of Defense (DoD). 1973. *Military Specification: Sea Marker Packet, Inflatable Survival Equipment (MIL-S-17980D).* Available online: <http://everyspec.com/MIL-SPECS/MIL-SPECS-MIL-S/MIL-S-17980D_14329>. Accessed 24 July 2019.

DoD 2016 — DoD. 2016. *Strategic Sustainability Performance Plan FY 2016.* Available online: <https://www.denix.osd.mil/sustainability/ dod-sspp/unassigned/department-of-defense-strategic-sustainability-performance-plan-fy-2016/>. Accessed 20 April 2019.

DOEA 2011 — Department of Economic Adjustment (DOEA). 2011. *Joint Land Use Study for Cannon and Melrose AFBs*. Available online: <http://www.oea.gov/ sites/default/files/resources/cannon_afb_jlus_final_0.pdf>. Accessed June 2017.

ENMWUA 2018 — Eastern New Mexico Water Utility Authority (ENMWUA). 2018. *Water Authority gives "Notice to Proceed" on Next Leg of Project.* 1 November 2018.

Eglin AFB 2016 — Eglin AFB. 2016. *Environmental Assessment Addressing the Proposed C-146A Aircraft Beddown at Duke Field.* Prepared by HDR, Inc. May 2016.

FAA 2017 — Federal Aviation Administration (FAA). *2017. Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures*. 12 October 2018. Available online: <https://www.faa.gov/air_traffic/ publications/media/aim.pdf>. Accessed 30 November 2018.

FEMA 2017a — Federal Emergency Management Agency (FEMA). 2017. *FEMA Flood Map Service Center: Cannon AFB*. Available online: <https://msc.fema.gov/portal/search?AddressQuery=conchas%20lake>. Accessed 10 December 2018.

FEMA 2017b — FEMA. 2017. *FEMA Flood Map Service Center: Conchas Lake.* Available online: <https://msc.fema.gov/portal/search?AddressQuery=conchas%20 lake>. Accessed 10 December 2018.

FEMA 2017c — FEMA. 2017. *FEMA Flood Map Service Center: Quay County*. Available online: <https://msc.fema.gov/portal/search?AddressQuery=conchas%20 lake>. Accessed 10 December 2018.

FHWA 2006 — Federal Highway Administration (FHWA). 2006. *Construction Noise Handbook.* FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. NTIS No. PB2006-109102. August 2006.

Griffith et al. 2006 — Griffith, G.E., Omernik, J.M., McGraw, M.M., Jacobi, G.Z., Canavan, C.M., Schrader, T.S., Mercer, D., Hill, R., and Moran, B.C., 2006. *Ecoregions of New Mexico: Reston, Virginia, U.S. Geological Survey (map scale 1:1,400,000).*

Hart and McAda 1985 — Hart, D. L. and McAda, D. P. 1985. *Geohydrology of the High Plains Aquifer in Southeastern New Mexico: HA-679*. U.S. Geological Survey Hydrological Investigations Atlas.

Idcide 2018 — Idcide. 2018. *Weather and Climate for Cannon AFB*. Available online: <http://www.idcide.com/weather/nm/clovis.htm>. Accessed November 2018.

IMBCR 2018 — Integrated Monitoring in Bird Conservation Regions (IMBCR) Program. 2018. *IMBCR Playa Lakes Joint Venture Report*. Available online: <http://pljv.org/documents/IMBCR/2018_IMBCR_PLJV_NewMexico_ report.pdf>. Accessed 26 July 2019.

Kaltenbach 2008 — Kaltenbach, M., Maschke, C. & Klinke, R. 2008. *Health consequences of aircraft noise*. Dtsch Arztebl Int, 105(31-32): 548-556.
Lakeview Support Systems. 2018. *History of Conchas Dam.* Available online: <http://www.conchasdam.com/history.htm>. Accessed 27 November 2018.

Lakeview Support Systems 2018 — Lakeview Support Systems. 2018. *History of Conchas Dam*. Available online: <http://www.conchasdam.com/history.htm>. Accessed 27 November 2018.

Langman et al. 2004 — Langman, J.B.; Gebhardt, F.E.; and Falk, S.E. 2004. *Ground-Water Hydrology and Water Quality of the Southern High Plains Aquifer, Melrose Air Force Range, Cannon Air Force Base, Curry and Roosevelt Counties, New Mexico, 2002–03.* USGS Scientific Investigations Report 2004-5158.

Langman et al. 2006 — Langman, Jeff B.; Falk, Sarah E.; Gebhardt, Fredrick E.; and Blanchard, Paul, J. 2006. *Ground-Water Hydrology and Water Quality of the Southern High Plains Aquifer, Cannon Air Force Base, Curry County, New Mexico, 1994–2005.* USGS Scientific Investigations Report 2006-5280.

Larkin 1996 — Larkin, R.P. 1996. *Effects of Military Noise on Wildlife: A Literature Review*. Center for Wildlife Ecology, Illinois Natural History Survey.

Manci et al. 1988 — Manci, K.M., D.N. Gladwin, R. Villella, and M.G. Cavendish. 1988. *Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis*. AFESC TR 88-14, NERC-88/29. June 1988.

Musharrafieh and Logan 1999 — Musharrafieh, G. R. and Logan, L.M. 1999. *Numerical Simulation of Groundwater Flow for Water Rights Administration in the Curry and Portables Valley Underground Water Basins, New Mexico.* New Mexico Office of the State Engineer, Technical Division Hydrology Bureau Report 99-2. March 1999.

MyBaseGuide 2017 — MyBaseGuide.com. 2017. MyBaseGuide.com: Cannon AFB. Available online: <https://www.mybaseguide.com/air_force/54/cannon_afb>. Accessed 10 December 2018.

NCA 2014 — The Third National Climate Assessment (NCA). 2014. *Climate Change Impacts in the U.S., Southwest Region.* <http://nca2014.globalchange.gov/report/regions/southwest#intro-section-2>. Accessed June 2017.

NGA 2008 — National Geospatial-Intelligence Agency (NGA). 2008. *Area Planning, Special Use Airspace, North and South America*. 20 November 2008.

NGA 2016 — NGA. 2016. *Area Planning, Military Training Routes, North and South America*. 21 July 2016.

NMDGF 2016 — New Mexico Department of Game & Fish (NMDGF). 2016. *Recovery Plans, Reports, Reviews*. Available online: <http://www.wildlife.state.nm.us/conservation/wildlife-species-information/threatened-and-endangered-species/>. Accessed 1 December 2018.

NMDGF 2018a — NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Curry County Species of Greatest Conservation Need Report*. Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 30 November 2018.

NMDGF 2018b NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Curry County Federal or State Threatened/Endangered Species Report.* Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 30 November 2018.

NMDGF 2018c NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Species Search*. Available online: <http://www.bison-m.org/SuperSearch.aspx>. Accessed 30 November 2018.

NMDGF 2018d NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Roosevelt County Species of Greatest Conservation Need Report.* Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 2 December 2018.

NMDGF 2018e NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Roosevelt County Federal or State Threatened/Endangered Species Report.* Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 30 November 2018.

NMDGF 2018f NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Chavez, De Baca, Curry, Roosevelt, San Miguel, and Quay Counties Federal or State Threatened/Endangered Species Report.* Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 2 December 2018.

NMDGF 2018g NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) Quay County Federal or State Threatened/Endangered Species Report.* Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 3 December 2018.

NMDGF 2018h NMDGF. 2018. *Biota Information System of New Mexico (BISON-M) San Miguel County Federal or State Threatened/Endangered Species Report*. Available online: <http://www.bison-m.org/BisonReportView.aspx>. Accessed 3 December 2018.

NMED 2018 NMED. 2018. *Surface Water Quality Bureau*. Available online: <https://www.env.nm.gov/surface-water-quality/point-source-regulation-section>. Access 29 November 2018.

NM DFA 2018 New Mexico Department of Finance & Administration (NM DFA). 2018. Capital Appropriations Database. Available online: <http://cpms.dfa.state.nm.us/index.aspx>. Accessed 20 December 2018.

NM EMNRD 2018 New Mexico Energy, Minerals and Natural Resources Department (NM EMNRD). 2018. *Fishing at New Mexico State Parks*. Available online: <http://www.emnrd.state.nm.us/SPD/fishing.html>. Accessed 2 December 2018.

NM OSE 2018 New Mexico Office of the State Engineer (NM OSE). 2018. *Ute Reservoir.* Available online: <http://www.ose.state.nm.us/Basins/Canadian/isc_Canadian_Ute.php>. Accessed 3 December 2018.

Parmenter et al. 1994 Parmenter, R.R., E. Muldavin, T.L. Yates, J.N. Stuart, G.H. Farley, T. Maddux. 1994. *A Biological Survey of Melrose Air Force Range, Melrose, New Mexico.* University of New Mexico Department of Biology and New Mexico Natural Heritage Program, Albuquerque, New Mexico.

Rebman 2016 — Rebman, John. 2016. Personal communication with John Rebman, 27 SOCES/CEIE, regarding NPDES Permitting on Cannon AFB. 7 October 2016.

RJH Consultants 2018 — RJH Consultants, Inc. 2018. *Ute Dam and Reservoir, Quay County, New Mexico.* Available online: <https://www.rjh-consultants.com/projects/ute-dam-and-reservoir>. Accessed 30 November 2018.

Rylander 1974 — Rylander, Sorensen and Berglund. 1974. *Reanalysis of Aircraft Noise Annoyance Data Against the dBA Peak Concept*. J. Sound and Vibration (36):399–406.

Rylander 1988 — Rylander and Bjorkman. 1988. *Maximum Noise Levels as Indicators of Biological Effects*. J. Sound and Vibration (127):555–563.

Santa Fe New Mexican 2019 — Santa Fe New Mexican (Newspaper). 2019. *Eastern New Mexico Officials Break Ground on Water Pipeline*. Available online: <https://www.santafenewmexican.com/news/local_news/eastern-new-mexico-officials-break-ground-on-water-pipeline/article_0a7fe58d-34e1-5dd3-a1f0-158b14045fe1.html>. Accessed 5 April 2018.

Stockton et al. 2011 — Stockton, Kelly A. (USGS), Christine M. Moffitt (USGS), David L. Blew (Idaho Power), and C. Neal Farmer (Idaho Department of Natural Resources). 2011. *Acute Toxicity of Sodium Fluorescein to Ashy Pebblesnails* (Fluminicola fuscus). Report Prepared for Hagerman National Fish Hatchery, USFWS. 13 February 2011.

Trinity 2012 — Trinity Analysis & Development Corp. (Trinity). 2012. *Water Sustainability and Management Report, Air Force Special Operations Command, Hurlburt Field and Cannon Air Force Base, Okaloosa County, Florida and Curry County, New Mexico.* February 2012.

USAF 1998 — United States Air Force (USAF). 1998. *Memorandum for [1]1th RS/MA. Subject: Consultative Letter, AL-OE-BR-CL-19984052, Noise Assessments of the Predator Unmanned Aerial Vehicle (UAV).* Indian Springs AFAF, NV. 31 March 1998.

USAF 2011 — USAF. 2011. *Melrose Air Force Range Environmental Assessment for the Comprehensive Range Plan.*

USAF 2013 — USAF. 2013. *NOISEMAP Aircraft Noise Model, Version 7.3.*

USAF 2015 — USAF. 2015. *Air Force Instruction 32-7063: Air Installations Compatible Use Zones (AICUZ) Program*. 15 July 2015.

USAF 2016a — USAF. 2016. *Air Force Instruction 32-7070: Air Force Noise Program.* 21 April 2016.

USAF 2016b — USAF. 2016. *Air Force Instruction 48-127: Occupational Noise and Hearing Conservation Program.* 26 February 2016.

USAF 2018 — USAF. 2018. *SELCalc3 Aircraft Noise Model, Version 1.0.3.*

USAF 2019 — USAF. 2019. *Air Conformity Applicability Model (ACAM)*.

USCB 2010 — United States Census Bureau (USCB). 2010. *Total Population 2010 Census Summary File 1*. Available online: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml#>. Accessed 4 December 2018.

USCB 2016a USCB. 2016. *Total Population 2012-2016 American Community Survey 5-Year Estimates*. Available online: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml#>. Accessed 4 December 2018.

USCB 2016b USCB. 2016. *Selected Economic Characteristics 2012-2016 American Community Survey 5-Year Estimate*. Available online: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml#>. Accessed 4 December 2018.

USCB 2016c USCB. 2016. *Selected Housing Characteristic 2012-2016 American Community Survey 5-Year Estimates*. Available online: <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml#>. Accessed 4 December 2018.

USDOI 2011 United States Department of Interior (USDOI). 2011. *Eastern New Mexico Rural Water System Environmental Assessment, Quay, Curry, and Roosevelt Counties, New Mexico, Upper Colorado Region*. 27 January 2011.

USEIA 2014 U.S. Energy Information Administration (USEIA). 2016. *State Carbon Dioxide Emissions, November 3, 2016.* <https://www.eia.gov/environment/emissions/state/>. Accessed June 2017.

USEPA 1971 U.S. Environmental Protection Agency (USEPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*. Washington, DC: s.n., Publication NTID300.1.

USEPA 2018a USEPA. 2018. *Attainment Status*. Available online: <http://www.epa.gov/airquality/greenbook/anay_nm.html>. Accessed November 2018.

USEPA 2018b USEPA. 2018. AirData Web Site. Available online: <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>. Accessed November 2018.

USFWS 2008 U.S. Fish and Wildlife Service (USFWS). 2008. *Birds of Conservation Concern 2008*. Prepared by USFWS Division of Migratory Bird Management, Arlington, Virginia. December 2008.

USFWS 2011 USFWS. 2011. *Arkansas River Shiner*. Available online: <https://www.fws.gov/southwest/es/oklahoma/Documents/TE_Species/Species%20Profiles/AR%20River%20Shiner.pdf>. Accessed 1 December 2018.

USFWS 2012 USFWS. 2012. *Species Status Codes*. Available online: <https://www.fws.gov/endangered/about/listing-status-codes.html>. Accessed 1 December 2018.

USFWS 2016 USFWS. 2016. *Endangered Species Act Experimental Populations.* Available online: <https://www.fws.gov/pacific/ecoservices/endangered/recovery/pdf/10j%20Experimental%20Population%20Fact%20Sheet%2011-9-16%20(approved%20by%20ARD-ES).pdf>. Accessed 2 December 2018.

USFWS 2018a USFWS. 2018. *IPaC Resource List – Cannon AFB*. Available online: <https://ecos.fws.gov/ipac/>. Accessed 30 November 2018.

USFWS 2018b USFWS. 2018. *Species by County Report – Curry, New Mexico*. Available online: <https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=35009>. Accessed 1 December 2018.

USFWS 2018c — USFWS. 2018. *IPaC Resource List – Melrose AFR*. Available online: <https://ecos.fws.gov/ipac/>. Accessed 2 December 2018.

USFWS 2018d — USFWS. 2018. *IPaC Resource List – Regional Airspace*. Available online: <https://ecos.fws.gov/ipac/>. Accessed 2 December 2018.

USFWS 2018e — USFWS. 2018. *IPaC Resource List – Ute Lake.* Available online: <https://ecos.fws.gov/ipac/>. Accessed 2 December 2018.

USFWS 2018f — USFWS. 2018. *IPaC Resource List – Conchas Lake.* Available online: <https://ecos.fws.gov/ipac/>. Accessed 2 December 2018.

USFWS 2018g — USFWS. 2018. *National Wetland Inventory, Wetlands Mapper.* Available online: <http://www.fws.gov/wetlands/Data/Mapper.html>. Accessed 29 November 2018.

USFWS 2018h — USFWS. 2018. *Species Profile for Southwestern Willow flycatcher* (Empidonax traillii extimus). Available online: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B094>. Accessed 3 December 2018.

USFWS 2019 — USFWS. 2019. *Environmental Conservation Online System for Threatened and Endangered Species*. Available online: <https://ecos.fws.gov/ecp>. Accessed 26 July 2019.

USGS 2018 — U.S. Geological Survey (USGS). 2018. Estimated Use of Water in the United States in 2015. USGS Circular 1441. Available online: <https://pubs.usgs.gov/circ/1441/circ1441.pdf>. Accessed 5 August 2019.

Utton Center 2015 — Utton Transboundary Resources Center (Utton Center). 2015. *Water Matters: Eastern New Mexico Rural Pipeline Project (Ute Pipeline Project).* Available online: <http://uttoncenter.unm.edu/pdfs/water-matters-2015/25_Eastern_New_Mexico_Rural_Water_System.pdf>. Accessed 13 December 2018.

Victor 2018 — Victor. 2018. *Bojax Ranch Airport*. Available online: <https://www.flyvictor.com/en-us/private-jet-airports/bojax-ranch-airport-(nm44)/#/>. Accessed 23 November 2018.

Walthall and Stark 1999 — Wathall, W.K. and J.D. Stark. 1999. *The Acute and Chronic Toxicity of Twyo Xanthene Dyes, Fluorescein Sodium Salt and Phloxine B, to* Daphnia pulex. J. Environmental Pollution (104):207-215.

# A

# Public and Stakeholder Coordination

# Appendix A: Public and Stakeholder Coordination List

**Federal Parties**

United States Senate, New Mexico Senators

United States House of Representatives, New Mexico's 2nd and 3rd District Representatives

Bureau of Indian Affairs, Southwest Region

Natural Resources Conservation Service, District Conservationist

U.S. Army Corps of Engineers Albuquerque District, Chief Environmental Resources Section

Bureau of Land Management New Mexico State Office

U.S. Environmental Protection Agency, Region 6

U.S. Fish & Wildlife Service, Southwest Region

**State Parties**

The Honorable Susana Martinez Governor, State of New Mexico

State Representative, New Mexico House of Representatives, District 64

State Senator, New Mexico Senate, District 27

New Mexico State Historic Preservation Division, State Historic Preservation Officer

New Mexico State Land Office, Clovis District Office

New Mexico Environment Department, District 1 Main Office

New Mexico Indian Affairs Department

New Mexico Office of Military Base Planning and Support

New Mexico Department of Agriculture

New Mexico Department of Game and Fish, Southeast Office

**Local Parties**

City Manager, City of Clovis

Mayor, City of Clovis

Mayor, City of Portales

Mayor, City of Fort Sumner

Mayor, City of San Luis, CO

District 3 Commissioner, Curry County

County Manager, Curry County

County Manager, Roosevelt County

County Manager, Chaves County

County Manager, Lincoln County

County Manager, Guadalupe County

County Manager, Quay County

County Manager, Sandoval County

County Manager, Rio Arriba County

County Manager, Taos County

County Manager, Colfax County

Chair of County Commissioners, Mora County

County Manager, San Miguel County

County Manager, Harding County

**Native American Tribal Contacts**

Apache Tribe of Oklahoma

Comanche Nation of Oklahoma

Jicarilla Apache Nation

Kiowa Tribe of Oklahoma

Mescalero Apache Tribe

*This page intentionally left blank.*

# Wait times to increase at border crossings

By Angela Kocherga
ALBUQUERQUE JOURNAL

SANTA TERESA — New Mexico's busiest border crossing is expected to experience delays because U.S. Customs and Border Protection officers from here are among those deployed to Arizona and California to prepare for the migrant caravan.

Some of those CBP officers departed on charter flights from El Paso on Thursday after the first families in the migrant caravan from Central America arrived in the Mexican border city of Tijuana.

CBP announced it was diverting "a large number of specially trained CBP officers" from Santa Teresa in New Mexico and El Paso and Tornillo in Texas and advised that would lead to "longer than normal wait times at area ports" beginning Wednesday.

"Cross-border travelers should expect lanes to be closed and anticipate processing times to increase," said El Paso Director of Field Operations Hector Mancha. "We suggest reducing or consolidating your cross-border trips, and if you must cross the border, build extra time into your schedule to accommodate these expected delays."

Usual wait times in the area range from 20 to 45 minutes, according to CBP, although some border crossers report it can take more than an hour to traverse in some areas.

A total of 573 CBP officers nationwide were sent to meet the caravan, CBP said, but the agency did not provide a breakdown showing where the officers are based or how long they will be away from their usual assignments.

The staffing shortage is expected to impact pedestrian and vehicle traffic, as well as commercial trucks using area ports, including the Santa Teresa border crossing.

"We certainly don't want to see wait time increase," said Jerry Pacheco, CEO of the Santa Teresa-based Border Industrial Association. "That affects commerce, that increases costs. That causes inefficiencies."

An estimated $22 billion in goods move through the port of entry, which accounts for more than half of all of New Mexico's global exports, according to the U.S. Department of Commerce.

"Here at Santa Teresa we're often on the razor's edge of not having enough agents," Pacheco said. "The regulars and the locals really have to pay for this. To me, it's obvious rather than spending money on a border wall."

Border residents in the southern New Mexico region will have to contend with delays even during rush hour when the "All Lanes Open Initiative" is in effect between 6 and 10 in the morning to ease the commute for thousands of people who cross to work or attend classes on the U.S. side, including New Mexico State University students.

Predicted delays at the border could not come at a worse time for New Mexico retailers, who depend on shoppers from Mexico. Those shoppers spend an estimated $2 billion a year in the region, according to the Borderplex Alliance, which promotes economic development in the Las Cruces, El Paso and Ciudad Juárez region.

Some of those shoppers are visitors from the interior of Mexico, including Chihuahua, who prefer to bypass heavy traffic in Juárez by taking the Santa Teresa border crossing, which is a short drive from an outlet mall and Interstate 10.

Border crossings increase during the holiday season along with wait times as families from Mexico visit relatives on the U.S. side. Some also plan their Christmas shopping trips to take advantage of Black Friday and other deals.

Both big box stores and small shops benefit. The Chocolate Lady in historic Mesilla already has Christmas candy on display.

"Mesilla is a destination spot," said Lucy Rathgeber, the Chocolate Lady manager.

Located right on the plaza, the shop sees the number of customers triple on weekends, according to Rathgeber.

"It's Little Mexico because we have so many that come here," she said.

Rathgeber said she hopes the craving for hand-crafted chocolate will outweigh the hassle of waiting in long lines to cross the border.

"Everybody likes sweets," she said.

# Christmas Railway gets new shows

ROSWELL DAILY RECORD

ROSWELL — The Roswell Christmas Railway, which opens its third season on Friday, is on track to bring holiday cheer to Southeast New Mexico.

In its first two seasons, the holiday presentation saw more than 26,000 visitors from New Mexico, Texas, Colorado and beyond, officials said.

This year Roebuck Entertainment is adding more than 18 miles of LED Christmas lights plus two new shows — Nativity Virtual Reality (VR) and Christmas Fairies versus The Fire Dragon — to the experience.

"We love using new technology to tell the Christmas story," said Jacob Roebuck, producer of Roswell Christmas Railway. "Nativity VR is an immersive, powerful way to experience the story of the birth of Jesus."

Nativity VR uses Oculus VR technology and Unreal Engine graphics to take a dozen guests to see the biblical Christmas story in a 360-degree, 3D experience. Boyd Barrett, a local actor and voice artist, narrates the journey 2,000 years back in time.

Another new addition is a light and dance spectacular called "Christmas Fairies versus The Fire Dragon."

"Some people wonder what fairies and dragons have to do with Christmas," said Paul T. Semones, producer of the show. "It turns out the aurora borealis, the northern lights, are a magical barrier to protect Santa's village at the North Pole from dragons. I mean — you can't make this stuff up."

## Fast facts

**Roswell Christmas Railway**

- **When**: Nov. 23-25; Nov. 30-Dec. 2; Dec. 7-9; Dec. 14-16; Dec. 18-24; Dec. 27-30 (5 p.m. to 9 p.m.)
- **Where**: Spring River Park and Zoo, 1306 E. College Blvd., Roswell
- **Tickets**: $12 for adults, $8 for children 3-14. Children under 3 are free.
- **Information**: RoswellChristmasRailway.com

Courtesy photo: Roswell Daily Record

The Roswell Christmas Railway begins its third season on Thanksgiving weekend.



**Notice for Early Public Review of a Proposed Action in a 100-Year Floodplain**

To: All Interested Agencies, Groups, and Individuals

The U.S. Air Force (USAF) proposes to update aircraft realignment and bed down activities supporting Cannon AFB's mission. The Proposed Action is subject to the requirements and objectives of Executive Order (EO) 11988, Floodplain Management, because some of the related support infrastructure to be constructed on the installation would be located in a floodplain. This notice is required by Section 2(a)(4) of EO 11988 and has been prepared and made available to the public by the USAF in accordance with 32 Code of Federal Regulations, Part 989.24(c), and USAF Instruction 32-7064 for actions proposed in floodplains or wetlands. The USAF is preparing an Environmental Assessment in accordance with the National Environmental Policy Act (NEPA) and the USAF's Environmental Impact Analysis Process.Cannon AFB will contact the U.S. Fish & Wildlife Service, State of New Mexico Environment Department, and the New Mexico State Historic Preservation Office for their input on the Proposed Action during preparation of a Draft Environmental Assessment as a part of the NEPA review process.

A number of areas on Cannon AFB are within the 100-year floodplain due to substantial flow of surface drainage from north of the installation across the cantonment area and flight line and to the south.Expansion of three facilities under the Proposed Action is estimated to modify up to approximately 16,200 ft$^2$ of structures in the floodplain, or approximately 0.04 percent of the installation's total acreage located in the floodplain. The proposed construction would be designed to minimize floodplain impacts by diverting water away from the sites of development to the extent possible. The proposed floodplain displacement is expected to have no effect on flooding potential in the area.

The public comment period ends 30 days after the publication of this notice. Address written comments to Dr. Linda Tello, 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103, or linda.tello.1@us.af.mil.

# Sinkholes plague Santa Rosa

By Steve Hansen
THE COMMUNICATOR

SANTA ROSA — Small sinkholes have been plaguing the residents of Brown Avenue, a one-block street on the southern edge of Santa Rosa, for 18 years at least.

One of those residents, Victor Anaya, has a letter dated Sept. 27, 2005, from Michael Romero, the city of Santa Rosa's code enforcement officer at the time, stating that the sinkhole hazard on that block presents a hazard to bicycle riders and pedestrians.

The sinkhole problem, he said, had the potential to become worse with heavy traffic.

"It appears that immediate (action) should be taken," the letter states.

Now, 18 years later, the problems persist.

Anaya points to where the city patched a sinkhole in the street recently, but demonstrates a hole in his yard that he can put his arm into, up to his elbow. He also shows a strip of plumber's foam he has placed along the width of his driveway where it meets the sidewalk to prevent water leakage from another sinkhole.

His next-door neighbor's driveway has been undermined by a six-inch deep sinkhole where it meets the sidewalk.

Across the street, Joey Silva demonstrates with hammer blows where the sidewalk in front of his house has hollow spots. One section of the sidewalk was replaced recently due to sinkhole damage.

At the corner of Brown and Fifth, Jose Gonzales shows the hollowed-out area under a transition between concrete sections in his driveway, where another sinkhole is at work.

Around the corner, he points out another sinkhole in the street, ironically only a few feet from the storm sewer drain, where water is supposed to flow.

Anaya says the city should be taking more preventive actions.

"If you have a little cavity," he said, "You take it to the dentist while it's still a little hole," he said.

Santa Rosa City Administrator Adam Gallegos said city officials have been aware of Brown Avenue's sinkholes for a long time, but there is not much the city can do.

"Years ago," he said, "that area was a lake."

That was 70 to 80 years ago, he said, and development of the area that includes Brown Avenue began maybe 60 years ago, he said.

"That means the water table is very high," he said.

When water tables are high, there are often sinkholes, he said.

That also means, however, that the city cannot correct the condition.

"We just have to keep fixing the sinkholes as they come up," he said.

# Demonstrators protest outside conference

By Steve Terrell
THE SANTA FE NEW MEXICAN

SANTA FE — Chanting "We won't drink your fracking water" and "You can't drink oil, keep it in the soil," about two dozen members of Red Nation and allied environmentalists protested a "produced water" conference at Hotel Santa Fe on Friday.

The conference attracted those involved in the oil and gas industry, water treatment advocates and economic development professionals. According to its website, the gathering is intended to "improve New Mexico and federal regulatory and environmental frameworks; and to foster economically viable opportunities to enhance fresh water conservation, produced water resource recovery, and produced water beneficial use."

Protesters weren't buying that.

"Produced water is water from fracking," said Kyon Benally, an organizer of the protest. "It's contaminated, and they say they want to sell it as recycled water."

Environmentalists have long been concerned that produced water may contain toxic heavy metals — such as lead, zinc, iron, barium and manganese — which could seep into water supplies if put back in the ground.

"Chemicals used in fracking are not able to be cleaned," said Ahjani Yepa of Jemez Pueblo. "It's really a bad idea, one of the worst I've seen in all the battles I've been involved in. Using fresh water in one of the most dry and arid states is really a backwards solution."

Rebecca Sobel of WildEarth Guardians, who spoke at Friday's rally, said that for every barrel of oil produced, at least five barrels of produced water are generated.

But one of the conference organizers said Red Nation was mischaracterizing the purpose of the conference.

"We want to protect the environment and protect human health," said Jeri Sullivan-Graham of the New Mexico Desalination Association. "We're looking for ways to save fresh water.

"Nobody's going to dump (the produced water) back into the ground without a whole lot more research," Sullivan-Graham added, noting that possible uses for the water could include using it for cooling towers and possibly for agriculture.

However, Sullivan-Graham said, agricultural use wouldn't happen any time soon. "The technology is there, but it's not yet cost-effective," she said.

Sullivan-Graham said conference participants want to produce a white paper for incoming Gov. Michelle Lujan Grisham and members of the new administration.

**DEPARTMENT OF THE AIR FORCE**
**27TH SPECIAL OPERATIONS CIVIL ENGINEER SQUADRON (AFSOC)**
**CANNON AIR FORCE BASE, NEW MEXICO**

MAR 15 2019

MEMORANDUM FOR DISTRIBUTION

FROM: David E. Schnabel, P.E.
Deputy Commander, 27 SOCES
506 N Air Commando Way
Cannon AFB NM 88103

SUBJECT: Environmental Assessment (EA) Addressing Aircraft Realignment and Beddown Activities at Cannon Air Force Base, New Mexico

1. The United States Air Force (USAF) and the 27th Special Operations Wing (SOW) under the Air Force Special Operations Command (AFSOC) at Cannon Air Force Base (AFB), New Mexico, have initiated an EA to implement aircraft realignment and beddown actions. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs include:

- Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with additional aircraft and training activities in existing training areas (military operations areas and Instrument Route-109)
- Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft (RPA) personnel from 315 to 400.
- Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft and training activities in existing training areas (similar to 9 SOS)
- Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month
- Construction of an additional 551 SOS flight simulator bay on Cannon AFB
- Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB.

These programs, which would update similar activities identified in the 2007 Environmental Impact Statement for AFSOC Assets Beddown at Cannon AFB, include increases in personnel, aircraft, and training levels; demolition; and facility construction. Location maps and data tables for the projects are presented in the attached enclosures.

2. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and feedback on the Proposed Action. Your comments will help us develop the scope of our environmental review, which is being conducted in accordance with the National Environmental Policy Act and its implementing regulations. The USAF anticipates publishing the Draft EA in early spring 2019 and the Final EA by summer 2019.

3. Please provide your written questions or comments on the Proposed Action at your earliest convenience, but no later than 30 days from the date of this correspondence. Please address all questions and comments to Ms. Crystal Chavez, 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are encouraged to be sent by email to crystal.chavez@us.af.mil.

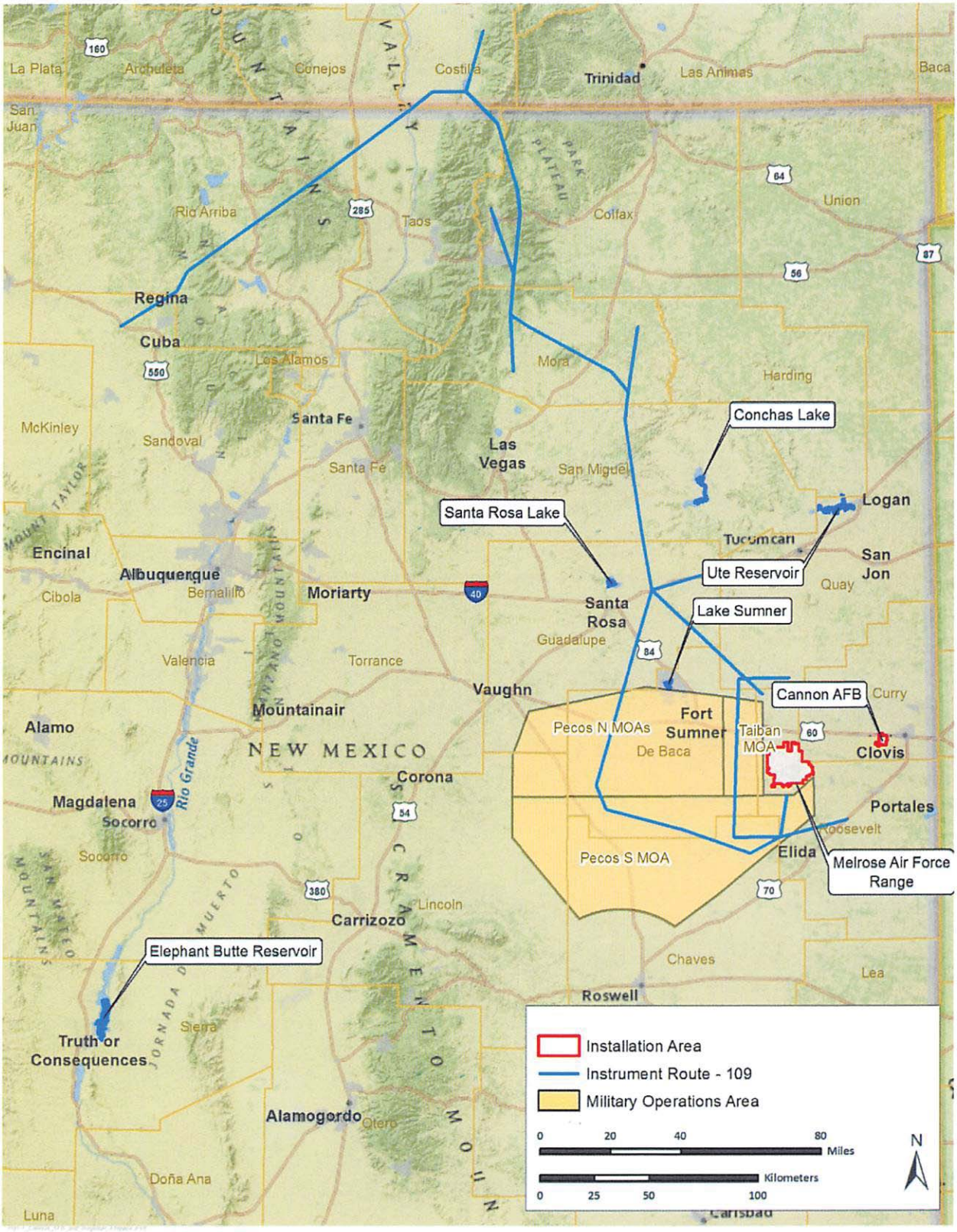
David E. Schnabel

DAVID E. SCHNABEL, P.E.
Deputy Commander, 27 SOCES

Enclosures:

1. Project Figures
2. Data Tables

## Attachment 1A: Regional Location Map




Data Source: National Geographic, Cannon AFB GIS 2017

## Attachment 1B: Project Location Map on Cannon AFB

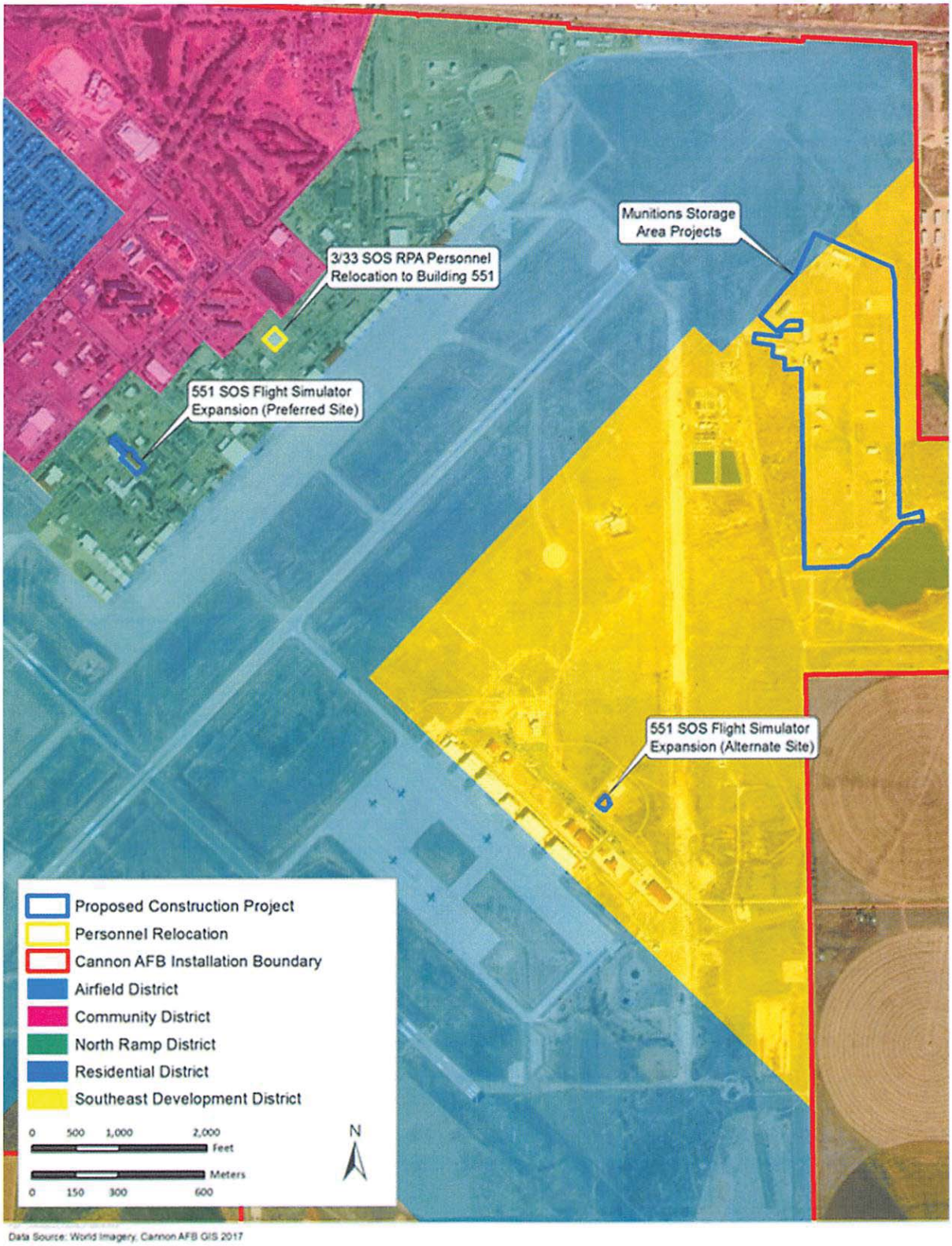



**Table 1. Total Aircraft, Personnel, and Training Increases through 2026 under the Proposed Action**

| Component | Maximum Additional Interim Aircraft | End-State Additional Aircraft | Maximum Interim Additional Authorized Personnel Increase | End-State Additional Authorized Personnel Increase | Maximum Interim Additional Annual Flying Hours[1] | End-State Additional Annual Flying Hours |
|---|---|---|---|---|---|---|
| 9 SOS | 9 | 2 | 157[2] | 132[2] | 928 | 424 |
| 12/3/33 SOS | 0 | 0 | 85 | 85 | 626 | 626[4] |
| 16 SOS | 4 | 4 | 0 | 0 | 606 | 606 |
| 27 SOS | 0 | 0 [3] | 0 | 0 | 102 | 102 |
| 551 SOS | - | - | 0 | 0 | - | - |
| 27 SOMXS | - | - | 0 | 0 | - | - |
| **Total** | 13 | 6 | 242 | 217 | 2,262 | 1,758 |

[1] The increase in hours per year is commensurate with the increase in personnel.

[2] Personnel increase number includes additional 100 Aircraft Maintenance Unit personnel as well as flight crews and instructors for the 551 SOS.

[3] CV-22s to be used for water safety training are already stationed at Cannon AFB.

**Table 2. Project Area and Change in Impervious Surfaces**

| Component Action | Construction ($ft^2$) | Demolition ($ft^2$) | Total Building Space ($ft^2$) | Change in Impervious Surface ($ft^2$) |
|---|---|---|---|---|
| 9 SOS | n/a | n/a | n/a | n/a |
| 12 SOS | n/a | n/a | n/a | n/a |
| 16 SOS | n/a | n/a | n/a | n/a |
| 27 SOS | n/a | n/a | n/a | n/a |
| 551 SOS | 13,000 | n/a | 13,000 | 13,000 |
| 27 SOMXS | 48,300 | 18,400 | 41,300 | 27,900 |
| Total | 61,300 | 18,400 | 54,300 | 40,900 |

Note: Changes in impervious surfaces are not necessarily equivalent to the project area square footage because some facilities proposed for demolition are multiple stories, and many new facilities would be multiple stories. Furthermore, some infrastructure improvement projects would disturb an area but not add impervious surfaces. Additionally, not all demolition projects would result in a change in impervious surface because the sites of some would be redeveloped.

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS CIVIL ENGINEER SQUADRON (AFSOC)
CANNON AIR FORCE BASE, NEW MEXICO

MAR 15 2019

David E. Schnabel, P.E.
Deputy Commander, 27 SOCES
506 North Air Commando Way
Cannon AFB, NM 88103

Dr. Benjamin Tuggle
Regional Director
U.S. Fish and Wildlife Service, Southwest Region
PO Box 1306
Albuquerque, NM 87103

Dear Dr. Tuggle

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. In accordance with Section 7 of the Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), the Air Force and the 27th Special Operations Wing (27 SOW), headquartered at Cannon AFB, New Mexico, respectfully request your concurrence on the determination that potential environmental impacts associated with aircraft realignment and beddown activities may affect, but are not likely adversely affect the following species: least tern (*Sterna antillarum*), whooping crane (*Grus americana*), and Arkansas river shiner (*Notropis girardi*).

For this consultation, the Air Force has integrated the requirements of the National Environmental Policy Act and ESA so that all procedures run concurrently. As such, in accordance with 50 CFR Section 402.06(a), Air Force intends to have the EA stand as the Biological Assessment for threatened and endangered species that could be affected by the project.

**Proposed Action**

As part of the Proposed Action, the Air Force would include increases in personnel, aircraft, and training levels; demolition; and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs include:

1) Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with additional aircraft and training activities in existing training areas (military operations areas and Instrument Route-109).

2) Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3) Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft and training activities in existing training areas.
4) Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5) Construction of an additional 551 SOS flight simulator bay on Cannon AFB.
6) Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB.

Location maps for the projects are presented in Attachment 1.

**Threatened, Endangered, and Candidate Species and Critical Habitat**

The Cannon AFB Integrated Natural Resource Management Plan (INRMP) and the USFWS Information for Planning and Consultation System (IPaC Consultation Code: 02ETAU00-2018-SLI-1117) were reviewed to determine if any federally-listed species potentially occur in the vicinity of the Proposed Action. The following species are federally listed and have the potential to occur on Cannon AFB, Melrose AFR, or Ute Reservoir (Table 1).

**Table 1: Federally Listed Species with the Potential to Occur on Cannon AFB, Melrose AFR, or Ute Reservoir**

| Common Name | Scientific Name | Status | Preferred Habitat |
|---|---|---|---|
| Least Tern | *Sterna antillarum* | E | Nests along sand and gravel bars within braided streams, rivers |
| Arkansas River Shiner** | *Notropis girardi* | T | Turbid waters of broad, shallow, unshaded channels and small to large rivers, over mostly silt and shifting and bottoms. Tends to congregate on the downstream side of large transverse sand ridges. Spawning occurs in main stream channels |

Notes:
E = Endangered; T = Threatened
*Melrose AFR only.
**Ute Reservoir only.

The Proposed Action may affect, but is not likely to adversely affect federally listed species. Although no listed or candidate species have been recorded on or near the proposed action area, the proposed action area does provide suitable habitat for one bird species (least tern) and one fish species (Arkansas river shiner). The aircraft realignment and beddown activities at Cannon AFB involve an increase of a maximum of two training flights per night along a previously established military training route (Instrument Route-109) at altitudes as low as 300 feet above ground level (AGL). These 3- to 5- hour flights will typically occur after dark Monday through Friday. Bird/wildlife aircraft strike hazard (BASH) incidents and noise would be the primary concerns for impacts on listed species. Estimated noise levels associated with the Proposed Action beneath the IR would be expected to increase; however, they would not be

sufficient to generate 65 dBA DNL noise contours at 300 feet AGL. Species along IR-109 are likely habituated to some human activity and ambient noise due to the existing military activities, including the Air Force aircraft operations that currently occur there and are not likely to adversely affect the nesting habits of federally listed avian species. Bird strikes are unlikely, as the average flight heights of most of the federally listed species that inhabit areas below IR-109 do not extend to 300 feet above ground level. The nocturnal occurrence of the training flights limits the opportunity for aircrafts and bird flights to coincide.

27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir may affect, but is unlikely to adversely affect the Arkansas river shiner. SERE water safety tranining involves boat engine emissions and approved dye markers designed to mark open water rescue locations. The Arkansas river shiner would be accustomed to boat engine emissions already occurring from ongoing SERE operations and from recreational vehicles frequently occupying the lake. The approved dye markers would be non-toxic to the general wildlife in the lake and, therefore, would be unlikely to adversely affect the specific genetics of the Arkansas river shiner. Expansion of flight simulators and upgrades to the Cannon AFB munitions storage area would have no effect on listed species.

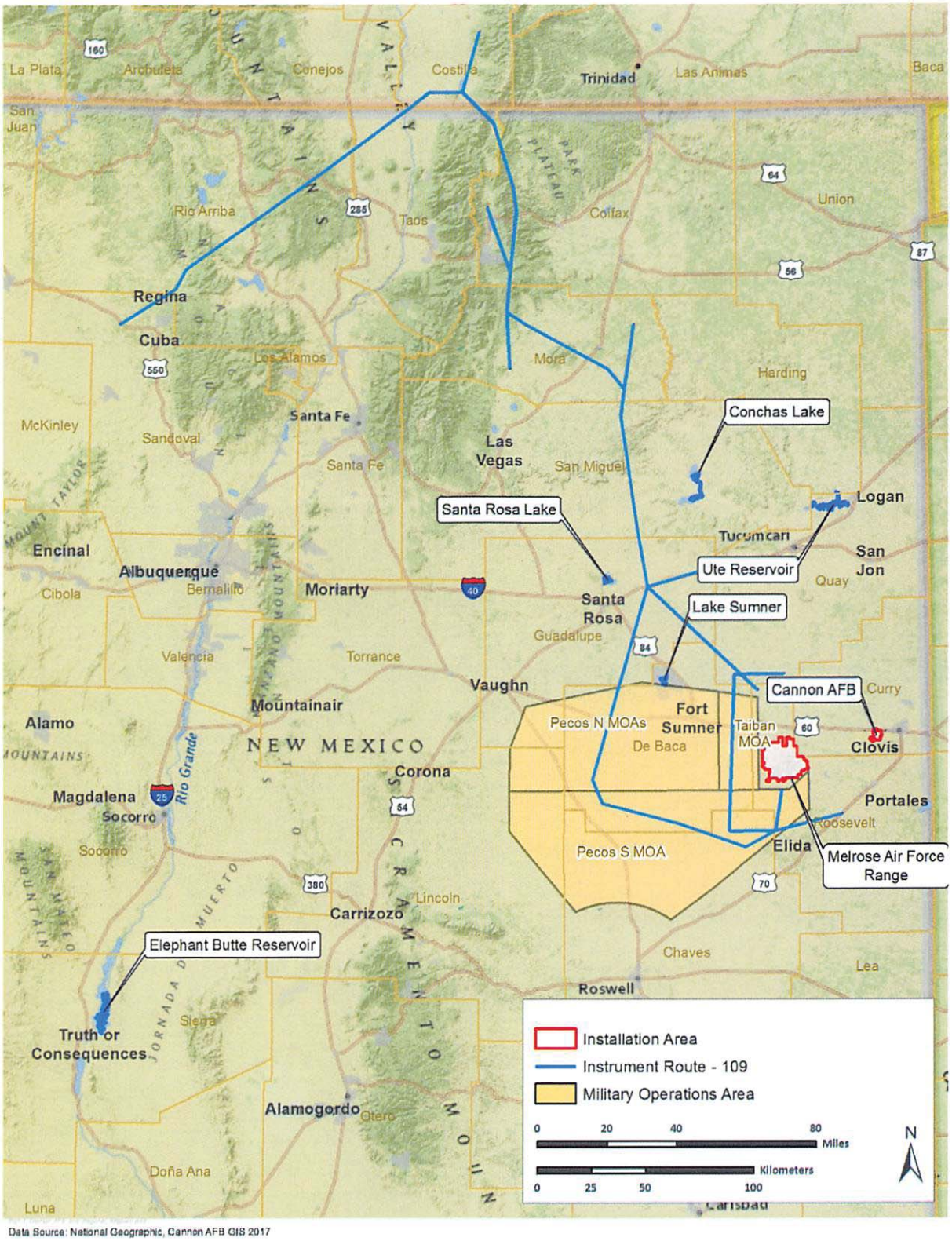
Therefore, the Air Force has determined the aircraft realignment and beddown activites may affect, but are not likely to adversely affect, the least tern and Arkansas river shiner. We request written concurrence with our determination as part of the informal consultation process. If you have any questions or concerns, please contact Ms. Crystal Chavez at (575) 904-6736 or crystal.chavez@us.af.mil. Thank you in advance for your assistance in this effort.

Sincerely

DAVID E. SCHNABEL, P.E.
Deputy Commander, 27 SOCES

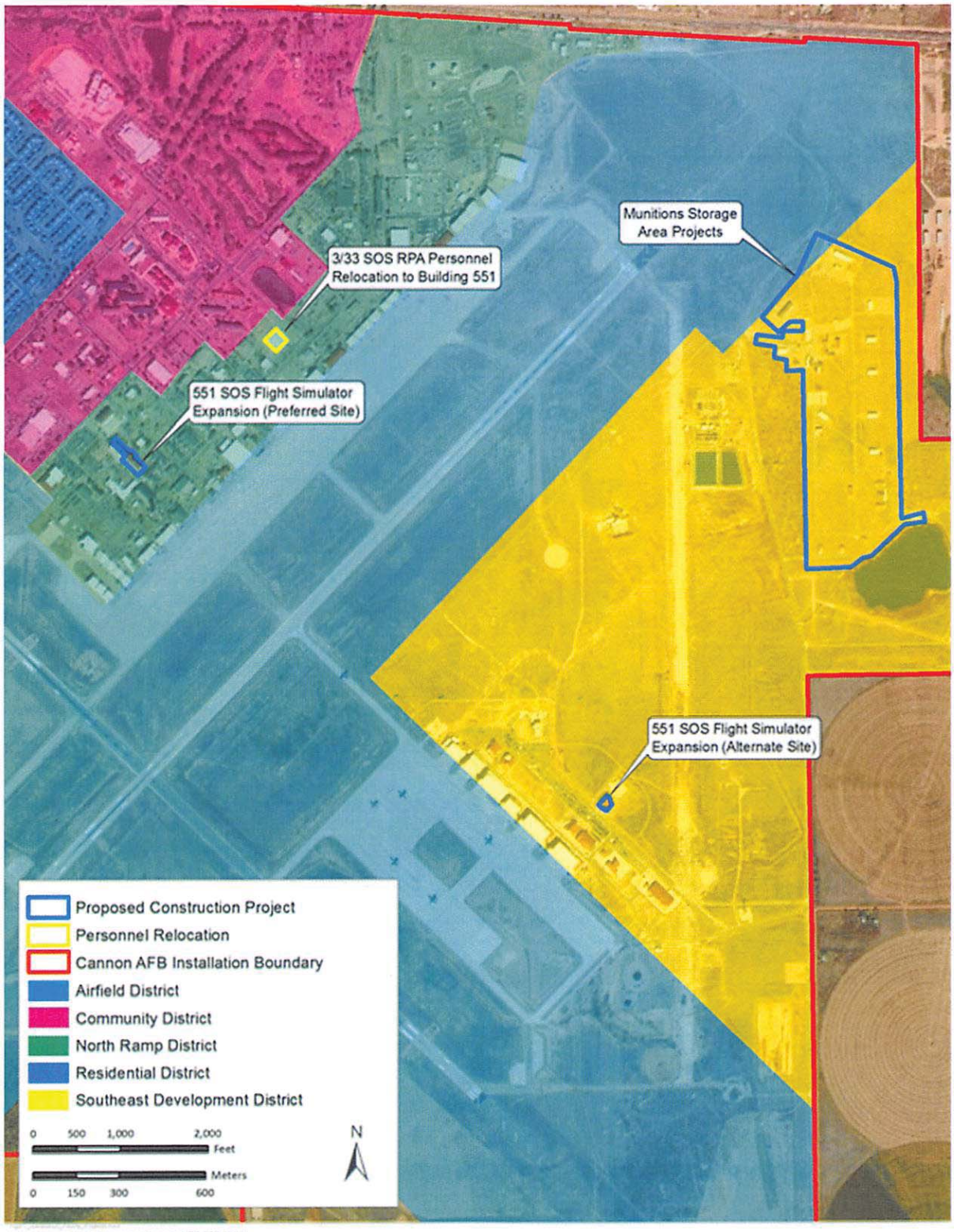
Attachments:
1. Maps of Proposed Action Area

# Attachment 1A: Regional Location Map




Data Source: National Geographic, Cannon AFB GIS 2017

## Attachment 1B: Project Location Map on Cannon AFB




Data Source: World Imagery, Cannon AFB GIS 2017

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS CIVIL ENGINEER SQUADRON (AFSOC)
CANNON AIR FORCE BASE, NEW MEXICO

MAR 15 2019

David E. Schnabel, P.E.
Deputy Commander, 27 SOCES
506 North Air Commando Way
Cannon AFB, NM 88103

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

Dear Dr. Pappas

The United States Air Force (Air Force) is proposing aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. To take into account various environmental concerns, the Air Force is engaging early with the appropriate resource and regulatory agencies as it formulates the undertaking. The Air Force is also preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the Aircraft Realignment and Beddown Activities for Cannon AFB.

In accordance with Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, the Air Force, Cannon AFB, is advising you of a proposed undertaking that has the potential to affect historic properties. The undertaking would require increases in personnel, aircraft, and training levels; demolition; and facility construction to support the Cannon AFB mission.

Cannon AFB seeks to improve its understanding of the potential environmental consequences associated with the realignment and beddown process by evaluating the proposed projects in a single EA. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs include:

1) Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft end state (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2) Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3) Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4) Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month
5) Construction of an additional 551 SOS flight simulator bay on Cannon AFB and expansion of either Building 724 or Building 4675 with a new annex.

6) Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB through the demolition of six facilities and replacement with seven new facilities.

The Area of Potential Effect (APE) for this undertaking is defined as the facility project areas for component actions 5 and 6 where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. Component actions 1 through 4 do not have potential to affect historic properties, as they consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces.

Cannon AFB has conducted both archaeological and architectural surveys within the APE and determined no historic properties are present. Eight buildings are in the APE: 724, 2110, 2122, 2125, 2126, 2127, 2143, and 4675. Six buildings were evaluated as not eligible for listing in the National Register of Historic Places (NRHP) in 2006 by Geo-Marine, Inc. (Buildings 2110, 2122, 2125, 2126, 2127, 2143). The remaining two buildings are modern facilities built after the survey and have not achieved outstanding historic significance. Proposed construction would occur in developed portions of the installation, and previously undiscovered archaeological resources are unlikely to be present.

Pursuant to 36 CFR §800.4(d), the Air Force has determined that no historic properties will be affected by the Aircraft Realignment and Beddown Activities for Cannon AFB. We request your comment and/or concurrence on the finding of No Historic Properties Affected. If we do not receive your comments and/or concurrence within the required 30 days we will assume concurrence and proceed with the undertaking as described. Cannon AFB is consulting with the Apache Tribe of Oklahoma, Comanche Nation of Oklahoma, Kiowa Tribe of Oklahoma, Jicarilla Apache Nation, and Mescalero Apache Tribe, regarding the Proposed Action and the identification and evaluation of historic properties of traditional or religious significance. If any historic properties are identified in the APE during this tribal consultation, Cannon AFB will notify your office and continue consultation at that time.

Please contact Ms. Crystal Chavez at crystal.chavez@us.af.mil; or 506 North Commando Way, Cannon AFB, New Mexico 88103 if you have any questions.

Sincerely

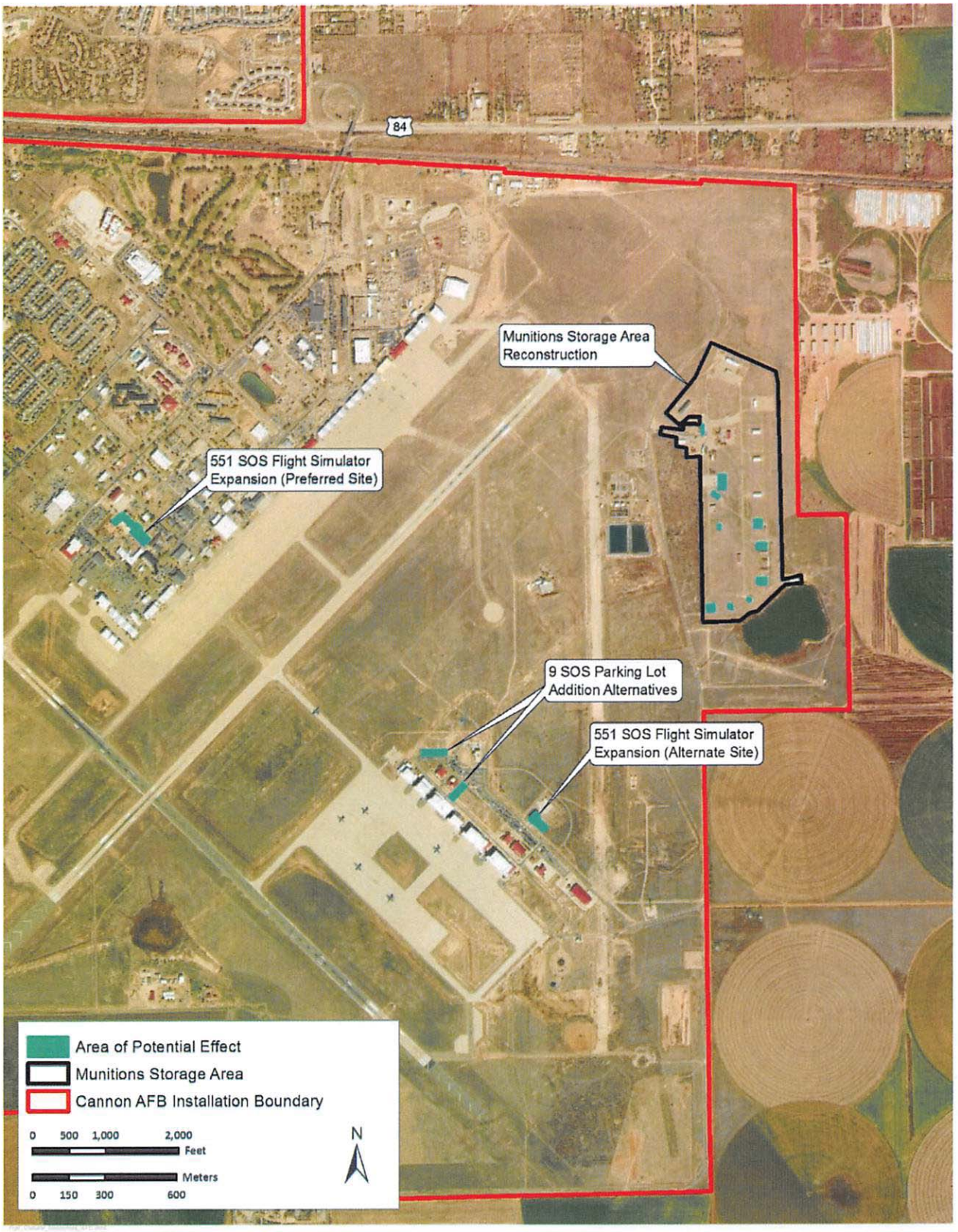
David E. Schnabel

DAVID E. SCHNABEL, P.E.
Deputy Commander, 27 SOCES

Attachments:

1. Area of Potential Effects Figure

# Attachment 1: APE Figure




Data Source: World Imagery, Cannon AFB GIS 2017

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Mr. Bobby Comardley
Apache Tribe of Oklahoma
P.O. Box 1220
Andarko OK 73005

Dear Chairman Comardley

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect historic properties. The remaining actions consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing

airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Apache Tribe of Oklahoma.

If you have any questions, please contact Ms. Crystal Chavez at crystal.chavez@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

28 FEB 2019

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

Mr. William Nelson
Comanche Nation of Oklahoma
P.O. Box 908
Lawton OK 73502

Dear Chairman Nelson

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect historic properties. The remaining actions consist of either: 1) increases or changes in aircraft

with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Comanche Nation of Oklahoma.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Ms. Martina Callahan
Tribal Historic Preservation Officer
Comanche Nation of Oklahoma
P.O. Box 908
Lawton OK 73502

Dear Ms. Callahan

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect

historic properties. The remaining actions consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Comanche Nation of Oklahoma.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Mr. Wainwright Velarde
Jicarilla Apache Nation
P.O. Box 507
Dulce NM 87528

Dear President Velarde

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect historic properties. The remaining actions consist of either: 1) increases or changes in aircraft

with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Jicarilla Apache Nation.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Mr. Jeffrey Blythe
Tribal Historic Preservation Officer
Jicarilla Apache Nation
P.O. Box 507
Dulce NM 87528

Dear Mr. Blythe

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect

historic properties. The remaining actions consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Jicarilla Apache Nation.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Mr. Mathew Komalty
Kiowa Tribe of Oklahoma
P.O. Box 369
Carnegie OK 73015

Dear Chairman Komalty

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect historic properties. The remaining actions consist of either: 1) increases or changes in aircraft

with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Kiowa Tribe of Oklahoma.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Ms. Kellie J. Poolaw
Acting Tribal Historic Preservation Officer
Kiowa Tribe of Oklahoma
P.O. Box 369
Carnegie OK 73015

Dear Ms. Poolaw

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect

historic properties. The remaining actions consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Kiowa Tribe of Oklahoma.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

28 FEB 2019

Mr. Denny Breuninger, Sr.
Mescalero Apache Tribe
P.O. Box 227
Mescalero NM 88340

Dear President Breuninger

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect historic properties. The remaining actions consist of either: 1) increases or changes in aircraft

with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Mescalero Apache Tribe.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS WING (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

28 FEB 2019

Colonel Nathan L. Owendoff
Commander
100 Air Commando Way, Suite 100
Cannon AFB NM 88103

Ms. Holly Houghton
Tribal Historic Preservation Officer
Mescalero Apache Tribe
P.O. Box 227
Mescalero NM 88340

Dear Ms. Houghton

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) and 36 CFR Part 800, *Protection of Historic Properties*, the USAF is engaging early with tribal governments as it formulates the undertaking.

As part of the proposed undertaking, the aircraft realignment and beddown activities at Cannon AFB include increases in personnel, aircraft, training levels, demolition, and facility construction. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs are described below and location maps for the projects are presented in the attached enclosures.

1. Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2. Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3. Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4. Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month.
5. Construction of an additional 551 SOS flight simulator bay on Cannon AFB; expansion of either Building 724 or Building 4675 with a new annex.
6. Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB. Demolition of six facilities and replacement with seven new facilities.

The Proposed Action is an undertaking subject to Section 106 of the NHPA. Of the six component actions under the Proposed Action, items five and six have the potential to affect

historic properties. The remaining actions consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces. The Area of Potential Effects (APE) for the Proposed Action is defined as the facility project areas for component actions five and six where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. All proposed construction areas have been surveyed. Proposed construction would also occur in developed portions of the installation and previously undiscovered archaeological resources are unlikely to be present.

In accordance with the NHPA, the USAF would like to initiate government-to-government consultation regarding the aircraft realignment and beddown activities at Cannon AFB. The USAF requests your input in identifying any issues or areas of concern you feel should be addressed in the environmental analysis. Additionally, please let us know if you believe this undertaking might adversely affect any historic properties of religious and cultural significance to the Mescalero Apache Tribe.

If you have any questions, please contact Dr. Linda Tello at linda.tello.1@us.af.mil; or 27th Special Operations Civil Engineer Squadron, 506 North Commando Way, Cannon AFB, New Mexico 88103. Comments are respectfully requested within 30 days from the date of receipt of this correspondence. Thank you in advance for your assistance in this effort.

Sincerely

NATHAN L. OWENDOFF, Colonel, USAF
Commander

2 Attachments:
1. Project Location Map
2. Area of Potential Effects Map

**City Manager**
JUSTIN A. HOWALT, P.E.

**Assistant City Manager**
CLAIRE H. BURROUGHES

**City Attorney**
DAVID F. RICHARDS

Post Office Box 760
Clovis, New Mexico 88101-0760
Phone (575) 769-7828



March 21, 2019

Ms. Crystal Chavez
27th Special Operations Civil Engineer Squadron
506 North Commando Way
Cannon AFB NM 88103

**Re: Environmental Assessment (EA) Addressing Aircraft Realignment and Beddown Activities at Cannon Air Force Base, New Mexico**

Dear Ms. Chavez;

I write further to Lt. Colonel David E. Schnabel's Memorandum for Distribution dated March 15, 2019. Thank you for sharing the information regarding the above. The City of Clovis is excited to see projected expansion in operations related to Cannon in order to continue the Cannon AFB mission through 2026.

The City of Clovis has no comment in regard to the environmental review. The City of Clovis notes the programs listed would update similar activities identified in the 2007 Environmental Impact Statement for AFSOC Assets Beddown at Cannon AFB, include increases in personnel, aircraft, and training levels; demolition; and facility construction.

Yours sincerely,

Justin A. Howalt
City Manager

**SHERMAN McCORKLE**
*Chairman & CEO*
**SANDIA SCIENCE & TECHNOLOGY PARK DEVELOPMENT CORPORATION**

1451 Innovation Parkway SE, Suite 600 • Albuquerque, NM 87123
Sherman@smccorkle.org • 505.235.8719

April 5, 2019

Ms. Crystal Chavez
27th Special Operations Civil Engineer Squadron
506 North Commando Way
Cannon AFB, New Mexico 88103

Dear Ms. Chavez:

On behalf of the Military Base Planning Commission, I am responding to your March 15 letter to the Director, Office of Military Base Planning and Support on the planned Cannon AFB Environmental Assessment (EA). As you may know, the Military Base Planning Commission was intensely involved in the original Cannon AFB Environmental Impact Statement supporting beddown of the 27th Special Operations Wing (SOW).

However, for the last 11 years or so, we have followed closely the evolving Special Operations mission at Cannon AFB and Melrose Air Force Range (MAFR). We provided the leadership and resources to expand MAFR by approximately 11,000 acres, working closely with the New Mexico State Land Office and other authorities, including HQ USAF, Air Force Special Operations Command, the Air Force Real Property Agency; and the Air Force Civil Engineer Center. We also gifted 571 acres of land on the western boundary of Cannon in support of Air Force priorities. Most recently, we developed the Contract between the State of New Mexico and The Conservation Fund in support of the ongoing REPI project, and we have engaged with State DOT on the new entrance to MAFR.

In our view, the pending Environmental Assessment should be a comprehensive statement of current and planning projects at Cannon AFB **and** MAFR. The last time we were asked to comment on a Cannon EA, we mentioned that MAFR appeared to have been left out of the process—as it is with your letter. Further, it does not appear that past Cannon NEPA actions have fully described 27th SOW force growth, for example CV-22s and related operations.

Though NEPA does not mandate public EA outreach sessions, we strongly recommend the 27th SOW plan several appropriate opportunities for interested communities to be informed on ongoing operations and future projects.

We appreciate the opportunity to comment—please let me know if I can provide additional information.

Sincerely,

Sherman McCorkle
Member, Military Base Planning Commission

**NEW MEXICO**
**ENVIRONMENT DEPARTMENT**

Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
Santa Fe, NM 87502-5469
Telephone (505) 827-2855
www.env.nm.gov

***Michelle Lujan Grisham***
Governor

***Howie C. Morales***
Lt. Governor

***James C. Kenney***
Cabinet Secretary

***Jennifer J. Pruett***
Deputy Secretary

April 3, 2019

Crystal Chavez
27th Special Operations Civil Engineer Squadron
506 North Commando Way
Cannon AFB, NM 88103
By email: crystal.chavez@us.af.mil

Dear Ms. Chavez,

The New Mexico Environment Department (NMED) has reviewed the scoping letter for the proposed Cannon AFB Aircraft Realignment and Beddown Activities and offers the following comments:

**NMED Air Quality Bureau Comments**

If a stand by electrical generator is used at the facility, be advised that records should be kept of the hours of operation of the generator. An application for a construction permit must be submitted for stand by generators used 500 hours per year or more.

To further ensure air quality standards are met, applicable local or county regulations requiring noise and/or dust control must be followed; if none are in effect, controlling construction-related air quality impacts during projects should be considered to reduce the impact of fugitive dust and/or noise on community members.

Potential exists for temporary increases in dust and emissions from earthmoving, construction equipment, and other vehicles; however the increases should not result in non-attainment of air quality standards. Dust control measures should be taken to minimize the release of particulates due to vehicular traffic and construction. Areas disturbed by the construction activities, within and adjacent to the project area should be reclaimed to avoid long-term problems with erosion and fugitive dust.

All asphalt, concrete, quarrying, crushing and screening facilities contracted in conjunction with the proposed project must have current and proper air quality permits. For more information on air quality permitting and modeling requirements, please refer to 20.2.72 NMAC.

If air quality permits are required for the proposed action, permits will need to be administered by the New Mexico Environment Department (NMED).

**NMED Ground Water Quality Bureau Comments**

Cannon AFB is authorized to receive and treat up to 1,500,000 gpd of domestic wastewater using a mechanical WWTP in accordance with Discharge Permit 873 (DP-873) of the NMED GWQB. Modifications including the quantity or quality of wastewater received at Cannon Air Force Base Wastewater Treatment Plant must be done in accordance with the terms and conditions outlined in DP-873.

The proposed project is not expected to have any adverse impacts on ground water quality in the area of the project. However, implementation of the project may involve the use of heavy equipment, thereby leading to a possibility of contaminant releases (e.g., fuel, hydraulic fluid, etc.) associated with equipment malfunctions. The GWQB advises all parties involved in the project to be aware of notification requirements for accidental discharges contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will further ensure the protection of ground water quality in the vicinity of the project.

A copy of the Ground and Surface Water Protection Regulations, 20.6.2 NMAC, is available at http://164.64.110.239/nmac/parts/title20/20.006.0002.pdf.

**NMED Hazardous Waste Bureau Comments**

Cannon Air Force Base (Cannon AFB) was issued a renewed permit on December 19, 2018 and became effective on January 18, 2019 for corrective action activities. The munitions storage area on the map provided in the EA includes an Area of Concern (AOC GGG) which listed on the Cannon AFB Resource Conservation and Recovery Act Permit on Table 1 of Attachment 3 Solid Waste Management Units and Areas of Concern Requiring Corrective Action. Should AOC GGG be affected by activities address in the EA, information should be gathered to assist in future investigative work to determine the nature and extent of contamination at this AOC. Corrective action at this site is currently deferred due to ongoing activities.

**NMED Petroleum Storage Tank Bureau Comments**

At Building 551 there is an e-generator AST FID# **54817 551st SOS (Tank 622), TID# 38383.**

The 551 SOS Flight Simulator Expiation (Alternate Site) one facility in close proximity FID# 54843 Aircraft Maint Squadron (GPMX) (Tank 44617), 128 South Dagger (bldg. 4617). TID# 38494

Melrose (Bombing) Air Force Range FID# 53072 Tank 3153 (Fire Department), Facility 3153 (Melrose AFB Bombing Range), TID# 36241. Scheduled to be closed and a new tank installed at another site on the same Range. We do not have a date on that project.

**Any demolition of these buildings may cause a closure of the tank systems at these sites. Proper notification would be required at that time in order to give the department time to attend all critical junctures.**

**PSTB Release Sites:**

At this time there are 9 active current release sites either in Cleanup or Investigation Phase listed below. The release sites are not shown on the Go NM OpenEnviroMap as there are no specific addresses, only building names. Any information needed will have to be obtained from the project manager on list provided, Jim Gibb at 505-476-4387 or jim.gibb@state.nm.us.

| Release ID | Release Name | Facility ID | Facility Name | Address | City | Responsible Party | Project Manager | Compliance? | Release Status |
|---|---|---|---|---|---|---|---|---|---|
| 843 | FACILITY 392 | 30977 | TANK 392 A | FACILITY 392 A | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | UNKNOWN | | No Further Action, Confirmed Release |
| 2398 | 1402 SEWAGE LIFT STA | 30940 | TANK 1402 | FACILITY 1402 | CANNON AFB | US AIR FORCE FB4855 - CANNON AFB,US AIR FORCE KIRTLAND AFB - TRANSORTATION | UNKNOWN | | Referred to Ground Water Quality Bureau |
| 2415 | FACILITY #1400-HOSPITAL | 30938 | TANK 1400 A | FACILITY 1400 A | CANNON AFB | US AIR FORCE FB4855 - CANNON AFB | JIM GIBB | | Investigation Federal Facility |
| 2432 | BLDG/FAC 2110 | 30948 | TANK 2110 | FACILITY 2110 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Cleanup, Federal Facility |
| 2434 | BLDG 10 | 30933 | TANK 10 | FACILITY 10 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Cleanup, Federal Facility |
| 2439 | FACILITY 728 | 30990 | TANK 728 | FACILITY 728 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Investigation Federal Facility |
| 2445 | BLDG 600 | 30989 | TANK 600 | FACILITY 600 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Investigation Federal Facility |
| 2500 | FACILITY #3060 | 30964 | TANK 3060 | FACILITY 3060 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Investigation Federal Facility |
| 2520 | FACILITY 130 | 30935 | TANK 130 | FACILITY 130 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Investigation Federal Facility |
| 2529 | BLDG 368 | 30970 | TANK 368 A | FACILITY 368 A | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Investigation Federal Facility |
| 2530 | BLDG 2285 | 30953 | TANK 2285 | FACILITY 2285 | CANNON AFB | US AIR FORCE KIRTLAND AFB - TRANSORTATION | JIM GIBB | | Investigation Federal Facility |

**NMED Surface Water Quality Bureau Comments**

**NPDES Construction General Permit**

The U.S. Environmental Protection Agency (USEPA) administers the National Pollutant Discharge Elimination System (NPDES) program under Section 402 of the Federal Clean Water Act (CWA) in the State of New Mexico. Any "construction activity" that will disturb, or that is part of a common plan of development or sale that will disturb, one or more acres of land and discharges stormwater to waters of the U.S. must obtain NPDES Construction General Permit (CGP) coverage. The CGP was re-issued January 11, 2017 effective February 16, 2017 and includes requirements for endangered species and historic properties, and additional state and tribal requirements in Part 9 of the permit.

Information on jurisdictional determinations for waters of the U.S. under the Clean Water Act can be found at: https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/Jurisdiction/

An "operator" is any party associated with a construction project that meets either of the following two criteria: The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or the party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions. Where there are multiple operators associated with the same project, all operators must obtain permit coverage.

Among other things, the CGP requires that a SWPPP be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures, and permanent storm water management measures be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters. In addition, permittees must ensure that there is no increase in sediment yield and flow velocity from the construction site (both during and after construction) compared to pre-construction, undisturbed conditions.

More information on the CGP as well as links to the eReporting tool (NeT-CGP) to apply for coverage or waivers is available at: https://www.epa.gov/npdes/2017-construction-general-permit-cgp.

Thank you for providing NMED with the opportunity to review and comment on this proposed project.

Sincerely,

Michaelene Kyrala
Director of Policy
New Mexico Environment Department
Office: 505.827.2892
E-mail: michaelene.kyrala@state.nm.us

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS CIVIL ENGINEER SQUADRON (AFSOC)
CANNON AIR FORCE BASE, NEW MEXICO

MAR 15 2019

David E. Schnabel, P.E.
Deputy Commander, 27 SOCES
506 North Air Commando Way
Cannon AFB, NM 88103



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

Dear Dr. Pappas

The United States Air Force (Air Force) is proposing aircraft realignment and beddown activities at Cannon Air Force Base (AFB), New Mexico. To take into account various environmental concerns, the Air Force is engaging early with the appropriate resource and regulatory agencies as it formulates the undertaking. The Air Force is also preparing an Environmental Assessment (EA) under the National Environmental Policy Act to evaluate potential environmental impacts associated with the Aircraft Realignment and Beddown Activities for Cannon AFB.

In accordance with Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, the Air Force, Cannon AFB, is advising you of a proposed undertaking that has the potential to affect historic properties. The undertaking would require increases in personnel, aircraft, and training levels; demolition; and facility construction to support the Cannon AFB mission.

Cannon AFB seeks to improve its understanding of the potential environmental consequences associated with the realignment and beddown process by evaluating the proposed projects in a single EA. Six component actions under the Proposed Action require updating from the current baseline in order to continue the Cannon AFB mission through 2026. These programs include:

1) Expansion of the 9 Special Operations Squadron (SOS) MC-130J cargo aircraft mission with an additional two aircraft end state (maximum interim increase of nine aircraft) and associated training activities. Addition of parking lot near Building 4624.
2) Increase in the number of 12/3/33 SOS MQ-9 Reaper remotely piloted aircraft personnel from 315 to 400.
3) Upgrade of the 16 SOS AC-130W gunship aircraft to AC-130J and increase in number of aircraft from 12 to 16.
4) Use of CV-22 Osprey tiltrotor aircraft during 27 SOS Survival, Evasion, Rescue, and Escape (SERE) water safety training at Ute Reservoir up to two times a month
5) Construction of an additional 551 SOS flight simulator bay on Cannon AFB and expansion of either Building 724 or Building 4675 with a new annex.

6) Upgrades to the 27 Special Operations Maintenance Squadron munitions storage area on Cannon AFB through the demolition of six facilities and replacement with seven new facilities.

The Area of Potential Effect (APE) for this undertaking is defined as the facility project areas for component actions 5 and 6 where building demolition, renovation, expansion, or new construction would occur. These areas total 219,130 square feet (5.0 acres) and are shown in the attached APE figure. Component actions 1 through 4 do not have potential to affect historic properties, as they consist of either: 1) increases or changes in aircraft with no changes in facilities, airspace, or perceptible noise; or 2) aircraft operations in existing airspace over water areas with no disturbance of ground surfaces.

Cannon AFB has conducted both archaeological and architectural surveys within the APE and determined no historic properties are present. Eight buildings are in the APE: 724, 2110, 2122, 2125, 2126, 2127, 2143, and 4675. Six buildings were evaluated as not eligible for listing in the National Register of Historic Places (NRHP) in 2006 by Geo-Marine, Inc. (Buildings 2110, 2122, 2125, 2126, 2127, 2143). The remaining two buildings are modern facilities built after the survey and have not achieved outstanding historic significance. Proposed construction would occur in developed portions of the installation, and previously undiscovered archaeological resources are unlikely to be present.

Pursuant to 36 CFR §800.4(d), the Air Force has determined that no historic properties will be affected by the Aircraft Realignment and Beddown Activities for Cannon AFB. We request your comment and/or concurrence on the finding of No Historic Properties Affected. If we do not receive your comments and/or concurrence within the required 30 days we will assume concurrence and proceed with the undertaking as described. Cannon AFB is consulting with the Apache Tribe of Oklahoma, Comanche Nation of Oklahoma, Kiowa Tribe of Oklahoma, Jicarilla Apache Nation, and Mescalero Apache Tribe, regarding the Proposed Action and the identification and evaluation of historic properties of traditional or religious significance. If any historic properties are identified in the APE during this tribal consultation, Cannon AFB will notify your office and continue consultation at that time.

Please contact Ms. Crystal Chavez at crystal.chavez@us.af.mil; or 506 North Commando Way, Cannon AFB, New Mexico 88103 if you have any questions.

Sincerely

No Historic Properties Affected
John R Eppler April 3, 2019
for NM State Historic Preservation Office

David E. Schnabel
DAVID E. SCHNABEL, P.E.
Deputy Commander, 27 SOCES

Attachments:

1. Area of Potential Effects Figure

**United States Department of the Interior**
**Bureau of Indian Affairs**
**Southwest Region**
1001 Indian School Road N.W.
Albuquerque, New Mexico 87104-2303

TAKE PRIDE IN AMERICA

In Reply Refer To:
620-Division of Environmental, Safety,
and Cultural Resources Management

MAY 0 3 2019

Ms. Crystal Chavez
NEPA Program Manager
27th Special Operations Civil Engineer Squadron
506 North Commando Way,
Cannon Air Force Base (AFB), NM 88103

Dear Ms. Chavez:

Our office has received your request for information regarding the preparation of an Environmental Assessment (EA) Addressing Aircraft Realignment and Beddown Activities at Cannon AFB, New Mexico. We appreciate that the United States Air Force (USAF) and Special Operations Wing (SOW) acknowledges its trust responsibility in contacting the Bureau of Indian Affairs (BIA) on a government-to-government basis regarding environmental issues for the fore mentioned proposed project. It is our understanding that the Section 106 of the National Historic Preservation Act (NHPA) compliance will be completed for the proposed action by USAF.

As is, the proposed action does not impact any trust resources under the jurisdiction of the BIA. Therefore, at this time we do not have any comments. However, we do request that USAF consult with any local Pueblo or Tribe regarding Section 106 consultation of NHPA.

Thank you for the opportunity to participate and comment on the proposed action. If you have any questions or concerns, please contact Mrs. Priscilla J Avila at (505) 563-3417.

Sincerely,

Acting Regional Director

# COMANCHE NATION

27th Special Operations Wing (AFSOC)
Attn: Dr. Linda Tello
506 North Commando Way
New Mexico 88103

June 3, 2019

Re: The Aircraft Realignment and Beddown Activities at Canon AFB Include Increases in Personnel, aircraft, Training levels, Demolition, and Facility Construction

Dear Dr. Tello:

In response to your request, the above reference project has been reviewed by staff of this office to identify areas that may potentially contain prehistoric or historic archeological materials. The location of your project has been cross referenced with the Comanche Nation site files, where an indication of ***"No Properties"*** have been identified. (IAW 36 CFR 800.4(d)(1)).

Please contact this office at (580) 595-9960/9618) if you require additional information on this project.

This review is performed in order to identify and preserve the Comanche Nation and State cultural heritage, in conjunction with the State Historic Preservation Office.

Regards

Comanche Nation Historic Preservation Office
Theodore E. Villicana , Technician
#6 SW "D" Avenue, Suite C
Lawton, OK. 73502



COMANCHE NATION P.O. BOX 908 / LAWTON, OK 73502
PHONE: 580-492-4988 TOLL FREE:1-877-492-4988

*This page intentionally left blank.*

# B

# Land Use Compatibility Guidelines

The U.S. Air Force land use guidelines for noise exposure are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, Guidelines for Considering Noise in Land-Use Planning and Control. These land use compatibility guidelines have been included for reference purposes (see **Table B-1**).

**Table B-1. Land Use Compatibility Guidelines**

| SLUCM No. | Land Use Name | Accident Potential Zones | | | Noise Zones in DNL dB | | | |
|---|---|---|---|---|---|---|---|---|
| | | Clear Zone | APZ I | APZ II | 65-69 | 70-74 | 75-79 | 80+ |
| | | (Refer to the key at the end of this table for a definition of the table entries below.) | | | | | | |
| **10** | **Residential** | | | | | | | |
| **11** | **Household units** | | | | | | | |
| 11.11 | Single units; detached | N | N | Y1 | A11 | B11 | N | N |
| 11.12 | Single units; semidetached | N | N | N | A11 | B11 | N | N |
| 11.13 | Single units; attached row | N | N | N | A11 | B11 | N | N |
| 11.21 | Two units; side-by-side | N | N | N | A11 | B11 | N | N |
| 11.22 | Two units; one above the other | N | N | N | A11 | B11 | N | N |
| 11.31 | Apartments; walk up | N | N | N | A11 | B11 | N | N |
| 11.32 | Apartments; elevator | N | N | N | A11 | B11 | N | N |
| 12 | Group quarters | N | N | N | A11 | B11 | N | N |
| 13 | Residential hotels | N | N | N | A11 | B11 | N | N |
| 14 | Mobile home parks or courts | N | N | N | N | N | N | N |
| 15 | Transient lodgings | N | N | N | A11 | B11 | C11 | N |
| 16 | Other residential | N | N | N1 | A11 | B11 | N | N |
| **20** | **Manufacturing** | | | | | | | |
| 21 | Food & kindred products; manufacturing | N | N2 | Y | Y | Y12 | Y13 | Y14 |
| 22 | Textile mill products; manufacturing | N | N2 | Y | Y | Y12 | Y13 | Y14 |
| 23 | Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing | N | N | N2 | Y | Y12 | Y13 | Y14 |
| 24 | Lumber and wood products (except furniture); manufacturing | N | Y2 | Y | Y | Y12 | Y13 | Y14 |
| 25 | Furniture and fixtures; manufacturing | N | Y2 | Y | Y | Y12 | Y13 | Y14 |
| 26 | Paper & allied products; manufacturing | N | Y2 | Y | Y | Y12 | Y13 | Y14 |
| 27 | Printing, publishing, and allied industries | N | Y2 | Y | Y | Y12 | Y13 | Y14 |

| SLUCM No. | Land Use Name | Accident Potential Zones | | | Noise Zones in DNL dB | | | |
|---|---|---|---|---|---|---|---|---|
| | | Clear Zone | APZ I | APZ II | 65-69 | 70-74 | 75-79 | 80+ |
| 28 | Chemicals and allied products; manufacturing | N | N | N2 | Y | Y12 | Y13 | Y14 |
| 29 | Petroleum refining and related industries | N | N | Y | Y | Y12 | Y13 | Y14 |
| **30** | **Manufacturing** | | | | | | | |
| 31 | Rubber and misc. plastic products, manufacturing | N | N2 | N2 | Y | Y12 | Y13 | Y14 |
| 32 | Stone, clay and glass products manufacturing | N | N2 | Y | Y | Y12 | Y13 | Y14 |
| 33 | Primary metal industries | N | N2 | Y | Y | Y12 | Y13 | Y14 |
| 34 | Fabricated metal products; manufacturing | N | N2 | Y | Y | Y12 | Y13 | Y14 |
| 35 | Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing | N | N | N2 | Y | A | B | N |
| 39 | Miscellaneous manufacturing | N | Y2 | Y2 | Y | Y12 | Y13 | Y14 |
| **40** | **Transportation, Communications and Utilities** | | | | | | | |
| 41 | Railroad, rapid rail transit and street railroad transportation | N3 | Y4 | Y | Y | Y12 | Y13 | Y14 |
| 42 | Motor vehicle transportation | N3 | Y | Y | Y | Y12 | Y13 | Y14 |
| 43 | Aircraft transportation | N3 | Y4 | Y | Y | Y12 | Y13 | Y14 |
| 44 | Marine craft transportation | N3 | Y4 | Y | Y | Y12 | Y13 | Y14 |
| 45 | Highway & street right-of-way | N3 | Y | Y | Y | Y12 | Y13 | Y14 |
| 46 | Automobile parking | N3 | Y4 | Y | Y | Y12 | Y13 | Y14 |
| 47 | Communications | N3 | Y4 | Y | Y | A15 | B15 | N |
| 48 | Utilities | N3 | Y4 | Y | Y | Y | Y12 | Y13 |
| 49 | Other transportation communications and utilities | N3 | Y4 | Y | Y | A15 | B15 | N |
| **50** | **Trade** | | | | | | | |
| 51 | Wholesale trade | N | Y2 | Y | Y | Y12 | Y13 | Y14 |
| 52 | Retail trade-building materials, hardware and farm equipment | N | Y2 | Y | Y | Y12 | Y13 | Y14 |
| 53 | Retail trade-general merchandise | N | N2 | Y2 | Y | A | B | N |
| 54 | Retail trade-food | N | N2 | Y2 | Y | A | B | N |

| SLUCM No. | Land Use | Accident Potential Zones | | | Noise Zones in DNL dB | | | |
|---|---|---|---|---|---|---|---|---|
| | Name | Clear Zone | APZ I | APZ II | 65-69 | 70-74 | 75-79 | 80+ |
| 55 | Retail trade-automotive, marine craft, aircraft and accessories | N | Y2 | Y2 | Y | A | B | N |
| 56 | Retail trade-apparel and accessories | N | N2 | Y2 | Y | A | B | N |
| 57 | Retail trade-furniture, home furnishings and equipment | N | N2 | Y2 | Y | A | B | N |
| 58 | Retail trade-eating and drinking establishments | N | N | N2 | Y | A | B | N |
| 59 | Other retail trade | N | N2 | Y2 | Y | A | B | N |
| **60** | **Services** | | | | | | | |
| 61 | Finance, insurance and real estate services | N | N | Y6 | Y | A | B | N |
| 62 | Personal services | N | N | Y6 | Y | A | B | N |
| 62.4 | Cemeteries | N | Y7 | Y7 | Y | Y12 | Y13 | Y14,21 |
| 63 | Business services | N | Y8 | Y8 | Y | A | B | N |
| 64 | Repair services | N | Y2 | Y | Y | Y12 | Y13 | Y14 |
| 65 | Professional services | N | N | Y6 | Y | A | B | N |
| 65.1 | Hospitals, nursing homes | N | N | N | A* | B* | N | N |
| 65.1 | Other medical facilities | N | N | N | Y | A | B | N |
| 66 | Contract construction services | N | Y6 | Y | Y | A | B | N |
| 67 | Governmental services | N | N | Y6 | Y* | A* | B* | N |
| 68 | Educational services | N | N | N | A* | B* | N | N |
| 69 | Miscellaneous services | N | N2 | Y2 | Y | A | B | N |
| **70** | **Cultural, Entertainment and Recreational** | | | | | | | |
| 71 | Cultural activities (including churches) | N | N | N2 | A* | B* | N | N |
| 71.2 | Nature exhibits | N | Y2 | Y | Y* | N | N | N |
| 72 | Public assembly | N | N | N | Y | N | N | N |
| 72.1 | Auditoriums, concert halls | N | N | N | A | B | N | N |
| 72.11 | Outdoor music shell, amphitheaters | N | N | N | N | N | N | N |
| 72.2 | Outdoor sports arenas, spectator sports | N | N | N | Y17 | Y17 | N | N |
| 73 | Amusements | N | N | Y8 | Y | Y | N | N |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | N | Y8,9,10 | Y | Y* | A* | B* | N |

| SLUCM No. | Land Use Name | Accident Potential Zones | | | Noise Zones in DNL dB | | | |
|---|---|---|---|---|---|---|---|---|
| | | Clear Zone | APZ I | APZ II | 65-69 | 70-74 | 75-79 | 80+ |
| 75 | Resorts and group camps | N | N | N | Y* | Y* | N | N |
| 76 | Parks | N | Y8 | Y8 | Y* | Y* | N | N |
| 79 | Other cultural, entertainment and recreation | N | Y9 | Y9 | Y* | Y* | N | N |
| **80** | **Resources Production and Extraction** | | | | | | | |
| 81 | Agriculture (except livestock) | Y16 | Y | Y | Y18 | Y19 | Y20 | Y20,21 |
| 81.5 to 81.7 | Livestock farming and animal breeding | N | Y | Y | Y18 | Y19 | Y20 | Y20,21 |
| 82 | Agricultural related activities | N | Y5 | Y | Y18 | Y19 | N | N |
| 83 | Forestry activities and related services | N5 | Y | Y | Y18 | Y19 | Y20 | Y20,21 |
| 84 | Fishing activities and related services | N5 | Y5 | Y | Y | Y | Y | Y |
| 85 | Mining activities and related services | N | Y5 | Y | Y | Y | Y | Y |
| 89 | Other resources production and extraction | N | Y5 | Y | Y | Y | Y | Y |

## LEGEND

SLUCM - Standard Land Use Coding Manual, U.S. Department of Transportation.

Y - (Yes) - Land use and related structures are compatible without restriction.

N - (No) - Land use and related structures are not compatible and should be prohibited.

$Y^x$ - (yes with restrictions) - Land use and related structures generally compatible; see notes 1 through 21.

$N^x$ - (no with exceptions) - See notes 1 through 21.

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C - Land use and related structures generally compatible; measures to achieve NLR of A (DNL 25 dB), B (DNL 30 dB), or C (DNL 35 dB) need to be incorporated into the design and construction of structures.

$A^*$, $B^*$, and $C^*$ - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

* - The designation of these uses as “compatible” in this zone reflects individual Federal agency and program consideration of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES

1. Suggested maximum density of one to two dwelling units per acre possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.

2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible in any accident potential zone (CZ, APZ I, or APZ II).

3. The placing of structures, buildings, or aboveground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7063 and UFC 3-260-01 for specific guidance.

4. No passenger terminals and no major aboveground transmission lines in APZ I.

5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.

6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.

7. Excludes chapels.

8. Facilities must be low intensity.

9. Clubhouse not recommended.

10. Areas for gatherings of people are not recommended.

11A. Although local conditions may require residential use, it is discouraged in DNL 65 to 69 dB and strongly discouraged in DNL 70 to 74 dB. An evaluation should be conducted prior to approvals, indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones, and there are no viable alternative locations.

11B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for DNL 65 to 69 dB and DNL 70 to 74 dB should be incorporated into building codes and considered in individual approvals.

11C. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve the same NLR as required for facilities in the DNL 65 to 69 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

13. Measures to achieve the same NLR as required for facilities in the DNL 70 to 74 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

14. Measures to achieve the same NLR as required for facilities in the DNL 75 to 79 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

15. If noise sensitive, use indicated NLR; if not, the use is compatible.

16. No buildings.

17. Land use is compatible provided special sound reinforcement systems are installed.

18. Residential buildings require the same NLR required for facilities in the DNL 65 to 69 dB range.

19. Residential buildings require the same NLR required for facilities in the DNL 70 to 74 dB range.

20. Residential buildings are not permitted.

21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

*This page intentionally left blank.*

# C

# Air Quality ACAM Report and RONA

# AIR CONFORMITY APPLICABILITY MODEL REPORT
# RECORD OF AIR ANALYSIS

**1. General Information:** The U.S. Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, *Air Quality Compliance And Resource Management*; the Environmental Impact Analysis Process (EIAP, 32 CFR § 989); and the General Conformity Rule (GCR, 40 CFR § 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**
**Base:** CANNON AFB
**County(s):** Curry, New Mexico
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Cannon Realignment and Beddown

**c. Project Number/s (if applicable):** Increased operations and infrastructure construction

**d. Projected Action Start Date:** 12/2019

**e. Action Description:** See Chapter 2 of the Environmental Assessment

**2. Air Impact Analysis:** Based on the attainment status at the action location, the requirements of the General Conformity Rule are not applicable. Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts on air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (*de minimis* levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts on air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an action's emissions within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR *de minimis* threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR § 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

**Construction Emissions**

| Pollutant | Action Emissions (ton/yr) | Air Quality Indicator | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| NOT IN A REGULATORY AREA | | | |
| **VOC** | 1.782 | 100 | No |
| **$NO_x$** | 7.643 | 100 | No |
| **CO** | 7.342 | 100 | No |
| **$SO_x$** | 0.017 | 100 | No |
| **PM 10** | 3.326 | 100 | No |
| **PM 2.5** | 0.365 | 100 | No |
| **Pb** | 0.000 | 25 | No |
| **$NH_3$** | 0.004 | 100 | No |
| **$CO_2e$** | 1,595.2 | | |

## Operational Emissions

| Pollutant | Action Emissions (ton/yr) | Air Quality Indicator | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| NOT IN A REGULATORY AREA | | | |
| **VOC** | 25.610 | 100 | No |
| **$NO_x$** | 39.509 | 100 | No |
| **CO** | 46.922 | 100 | No |
| **$SO_x$** | 3.038 | 100 | No |
| **PM 10** | 2.467 | 100 | No |
| **PM 2.5** | 2.226 | 100 | No |
| **Pb** | 0.000 | 25 | No |
| **$NH_3$** | 0.034 | 100 | No |
| **$CO_2e$** | 9,214.2 | | |

None of the estimated emissions associated with this action are above the GCR indicators, indicating no significant impact on air quality; therefore, no further air assessment is needed.

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

## 1. General Information

**- Action Location**
**Base:** CANNON AFB
**State:** New Mexico
**County(s):** Curry
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**- Action Title:** Canon Beddown

**- Project Number/s (if applicable):** Increased operations, construction and demolition

**- Projected Action Start Date:** 1 / 2019

**- Action Purpose and Need:**
Canon Beddown

**- Action Description:**
-

**- Point of Contact**
**Name:** -
**Title:** -
**Organization:** -
**Email:** -
**Phone Number:** -

**- Activity List:**

| Activity Type | | Activity Title |
|---|---|---|
| 2. | Construction / Demolition | Construction and Demolition |
| 3. | Personnel | Additional Personnel |
| 4. | Heating | Heating |
| 5. | Aircraft | 16 SOS Upgrade of the AC-130W to AC-130J |
| 6. | Aircraft | 27 SOS Water Safety Training |
| 7. | Aircraft | 12 SOS MQ-9 Reaper Remotely Piloted Aircraft Personnel Realignment |
| 8. | Aircraft | 9SOS |

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

## 2. Construction / Demolition

### 2.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Curry; Curry
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**- Activity Title:** Construction and Demolition

**- Activity Description:**
Construction and Demolition

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**- Activity Start Date**
**Start Month:** 1
**Start Month:** 2019

**- Activity End Date**
**Indefinite:** False
**End Month:** 12
**End Month:** 2019

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 1.781986 |
| $SO_x$ | 0.016510 |
| $NO_x$ | 7.643257 |
| CO | 7.341787 |
| PM 10 | 3.325800 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 2.5 | 0.364685 |
| Pb | 0.000000 |
| $NH_3$ | 0.004019 |
| $CO_2e$ | 1595.2 |
| | |

## 2.1 Demolition Phase

### 2.1.1 Demolition Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2019

**- Phase Duration**
**Number of Month:** 12
**Number of Days:** 0

### 2.1.2 Demolition Phase Assumptions

**- General Demolition Information**
**Area of Building to be demolished ($ft^2$):** 18400
**Height of Building to be demolished (ft):** 12.67

**- Default Settings Used:** Yes

**- Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Concrete/Industrial Saws Composite | 1 | 8 |
| Excavators Composite | 3 | 8 |
| Rubber Tired Dozers Composite | 1 | 1 |
| Tractors/Loaders/Backhoes Composite | 2 | 6 |

**- Vehicle Exhaust**
**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.1.3 Demolition Phase Emission Factor(s)

**- Construction Exhaust Emission Factors (lb/hour) (default)**

| **Concrete/Industrial Saws Composite** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0535 | 0.0006 | 0.3668 | 0.3811 | 0.0225 | 0.0225 | 0.0048 | 58.584 |
| **Excavators Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0786 | 0.0013 | 0.4574 | 0.5139 | 0.0214 | 0.0214 | 0.0070 | 119.75 |
| **Rubber Tired Dozers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2226 | 0.0024 | 1.6948 | 0.8387 | 0.0682 | 0.0682 | 0.0200 | 239.58 |
| **Tractors/Loaders/Backhoes Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0471 | 0.0007 | 0.3018 | 0.3630 | 0.0159 | 0.0159 | 0.0042 | 66.904 |

**- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.340 | 000.002 | 000.276 | 003.604 | 000.008 | 000.007 | | 000.024 | 00328.206 |
| LDGT | 000.416 | 000.003 | 000.480 | 005.057 | 000.010 | 000.009 | | 000.025 | 00423.247 |
| HDGV | 000.764 | 000.005 | 001.218 | 016.264 | 000.023 | 000.020 | | 000.044 | 00760.998 |
| LDDV | 000.119 | 000.003 | 000.146 | 002.473 | 000.004 | 000.004 | | 000.008 | 00318.976 |
| LDDT | 000.281 | 000.004 | 000.446 | 004.521 | 000.007 | 000.006 | | 000.008 | 00458.185 |
| HDDV | 000.618 | 000.013 | 006.194 | 002.048 | 000.195 | 000.179 | | 000.030 | 01519.413 |
| MC | 002.745 | 000.003 | 000.847 | 013.480 | 000.027 | 000.024 | | 000.054 | 00396.763 |

### 2.1.4 Demolition Phase Formula(s)

**- Fugitive Dust Emissions per Phase**

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor ($lb/ft^3$)
BA: Area of Building to be demolished ($ft^2$)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
$EF_{POL}$: Emission Factor for Pollutant (lb/hour)

2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish ($ft^2$)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**

$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.2 Site Grading Phase

### 2.2.1 Site Grading Phase Timeline Assumptions

**- Phase Start Date**

**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2019

**- Phase Duration**

**Number of Month:** 3
**Number of Days:** 0

### 2.2.2 Site Grading Phase Assumptions

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**- General Site Grading Information**

**Area of Site to be Graded ($ft^2$):** 96600
**Amount of Material to be Hauled On-Site ($yd^3$):** 0
**Amount of Material to be Hauled Off-Site ($yd^3$):** 0

**- Site Grading Default Settings**

**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Excavators Composite | 1 | 8 |
| Graders Composite | 1 | 6 |
| Other Construction Equipment Composite | 1 | 8 |
| Rubber Tired Dozers Composite | 1 | 6 |
| Scrapers Composite | 3 | 8 |
| Tractors/Loaders/Backhoes Composite | 1 | 7 |

**- Vehicle Exhaust**

**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.2.3 Site Grading Phase Emission Factor(s)

**- Construction Exhaust Emission Factors (lb/hour) (default)**

| **Excavators Composite** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0786 | 0.0013 | 0.4574 | 0.5139 | 0.0214 | 0.0214 | 0.0070 | 119.75 |
| **Graders Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0982 | 0.0014 | 0.6490 | 0.5786 | 0.0316 | 0.0316 | 0.0088 | 132.96 |
| **Other Construction Equipment Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0595 | 0.0012 | 0.3971 | 0.3522 | 0.0158 | 0.0158 | 0.0053 | 122.63 |
| **Rubber Tired Dozers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2226 | 0.0024 | 1.6948 | 0.8387 | 0.0682 | 0.0682 | 0.0200 | 239.58 |
| **Scrapers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2020 | 0.0026 | 1.4692 | 0.8161 | 0.0594 | 0.0594 | 0.0182 | 262.94 |
| **Tractors/Loaders/Backhoes Composite** | | | | | | | | |

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CH_4$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| Emission Factors | 0.0471 | 0.0007 | 0.3018 | 0.3630 | 0.0159 | 0.0159 | 0.0042 | 66.904 |

**- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.340 | 000.002 | 000.276 | 003.604 | 000.008 | 000.007 | | 000.024 | 00328.206 |
| LDGT | 000.416 | 000.003 | 000.480 | 005.057 | 000.010 | 000.009 | | 000.025 | 00423.247 |
| HDGV | 000.764 | 000.005 | 001.218 | 016.264 | 000.023 | 000.020 | | 000.044 | 00760.998 |
| LDDV | 000.119 | 000.003 | 000.146 | 002.473 | 000.004 | 000.004 | | 000.008 | 00318.976 |
| LDDT | 000.281 | 000.004 | 000.446 | 004.521 | 000.007 | 000.006 | | 000.008 | 00458.185 |
| HDDV | 000.618 | 000.013 | 006.194 | 002.048 | 000.195 | 000.179 | | 000.030 | 01519.413 |
| MC | 002.745 | 000.003 | 000.847 | 013.480 | 000.027 | 000.024 | | 000.054 | 00396.763 |

### 2.2.4 Site Grading Phase Formula(s)

**- Fugitive Dust Emissions per Phase**

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
$EF_{POL}$: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
$HA_{OnSite}$: Amount of Material to be Hauled On-Site ($yd^3$)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site ($yd^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**

$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.3 Trenching/Excavating Phase

### 2.3.1 Trenching / Excavating Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2019

**- Phase Duration**
**Number of Month:** 3
**Number of Days:** 0

### 2.3.2 Trenching / Excavating Phase Assumptions

**- General Trenching/Excavating Information**
**Area of Site to be Trenched/Excavated ($ft^2$):** 966
**Amount of Material to be Hauled On-Site ($yd^3$):** 0
**Amount of Material to be Hauled Off-Site ($yd^3$):** 0

**- Trenching Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Excavators Composite | 2 | 8 |
| Other General Industrial Equipmen Composite | 1 | 8 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**
**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.3.3 Trenching / Excavating Phase Emission Factor(s)

**- Construction Exhaust Emission Factors (lb/hour) (default)**

| **Excavators Composite** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0786 | 0.0013 | 0.4574 | 0.5139 | 0.0214 | 0.0214 | 0.0070 | 119.75 |
| **Graders Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0982 | 0.0014 | 0.6490 | 0.5786 | 0.0316 | 0.0316 | 0.0088 | 132.96 |
| **Other Construction Equipment Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0595 | 0.0012 | 0.3971 | 0.3522 | 0.0158 | 0.0158 | 0.0053 | 122.63 |
| **Rubber Tired Dozers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2226 | 0.0024 | 1.6948 | 0.8387 | 0.0682 | 0.0682 | 0.0200 | 239.58 |
| **Scrapers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2020 | 0.0026 | 1.4692 | 0.8161 | 0.0594 | 0.0594 | 0.0182 | 262.94 |
| **Tractors/Loaders/Backhoes Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0471 | 0.0007 | 0.3018 | 0.3630 | 0.0159 | 0.0159 | 0.0042 | 66.904 |

**- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.340 | 000.002 | 000.276 | 003.604 | 000.008 | 000.007 | | 000.024 | 00328.206 |
| LDGT | 000.416 | 000.003 | 000.480 | 005.057 | 000.010 | 000.009 | | 000.025 | 00423.247 |
| HDGV | 000.764 | 000.005 | 001.218 | 016.264 | 000.023 | 000.020 | | 000.044 | 00760.998 |
| LDDV | 000.119 | 000.003 | 000.146 | 002.473 | 000.004 | 000.004 | | 000.008 | 00318.976 |
| LDDT | 000.281 | 000.004 | 000.446 | 004.521 | 000.007 | 000.006 | | 000.008 | 00458.185 |
| HDDV | 000.618 | 000.013 | 006.194 | 002.048 | 000.195 | 000.179 | | 000.030 | 01519.413 |
| MC | 002.745 | 000.003 | 000.847 | 013.480 | 000.027 | 000.024 | | 000.054 | 00396.763 |

### 2.3.4 Trenching / Excavating Phase Formula(s)

**- Fugitive Dust Emissions per Phase**

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)

NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
$EF_{POL}$: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
$HA_{OnSite}$: Amount of Material to be Hauled On-Site ($yd^3$)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site ($yd^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**

$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.4 Building Construction Phase

### 2.4.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**

**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2019

**- Phase Duration**

**Number of Month:** 12
**Number of Days:** 0

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

### 2.4.2 Building Construction Phase Assumptions

**- General Building Construction Information**

**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 61300
**Height of Building (ft):** 12.67
**Number of Units:** N/A

**- Building Construction Default Settings**

**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cranes Composite | 1 | 6 |
| Forklifts Composite | 2 | 6 |
| Generator Sets Composite | 1 | 8 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |
| Welders Composite | 3 | 8 |

**- Vehicle Exhaust**

**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

**- Vendor Trips**

**Average Vendor Round Trip Commute (mile):** 40 (default)

**- Vendor Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

### 2.4.3 Building Construction Phase Emission Factor(s)

**- Construction Exhaust Emission Factors (lb/hour) (default)**

| **Cranes Composite** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CH_4$ | $CO_2e$ |
| Emission Factors | 0.0953 | 0.0013 | 0.7235 | 0.3981 | 0.0286 | 0.0286 | 0.0086 | 128.84 |
| **Forklifts Composite** | | | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CH_4$ | $CO_2e$ |
| Emission Factors | 0.0344 | 0.0006 | 0.1923 | 0.2166 | 0.0085 | 0.0085 | 0.0031 | 54.473 |
| **Generator Sets Composite** | | | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CH_4$ | $CO_2e$ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Emission Factors | 0.0430 | 0.0006 | 0.3483 | 0.2755 | 0.0168 | 0.0168 | 0.0038 | 61.089 |
| **Tractors/Loaders/Backhoes Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0471 | 0.0007 | 0.3018 | 0.3630 | 0.0159 | 0.0159 | 0.0042 | 66.904 |
| **Welders Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0343 | 0.0003 | 0.1832 | 0.1842 | 0.0116 | 0.0116 | 0.0031 | 25.680 |

**- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.340 | 000.002 | 000.276 | 003.604 | 000.008 | 000.007 | | 000.024 | 00328.206 |
| LDGT | 000.416 | 000.003 | 000.480 | 005.057 | 000.010 | 000.009 | | 000.025 | 00423.247 |
| HDGV | 000.764 | 000.005 | 001.218 | 016.264 | 000.023 | 000.020 | | 000.044 | 00760.998 |
| LDDV | 000.119 | 000.003 | 000.146 | 002.473 | 000.004 | 000.004 | | 000.008 | 00318.976 |
| LDDT | 000.281 | 000.004 | 000.446 | 004.521 | 000.007 | 000.006 | | 000.008 | 00458.185 |
| HDDV | 000.618 | 000.013 | 006.194 | 002.048 | 000.195 | 000.179 | | 000.030 | 01519.413 |
| MC | 002.745 | 000.003 | 000.847 | 013.480 | 000.027 | 000.024 | | 000.054 | 00396.763 |

### 2.4.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
$EF_{POL}$: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building ($ft^2$)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor $ft^3$ to trips (0.42 trip / 1000 $ft^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**

$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works

NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

$VMT_{VT}$: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building ($ft^2$)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor $ft^3$ to trips (0.38 trip / 1000 $ft^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VT}$: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.5 Architectural Coatings Phase

### 2.5.1 Architectural Coatings Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2019

**- Phase Duration**
**Number of Month:** 3
**Number of Days:** 0

### 2.5.2 Architectural Coatings Phase Assumptions

**- General Architectural Coatings Information**
**Building Category:** Non-Residential
**Total Square Footage ($ft^2$):** 48300
**Number of Units:** N/A

**- Architectural Coatings Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Worker Trips**
**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.5.3 Architectural Coatings Phase Emission Factor(s)

**- Worker Trips Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.340 | 000.002 | 000.276 | 003.604 | 000.008 | 000.007 | | 000.024 | 00328.206 |
| LDGT | 000.416 | 000.003 | 000.480 | 005.057 | 000.010 | 000.009 | | 000.025 | 00423.247 |
| HDGV | 000.764 | 000.005 | 001.218 | 016.264 | 000.023 | 000.020 | | 000.044 | 00760.998 |
| LDDV | 000.119 | 000.003 | 000.146 | 002.473 | 000.004 | 000.004 | | 000.008 | 00318.976 |
| LDDT | 000.281 | 000.004 | 000.446 | 004.521 | 000.007 | 000.006 | | 000.008 | 00458.185 |
| HDDV | 000.618 | 000.013 | 006.194 | 002.048 | 000.195 | 000.179 | | 000.030 | 01519.413 |
| MC | 002.745 | 000.003 | 000.847 | 013.480 | 000.027 | 000.024 | | 000.054 | 00396.763 |

### 2.5.4 Architectural Coatings Phase Formula(s)

**- Worker Trips Emissions per Phase**

$VMT_{WT} = (1 * WT * PA) / 800$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips ( 1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area ($ft^2$)
800: Conversion Factor square feet to man days ( 1 $ft^2$ / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Off-Gassing Emissions per Phase**

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

$VOC_{AC}$: Architectural Coating VOC Emissions (TONs)
BA: Area of Building ($ft^2$)
2.0: Conversion Factor total area to coated area (2.0 $ft^2$ coated area / total area)
0.0116: Emission Factor ($lb/ft^2$)
2000: Conversion Factor pounds to tons

## 2.6 Paving Phase

### 2.6.1 Paving Phase Timeline Assumptions

**- Phase Start Date**

**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2019

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**- Phase Duration**
**Number of Month:** 3
**Number of Days:** 0

## 2.6.2 Paving Phase Assumptions

**- General Paving Information**
**Paving Area ($ft^2$):** 48300

**- Paving Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cement and Mortar Mixers Composite | 4 | 6 |
| Pavers Composite | 1 | 7 |
| Paving Equipment Composite | 1 | 8 |
| Rollers Composite | 1 | 7 |
| Tractors/Loaders/Backhoes Composite | 1 | 7 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**
**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

## 2.6.3 Paving Phase Emission Factor(s)

**- Construction Exhaust Emission Factors (lb/hour) (default)**

| **Excavators Composite** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0786 | 0.0013 | 0.4574 | 0.5139 | 0.0214 | 0.0214 | 0.0070 | 119.75 |
| **Graders Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0982 | 0.0014 | 0.6490 | 0.5786 | 0.0316 | 0.0316 | 0.0088 | 132.96 |
| **Other Construction Equipment Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.0595 | 0.0012 | 0.3971 | 0.3522 | 0.0158 | 0.0158 | 0.0053 | 122.63 |
| **Rubber Tired Dozers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2226 | 0.0024 | 1.6948 | 0.8387 | 0.0682 | 0.0682 | 0.0200 | 239.58 |
| **Scrapers Composite** | | | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$CH_4$** | **$CO_2e$** |
| Emission Factors | 0.2020 | 0.0026 | 1.4692 | 0.8161 | 0.0594 | 0.0594 | 0.0182 | 262.94 |

| Tractors/Loaders/Backhoes Composite | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CH_4$ | $CO_2e$ |
| Emission Factors | 0.0471 | 0.0007 | 0.3018 | 0.3630 | 0.0159 | 0.0159 | 0.0042 | 66.904 |

**- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.340 | 000.002 | 000.276 | 003.604 | 000.008 | 000.007 | | 000.024 | 00328.206 |
| LDGT | 000.416 | 000.003 | 000.480 | 005.057 | 000.010 | 000.009 | | 000.025 | 00423.247 |
| HDGV | 000.764 | 000.005 | 001.218 | 016.264 | 000.023 | 000.020 | | 000.044 | 00760.998 |
| LDDV | 000.119 | 000.003 | 000.146 | 002.473 | 000.004 | 000.004 | | 000.008 | 00318.976 |
| LDDT | 000.281 | 000.004 | 000.446 | 004.521 | 000.007 | 000.006 | | 000.008 | 00458.185 |
| HDDV | 000.618 | 000.013 | 006.194 | 002.048 | 000.195 | 000.179 | | 000.030 | 01519.413 |
| MC | 002.745 | 000.003 | 000.847 | 013.480 | 000.027 | 000.024 | | 000.054 | 00396.763 |

### 2.6.4 Paving Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
$EF_{POL}$: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area ($ft^2$)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**

$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Off-Gassing Emissions per Phase**
$VOC_P = (2.62 * PA) / 43560$

$VOC_P$: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area ($ft^2$)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)$^2$ / acre)

## 3. Personnel

### 3.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

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

**- Activity Title:** Additional Personnel

**- Activity Description:**
242 additional personnel

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2020

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

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.546778 |
| $SO_x$ | 0.003644 |
| $NO_x$ | 0.497748 |
| CO | 6.078953 |
| PM 10 | 0.011911 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.010445 |
| Pb | 0.000000 |
| $NH_3$ | 0.033542 |
| $CO_2e$ | 522.1 |
| | |

### 3.2 Personnel Assumptions

**- Number of Personnel**
**Active Duty Personnel:** 121

**Civilian Personnel:** 121
**Support Contractor Personnel:** 0
**Air National Guard (ANG) Personnel:** 0
**Reserve Personnel:** 0

**- Default Settings Used:** Yes

**- Average Personnel Round Trip Commute (mile):** 20 (default)

**- Personnel Work Schedule**
**Active Duty Personnel:** 5 Days Per Week (default)
**Civilian Personnel:** 5 Days Per Week (default)
**Support Contractor Personnel:** 5 Days Per Week (default)
**Air National Guard (ANG) Personnel:** 4 Days Per Week (default)
**Reserve Personnel:** 4 Days Per Month (default)

### 3.3 Personnel On Road Vehicle Mixture

**- On Road Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 37.55 | 60.32 | 0 | 0.03 | 0.2 | 0 | 1.9 |
| GOVs | 54.49 | 37.73 | 4.67 | 0 | 0 | 3.11 | 0 |

### 3.4 Personnel Emission Factor(s)

**- On Road Vehicle Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|---|
| LDGV | 000.309 | 000.002 | 000.239 | 003.421 | 000.007 | 000.006 | | 000.023 | 00318.896 |
| LDGT | 000.374 | 000.003 | 000.418 | 004.700 | 000.009 | 000.008 | | 000.024 | 00411.188 |
| HDGV | 000.696 | 000.005 | 001.076 | 015.187 | 000.021 | 000.019 | | 000.044 | 00758.535 |
| LDDV | 000.115 | 000.003 | 000.139 | 002.492 | 000.004 | 000.004 | | 000.008 | 00309.094 |
| LDDT | 000.250 | 000.004 | 000.394 | 004.238 | 000.007 | 000.006 | | 000.008 | 00438.938 |
| HDDV | 000.572 | 000.013 | 005.669 | 001.917 | 000.170 | 000.156 | | 000.030 | 01506.304 |
| MC | 002.734 | 000.003 | 000.845 | 013.302 | 000.027 | 000.023 | | 000.055 | 00396.858 |

### 3.5 Personnel Formula(s)

**- Personnel Vehicle Miles Travel for Work Days per Year**
$VMT_P = NP * WD * AC$

$VMT_P$: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

**- Total Vehicle Miles Travel per Year**
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

$VMT_{Total}$: Total Vehicle Miles Travel (miles)
$VMT_{AD}$: Active Duty Personnel Vehicle Miles Travel (miles)
$VMT_C$: Civilian Personnel Vehicle Miles Travel (miles)
$VMT_{SC}$: Support Contractor Personnel Vehicle Miles Travel (miles)
$VMT_{ANG}$: Air National Guard Personnel Vehicle Miles Travel (miles)
$VMT_{AFRC}$: Reserve Personnel Vehicle Miles Travel (miles)

**- Vehicle Emissions per Year**
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{Total}$: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 4. Heating

### 4.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

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

**- Activity Title:** Heating

**- Activity Description:**

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2020

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

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.009614 |
| $SO_x$ | 0.001049 |
| $NO_x$ | 0.174794 |
| CO | 0.146827 |
| PM 10 | 0.013284 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.013284 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 210.4 |
| | |

### 4.2 Heating Assumptions

**- Heating**
**Heating Calculation Type:** Heat Energy Requirement Method

**- Heat Energy Requirement Method**
**Area of floorspace to be heated ($ft^2$):** 54300
**Type of fuel:** Natural Gas
**Type of boiler/furnace:** Industrial (10 - 250 MMBtu/hr)
**Heat Value ($MMBtu/ft^3$):** 0.00105
**Energy Intensity ($MMBtu/ft^2$):** 0.0676

**- Default Settings Used:** Yes

**- Boiler/Furnace Usage**
**Operating Time Per Year (hours):** 900 (default)

### 4.3 Heating Emission Factor(s)

**- Heating Emission Factors (lb/1000000 scf)**

| VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| 5.5 | 0.6 | 100 | 84 | 7.6 | 7.6 | | | 120390 |

### 4.4 Heating Formula(s)

**- Heating Fuel Consumption $ft^3$ per Year**
$FC_{HER}$= HA * EI / HV / 1000000

$FC_{HER}$: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated ($ft^2$)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

**- Heating Emissions per Year**
$HE_{POL}$= FC * $EF_{POL}$ / 2000

$HE_{POL}$: Heating Emission Emissions (TONs)
FC: Fuel Consumption
$EF_{POL}$: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

## 5. Aircraft

### 5.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

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

**- Activity Title:** 16 SOS Upgrade of the AC-130W to AC-130J

**- Activity Description:**
16 SOS Upgrade of the AC-130W to AC-130J

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2020

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

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**End Year:** N/A

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 12.717432 |
| $SO_x$ | 1.548552 |
| $NO_x$ | 18.806397 |
| CO | 20.902644 |
| PM 10 | 1.124679 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 1.014415 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 4360.1 |
| | |

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

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 12.153682 |
| $SO_x$ | 1.318186 |
| $NO_x$ | 7.888035 |
| CO | 18.931610 |
| PM 10 | 0.920069 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.817725 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 4025.5 |
| | |

**- Activity Emissions [Aerospace Ground Equipment (AGE) part]:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.563749 |
| $SO_x$ | 0.230366 |
| $NO_x$ | 10.918362 |
| CO | 1.971034 |
| PM 10 | 0.204610 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.196690 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 334.6 |
| | |

## 5.2 Aircraft & Engines

### 5.2.1 Aircraft & Engines Assumptions

**- Aircraft & Engine**

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

**- Aircraft & Engine Surrogate**

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

### 5.2.2 Aircraft & Engines Emission Factor(s)

**- Aircraft & Engine Emissions Factors (lb/1000lb fuel)**

| | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| Idle | 794.00 | 24.15 | 1.06 | 3.90 | 32.00 | 0.83 | 0.75 | 3234 |
| Approach | 1185.00 | 14.26 | 1.06 | 4.40 | 22.20 | 0.97 | 0.87 | 3234 |
| Intermediate | 1825.00 | 0.58 | 1.06 | 9.20 | 2.40 | 0.51 | 0.46 | 3234 |
| Military | 2302.00 | 0.46 | 1.06 | 9.30 | 2.10 | 0.50 | 0.45 | 3234 |
| After Burn | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3234 |

## 5.3 Flight Operations

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

## 5.3.1 Flight Operations Assumptions

**- Flight Operations**

| | |
|---|---|
| **Number of Aircraft:** | 12 |
| **Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft:** | 257 |
| **Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft:** | 657 |
| **Number of Annual Trim Test(s) per Aircraft:** | 24 |

**- Default Settings Used:** Yes

**- Flight Operations TIMs (Time In Mode)**

| | |
|---|---|
| **Taxi/Idle Out [Idle] (mins):** | 9.2 (default) |
| **Takeoff [Military] (mins):** | 0.4 (default) |
| **Takeoff [After Burn] (mins):** | 0 (default) |
| **Climb Out [Intermediate] (mins):** | 1.2 (default) |
| **Approach [Approach] (mins):** | 5.1 (default) |
| **Taxi/Idle In [Idle] (mins):** | 6.7 (default) |

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

**- Trim Test**

| | |
|---|---|
| **Idle (mins):** | 12 (default) |
| **Approach (mins):** | 27 (default) |
| **Intermediate (mins):** | 9 (default) |
| **Military (mins):** | 12 (default) |
| **AfterBurn (mins):** | 0 (default) |

## 5.3.2 Flight Operations Formula(s)

**- Aircraft Emissions per Mode for LTOs per Year**

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for LTOs per Year**

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{LTO}$: Aircraft Emissions (TONs)
$AEM_{IDLE\_IN}$: Aircraft Emissions for Idle-In Mode (TONs)
$AEM_{IDLE\_OUT}$: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for TGOs per Year**

$AEM_{POL}$ = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for TGOs per Year**
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{TGO}$: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for Trim per Year**
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for Trim per Year**
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

$AE_{TRIM}$: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

## 5.4 Auxiliary Power Unit (APU)

### 5.4.1 Auxiliary Power Unit (APU) Assumptions

**- Default Settings Used:** Yes

**- Auxiliary Power Unit (APU) (default)**

| Number of APU per Aircraft | Operation Hours for Each LTO | Exempt Source? | Designation | Manufacturer |
|---|---|---|---|---|
| 1 | 1 | No | GTCP 85L | |

### 5.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

**- Auxiliary Power Unit (APU) Emission Factor (lb/hr)**

| Designation | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| GTCP 85L | 272.6 | 0.493 | 0.289 | 1.216 | 3.759 | 0.131 | 0.037 | 910.8 |

### 5.4.3 Auxiliary Power Unit (APU) Formula(s)

**- Auxiliary Power Unit (APU) Emissions per Year**
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

$APU_{POL}$: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
$EF_{POL}$: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

## 5.5 Aerospace Ground Equipment (AGE)

### 5.5.1 Aerospace Ground Equipment (AGE) Assumptions

**- Default Settings Used:** Yes

**- AGE Usage**
**Number of Annual LTO (Landing and Take-off) cycles for AGE:** 257

**- Aerospace Ground Equipment (AGE) (default)**

| Total Number of AGE | Operation Hours for Each LTO | Exempt Source? | AGE Type | Designation |
|---|---|---|---|---|
| 1 | 1 | No | Air Compressor | MC-1A - 18.4hp |
| 1 | 1 | No | Air Conditioner | MA-3D - 120hp |
| 1 | 11 | No | Generator Set | A/M32A-86D |
| 1 | 1 | No | Heater | H1 |
| 1 | 3 | No | Hydraulic Test Stand | MJ-2A |
| 1 | 10 | No | Light Cart | NF-2 |
| 1 | 0.25 | No | Start Cart | A/M32A-60A |

### 5.5.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

**- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)**

| Designation | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| MC-1A - 18.4hp | 1.1 | 0.267 | 0.008 | 0.419 | 0.267 | 0.071 | 0.068 | 24.8 |
| MA-3D - 120hp | 7.1 | 0.053 | 0.050 | 4.167 | 0.317 | 0.109 | 0.105 | 161.7 |
| A/M32A-86D | 6.5 | 0.294 | 0.046 | 6.102 | 0.457 | 0.091 | 0.089 | 147.0 |
| H1 | 0.4 | 0.100 | 0.011 | 0.160 | 0.180 | 0.006 | 0.006 | 8.9 |
| MJ-2A | 0.0 | 0.190 | 0.238 | 3.850 | 2.460 | 0.083 | 0.076 | 172.0 |
| NF-2 | 0.0 | 0.010 | 0.043 | 0.110 | 0.080 | 0.010 | 0.010 | 22.1 |
| A/M32A-60A | 0.0 | 0.270 | 0.306 | 1.820 | 5.480 | 0.211 | 0.205 | 221.1 |

### 5.5.3 Aerospace Ground Equipment (AGE) Formula(s)

**- Aerospace Ground Equipment (AGE) Emissions per Year**
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

$AGE_{POL}$: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
$EF_{POL}$: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

## 6. Aircraft

### 6.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

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

**- Activity Title:** 27 SOS Water Safety Training

**- Activity Description:**
27 SOS Water Safety Training

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2020

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

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.002384 |
| $SO_x$ | 0.092848 |
| $NO_x$ | 0.986086 |
| CO | 0.213253 |
| PM 10 | 0.138396 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.124381 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 283.3 |
| | |

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

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.002384 |
| $SO_x$ | 0.092848 |
| $NO_x$ | 0.986086 |
| CO | 0.213253 |
| PM 10 | 0.138396 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.124381 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 283.3 |
| | |

### 6.2 Aircraft & Engines

#### 6.2.1 Aircraft & Engines Assumptions

**- Aircraft & Engine**

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**Aircraft Designation:** CV-22A
**Engine Model:** T406-AD-400
**Primary Function:** Transport - Bomber
**Aircraft has After burn:** No
**Number of Engines:** 2

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

### 6.2.2 Aircraft & Engines Emission Factor(s)

**- Aircraft & Engine Emissions Factors (lb/1000lb fuel)**

| | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| Idle | 362.00 | 0.10 | 1.06 | 4.15 | 8.35 | 1.58 | 1.42 | 3234 |
| Approach | 663.00 | 0.02 | 1.06 | 6.05 | 3.47 | 1.58 | 1.42 | 3234 |
| Intermediate | 948.00 | 0.02 | 1.06 | 7.87 | 1.82 | 1.58 | 1.42 | 3234 |
| Military | 2507.00 | 0.01 | 1.06 | 18.03 | 0.29 | 1.58 | 1.42 | 3234 |
| After Burn | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3234 |

## 6.3 Flight Operations

### 6.3.1 Flight Operations Assumptions

**- Flight Operations**
**Number of Aircraft:** 3
**Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft:** 52
**Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft:** 52
**Number of Annual Trim Test(s) per Aircraft:** 24

**- Default Settings Used:** Yes

**- Flight Operations TIMs (Time In Mode)**
**Taxi/Idle Out [Idle] (mins):** 9.2 (default)
**Takeoff [Military] (mins):** 0.4 (default)
**Takeoff [After Burn] (mins):** 0 (default)
**Climb Out [Intermediate] (mins):** 1.2 (default)
**Approach [Approach] (mins):** 5.1 (default)
**Taxi/Idle In [Idle] (mins):** 6.7 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

**- Trim Test**
**Idle (mins):** 12 (default)
**Approach (mins):** 27 (default)
**Intermediate (mins):** 9 (default)
**Military (mins):** 12 (default)
**AfterBurn (mins):** 0 (default)

### 6.3.2 Flight Operations Formula(s)

**- Aircraft Emissions per Mode for LTOs per Year**

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$AEM_{POL}$ = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for LTOs per Year**
$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{LTO}$: Aircraft Emissions (TONs)
$AEM_{IDLE\_IN}$: Aircraft Emissions for Idle-In Mode (TONs)
$AEM_{IDLE\_OUT}$: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for TGOs per Year**
$AEM_{POL}$ = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for TGOs per Year**
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{TGO}$: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for Trim per Year**
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test

2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for Trim per Year**
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

$AE_{TRIM}$: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

### 6.4 Auxiliary Power Unit (APU)

### 6.4.1 Auxiliary Power Unit (APU) Assumptions

**- Default Settings Used:** Yes

**- Auxiliary Power Unit (APU) (default)**

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

### 6.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

**- Auxiliary Power Unit (APU) Emission Factor (lb/hr)**

| Designation | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|

### 6.4.3 Auxiliary Power Unit (APU) Formula(s)

**- Auxiliary Power Unit (APU) Emissions per Year**
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

$APU_{POL}$: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
$EF_{POL}$: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

## 7. Aircraft

### 7.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

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

**- Activity Title:** 12 SOS MQ-9 Reaper Remotely Piloted Aircraft Personnel Realignment

**- Activity Description:**
12 SOS MQ-9 Reaper Remotely Piloted Aircraft Personnel Realignment

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Note: Operaions cut in half to account for the selected aircraft duel engine configuration.
Assumes 1 hour per sortie.

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2020

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

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 1.308560 |
| $SO_x$ | 0.102450 |
| $NO_x$ | 0.965036 |
| CO | 1.148943 |
| PM 10 | 0.199450 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.179281 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 312.6 |
| | |

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

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 1.308560 |
| $SO_x$ | 0.102450 |
| $NO_x$ | 0.965036 |
| CO | 1.148943 |
| PM 10 | 0.199450 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.179281 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 312.6 |
| | |

## 7.2 Aircraft & Engines

### 7.2.1 Aircraft & Engines Assumptions

**- Aircraft & Engine**
**Aircraft Designation:** C-26B
**Engine Model:** TPE331-12UA-701G
**Primary Function:** General - Turboprop
**Aircraft has After burn:** No
**Number of Engines:** 2

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

### 7.2.2 Aircraft & Engines Emission Factor(s)

**- Aircraft & Engine Emissions Factors (lb/1000lb fuel)**

| | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| Idle | 112.00 | 90.97 | 1.06 | 2.86 | 61.52 | 2.68 | 2.41 | 3234 |
| Approach | 250.00 | 0.74 | 1.06 | 9.92 | 6.96 | 2.40 | 2.16 | 3234 |
| Intermediate | 409.00 | 0.17 | 1.06 | 11.86 | 0.98 | 1.47 | 1.32 | 3234 |
| Military | 458.00 | 0.13 | 1.06 | 12.36 | 0.76 | 1.75 | 1.57 | 3234 |
| After Burn | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3234 |

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

## 7.3 Flight Operations

### 7.3.1 Flight Operations Assumptions

**- Flight Operations**

| | |
|---|---|
| **Number of Aircraft:** | 12 |
| **Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft:** | 156 |
| **Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft:** | 0 |
| **Number of Annual Trim Test(s) per Aircraft:** | 24 |

**- Default Settings Used:** Yes

**- Flight Operations TIMs (Time In Mode)**

| | |
|---|---|
| **Taxi/Idle Out [Idle] (mins):** | 19 (default) |
| **Takeoff [Military] (mins):** | 0.5 (default) |
| **Takeoff [After Burn] (mins):** | 0 (default) |
| **Climb Out [Intermediate] (mins):** | 2.5 (default) |
| **Approach [Approach] (mins):** | 4.5 (default) |
| **Taxi/Idle In [Idle] (mins):** | 7 (default) |

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

**- Trim Test**

| | |
|---|---|
| **Idle (mins):** | 12 (default) |
| **Approach (mins):** | 27 (default) |
| **Intermediate (mins):** | 9 (default) |
| **Military (mins):** | 12 (default) |
| **AfterBurn (mins):** | 0 (default) |

### 7.3.2 Flight Operations Formula(s)

**- Aircraft Emissions per Mode for LTOs per Year**

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for LTOs per Year**

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{LTO}$: Aircraft Emissions (TONs)
$AEM_{IDLE\_IN}$: Aircraft Emissions for Idle-In Mode (TONs)
$AEM_{IDLE\_OUT}$: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for TGOs per Year**
$AEM_{POL}$ = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for TGOs per Year**
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{TGO}$: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for Trim per Year**
$AEPS_{POL}$ = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for Trim per Year**
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

$AE_{TRIM}$: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

## 7.4 Auxiliary Power Unit (APU)

### 7.4.1 Auxiliary Power Unit (APU) Assumptions

**- Default Settings Used:** Yes

**- Auxiliary Power Unit (APU) (default)**

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

### 7.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

**- Auxiliary Power Unit (APU) Emission Factor (lb/hr)**

| Designation | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|

### 7.4.3 Auxiliary Power Unit (APU) Formula(s)

**- Auxiliary Power Unit (APU) Emissions per Year**

$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

$APU_{POL}$: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
$EF_{POL}$: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

## 8. Aircraft

### 8.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

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

**- Activity Title:** 9SOS

**- Activity Description:**
9SOS increase in C-130J

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2020

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

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 11.025289 |
| $SO_x$ | 1.289956 |
| $NO_x$ | 18.078913 |
| CO | 18.431357 |
| PM 10 | 0.979145 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.883709 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 3525.7 |
| | |

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

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 10.391345 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.662528 |

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

| | |
|---|---|
| $SO_x$ | 1.030907 |
| $NO_x$ | 5.801066 |
| CO | 16.214902 |
| PM 10 | 0.749058 |

| | |
|---|---|
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 3149.5 |
| | |

**- Activity Emissions [Aerospace Ground Equipment (AGE) part]:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.633944 |
| $SO_x$ | 0.259050 |
| $NO_x$ | 12.277847 |
| CO | 2.216454 |
| PM 10 | 0.230086 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.221180 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |
| $CO_2e$ | 376.3 |
| | |

## 8.2 Aircraft & Engines

### 8.2.1 Aircraft & Engines Assumptions

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

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

### 8.2.2 Aircraft & Engines Emission Factor(s)

**- Aircraft & Engine Emissions Factors (lb/1000lb fuel)**

| | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| Idle | 794.00 | 24.15 | 1.06 | 3.90 | 32.00 | 0.83 | 0.75 | 3234 |
| Approach | 1185.00 | 14.26 | 1.06 | 4.40 | 22.20 | 0.97 | 0.87 | 3234 |
| Intermediate | 1825.00 | 0.58 | 1.06 | 9.20 | 2.40 | 0.51 | 0.46 | 3234 |
| Military | 2302.00 | 0.46 | 1.06 | 9.30 | 2.10 | 0.50 | 0.45 | 3234 |
| After Burn | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3234 |

## 8.3 Flight Operations

### 8.3.1 Flight Operations Assumptions

**- Flight Operations**
**Number of Aircraft:** 9
**Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft:** 289
**Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft:** 1361
**Number of Annual Trim Test(s) per Aircraft:** 12

**- Default Settings Used:** Yes

**- Flight Operations TIMs (Time In Mode)**
**Taxi/Idle Out [Idle] (mins):** 9.2 (default)
**Takeoff [Military] (mins):** 0.4 (default)

**Takeoff [After Burn] (mins):** 0 (default)
**Climb Out [Intermediate] (mins):** 1.2 (default)
**Approach [Approach] (mins):** 5.1 (default)
**Taxi/Idle In [Idle] (mins):** 6.7 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

**- Trim Test**

**Idle (mins):** 12 (default)
**Approach (mins):** 27 (default)
**Intermediate (mins):** 9 (default)
**Military (mins):** 12 (default)
**AfterBurn (mins):** 0 (default)

### 8.3.2 Flight Operations Formula(s)

**- Aircraft Emissions per Mode for LTOs per Year**

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for LTOs per Year**

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{LTO}$: Aircraft Emissions (TONs)
$AEM_{IDLE\_IN}$: Aircraft Emissions for Idle-In Mode (TONs)
$AEM_{IDLE\_OUT}$: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for TGOs per Year**

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

$AEM_{POL}$: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for TGOs per Year**

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

$AE_{TGO}$: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for Trim per Year**
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for Trim per Year**
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

$AE_{TRIM}$: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

## 8.4 Auxiliary Power Unit (APU)

### 8.4.1 Auxiliary Power Unit (APU) Assumptions

**- Default Settings Used:** Yes

**- Auxiliary Power Unit (APU) (default)**

| Number of APU per Aircraft | Operation Hours for Each LTO | Exempt Source? | Designation | Manufacturer |
|---|---|---|---|---|
| 1 | 1 | No | GTCP 85L | |

### 8.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

**- Auxiliary Power Unit (APU) Emission Factor (lb/hr)**

| Designation | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| GTCP 85L | 272.6 | 0.493 | 0.289 | 1.216 | 3.759 | 0.131 | 0.037 | 910.8 |

### 8.4.3 Auxiliary Power Unit (APU) Formula(s)

**- Auxiliary Power Unit (APU) Emissions per Year**
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

$APU_{POL}$: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units

OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
$EF_{POL}$: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

## 8.5 Aerospace Ground Equipment (AGE)

### 8.5.1 Aerospace Ground Equipment (AGE) Assumptions

**- Default Settings Used:** Yes

**- AGE Usage**
**Number of Annual LTO (Landing and Take-off) cycles for AGE:** 289

**- Aerospace Ground Equipment (AGE) (default)**

| Total Number of AGE | Operation Hours for Each LTO | Exempt Source? | AGE Type | Designation |
|---|---|---|---|---|
| 1 | 1 | No | Air Compressor | MC-1A - 18.4hp |
| 1 | 1 | No | Air Conditioner | MA-3D - 120hp |
| 1 | 11 | No | Generator Set | A/M32A-86D |
| 1 | 1 | No | Heater | H1 |
| 1 | 3 | No | Hydraulic Test Stand | MJ-2A |
| 1 | 10 | No | Light Cart | NF-2 |
| 1 | 0.25 | No | Start Cart | A/M32A-60A |

### 8.5.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

**- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)**

| Designation | Fuel Flow | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $CO_2e$ |
|---|---|---|---|---|---|---|---|---|
| MC-1A - 18.4hp | 1.1 | 0.267 | 0.008 | 0.419 | 0.267 | 0.071 | 0.068 | 24.8 |
| MA-3D - 120hp | 7.1 | 0.053 | 0.050 | 4.167 | 0.317 | 0.109 | 0.105 | 161.7 |
| A/M32A-86D | 6.5 | 0.294 | 0.046 | 6.102 | 0.457 | 0.091 | 0.089 | 147.0 |
| H1 | 0.4 | 0.100 | 0.011 | 0.160 | 0.180 | 0.006 | 0.006 | 8.9 |
| MJ-2A | 0.0 | 0.190 | 0.238 | 3.850 | 2.460 | 0.083 | 0.076 | 172.0 |
| NF-2 | 0.0 | 0.010 | 0.043 | 0.110 | 0.080 | 0.010 | 0.010 | 22.1 |
| A/M32A-60A | 0.0 | 0.270 | 0.306 | 1.820 | 5.480 | 0.211 | 0.205 | 221.1 |

### 8.5.3 Aerospace Ground Equipment (AGE) Formula(s)

**- Aerospace Ground Equipment (AGE) Emissions per Year**
$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

$AGE_{POL}$: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
$EF_{POL}$: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

# D

# Migratory Bird Species Lists

**Table D-1. Migratory Birds with Potential to Occur in Regional Airspace**

| Common Name | Scientific Name | Seasonal Occurrence |
|---|---|---|
| Bald Eagle | *Haliaeetus leucocephalus* | Wintering |
| Bendire's Thrasher | *Toxostoma bendirei* | Breeding |
| Black Throated Sparrow | *Amphispiza bilineata* | Breeding |
| Brewer's Sparrow | *Spizella breweri* | Migrating |
| Burrowing Owl | *Athene cunicularia* | Year-round |
| Cassin's Sparrow | *Aimophilia cassinii* | Breeding |
| Chestnut-collared Longspur | *Calcarius ornatus* | Wintering |
| Clark's Grebe | *Aechmophorus clarkii* | Migrating |
| Common Black-Hawk | *Buteogallus anthracinus* | Breeding |
| Golden Eagle | *Aquila chrysaetos* | Wintering |
| Grace's Warbler | *Dendroica graciae* | Breeding |
| Lark Bunting | *Calamospiza melanocorys* | Breeding |
| Lesser Yellowlegs | *Tringa flavipes* | Migrating |
| Lewis Woodpecker | *Melanerpes lewis* | Wintering |
| Long-billed Curlew | *Numenius americanus* | Breeding |
| Long-eared Owl | *Asio otus* | Wintering |
| Marbled Godwit | *Limosa fedoa* | Migrating |
| Mccown's Longspur | *Calcarius mccownii* | Wintering |
| Mountain Plover | *Charadrius montanus* | Breeding |
| Olive-sided Flycatcher | *Contopus cooperi* | Migrating |
| Pinyon Jay | *Gymnorhinus cyanocephalus* | Wintering |
| Rufous Hummingbird | *Selasphorus rufus* | Migrating |
| Semipalmated Sandpiper | *Calidris pusilla* | Migrating |
| Spague's Pipit | *Anthus spragueii* | Migrating |
| Veery | *Catharus fuscescens salicicola* | Migrating |
| Virginia's Warbler | *Vermivora virginiae* | Breeding |
| Whimbrel | *Numenius phaeopus* | Migrating |
| Willet | *Tringa semipalmata* | Migrating |
| Willow Flycatcher | *Empidonax traillii* | Breeding |

Sources: USFWS 2018d, Audubon 2018

**Table D-2. Migratory Birds with Potential to Occur at Ute Reservoir and/or Conchas Lake**

| Common Name | Scientific Name | Seasonal Occurrence |
|---|---|---|
| Bald Eagle*** | *Haliaeetus leucocephalus* | Wintering |
| Cassin's Sparrow* | *Aimophilia cassinii* | Breeding |
| Chestnut-collared Longspur*** | *Calcarius ornatus* | Wintering |
| Lark Bunting*** | *Calamospiza melanocorys* | Breeding |
| Long-billed Curlew*** | *Numenius americanus* | Breeding |
| Mountain Plover* | *Charadrius montanus* | Breeding |
| Semipalmated Sandpiper** | *Calidris pusilla* | Migrating |
| Sprague's Pipit** | *Anthus spragueii* | Migrating |

Sources: USFWS 2018e, USFWS 2018f, Audubon 2018

* = could occur at Ute Reservoir, ** = could occur at Conchas Lake *** = could occur at all locations

*This page intentionally left blank.*