Draft
Environmental Assessment
Airfield and Access Control Points Improvements
Holloman Air Force Base, New Mexico

October 2022

United States Air Force
49th Wing
Holloman Air Force Base, New Mexico

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Privacy Advisory

This Environmental Assessment (EA) is provided for public comment in accordance with the *National Environmental Policy Act* (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and 32 CFR Part 989, Environmental Impact Analysis Process (EIAP). The EIAP provides an opportunity for public input on Air Force decision-making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Public commenting allows the Air Force to make better informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment 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 Personal home addresses and phone numbers will not be published in the EA.

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COVER SHEET
DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR AIRFIELD AND ACCESS CONTROL POINTS IMPROVEMENTS, HOLLOMAN AIR FORCE BASE, NEW MEXICO

a. *Responsible Agency*: United States Air Force (Air Force)

b. *Cooperating Agency*: None

c. *Proposals and Actions*: This Environmental Assessment (EA) analyzes potential impacts associated with implementation of the Proposed Action and alternatives – to improve the airfield on Holloman Air Force Base (AFB) by expanding the number of end of the runway (EOR) arm/dearm pads from 23 to 48; increasing blast dissipation pavement; providing shelter for EOR crews; extending two taxiways; demolishing excess buildings; and repositioning the Main Gate and La Luz Gate (also known as the North Gate). The analysis considered the current (baseline) conditions of the affected environment and compared those to conditions that might occur should the Air Force implement the Proposed Action, any of the alternatives, or the No Action Alternative.

d. *For Additional Information*: Mr. Spencer Robison at 49 CES/CEIE, 550 Tabosa Avenue, Holloman AFB, New Mexico 88330 or by email at spencer.robison@us.af.mil.

e. *Designation*: Draft EA

f. *Abstract*: This EA was prepared pursuant to provisions of the National Environmental Policy Act, Title 42 United States Code §§ 4321 to 4347, implemented by the Council on Environmental Quality Regulations, Title 40, Code of Federal Regulations Parts 1500 to 1508, and 32 Code of Federal Regulations Part 989, Environmental Impact Analysis Process (EIAP). Potentially affected environmental resources were identified in coordination with local, state, and federal agencies.

The purpose of the Proposed Action and alternatives is to provide airfield and access control points and infrastructure that are adequate to meet the mission requirements of the 49th Wing and its tenant units. The proposed projects were identified as priorities for the installation for the improvement of the physical infrastructure and functionality of Holloman AFB, including current and future mission and facility requirements, development constraints and opportunities, and land use planning goals.

Alternative 1 would expand the number of end of the runway (EOR) arm/dearm pads from 23 to 48 to increase stage, arm and launch volume; increase blast dissipation pavement; provide shelter for EOR crews; and extend two taxiways to improve airfield geometry. Excess buildings located within and adjacent to the planned routes for the taxiway extensions would be demolished. These improvements would enhance airfield efficiency to alleviate safety, operational and training shortfalls, as well as allow for improved F-16 recovery and taxiway circulation and overall airfield efficiency.

Alternative 1 would also include repositioning the Main Gate and La Luz Gate and adding additional access control facilities. The changes would improve gate security, increase safety, and reduce traffic congestion. Base access points in their existing configuration do not meet current Anti-Terrorism/Force Protection standards and are not adequate for the volume of traffic entering Holloman AFB. The La Luz Gate is the only access to Holloman AFB from the north side of the base. Due to its distance from the main base cantonment area, the response time for Security Forces and other first responders is not adequate. Proposed improvements would increase and expand security infrastructure and decrease response time, increase the capacity for vehicles awaiting base access, expand the number of identification check lanes and the truck inspection capacity to facilitate entry, and improve overall visitor processing capacity. Under Alternative 2, the facilities at the current La Luz Gate would be renovated, and additional traffic lanes would be added. Under Alternative 3, the La Luz Gate would be closed, and the current facilities would be demolished. Under Alternatives 2 and 3, the airfield improvements and repositioning of the Main Gate under Alternative 1 would still take place.

The analysis of the affected environment and environmental consequences of implementing the Proposed Action and alternatives concluded that when standing environmental protection measures and best management practices are applied, there would be no significant impacts to noise, safety, air quality, biological resources, cultural resources, transportation, water resources, geological resources, and hazardous materials and wastes, contaminated sites, and toxic substances. No additional impacts would result from activities associated with the Proposed Action and alternatives when considered with reasonably foreseeable future actions at any of the locations.

PROPOSED FINDING OF NO SIGNIFICANT IMPACT (FONSI) AIRFIELD AND ACCESS CONTROL POINTS IMPROVEMENTS HOLLOMAN AIR FORCE BASE, NEW MEXICO

Pursuant to provisions of the National Environmental Policy Act, 42 United States Code §§ 4321 to 4370h; the Council on Environmental Quality Regulations, 40 Code of Federal Regulations (CFR) Parts 1500 to 1508; and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP) (1999), the United States Air Force (Air Force) prepared the attached Draft Environmental Assessment (EA) to address the potential environmental consequences associated with expanding the number of end of the runway (EOR) arm/dearm pads from 23 to 48; increasing blast dissipation pavement; providing shelter for EOR crews; extending two taxiways; demolishing excess buildings; and repositioning the Main Gate and La Luz Gate (also known as the North Gate) at Holloman Air Force Base (AFB), New Mexico.

Purpose and Need

The purpose of the Proposed Action is to enable Holloman AFB to support base- and Department of Defense (DOD)–wide efficiency by improving airfield efficiency and safety, access control points, and infrastructure.

Holloman AFB needs to provide airfield and access control points and infrastructure that are adequate to meet the mission requirements of the 49th Wing and its tenant units in a manner that:

- Meets all applicable DOD installation master planning criteria, consistent with Unified Facilities Criteria (UFC) 2-100-01, *Installation Master Planning;* UFC 3-260-01, *Airfield and Heliport Planning and Design*, Department of the Air Force Manual (DAFMAN) 32-1084, *Facility Requirements*; Air Force Instruction (AFI) 32-1015, *Integrated Installation Planning*; and Air Force Policy Directive 32-10, *Installations and Facilities;*
- Meets applicable DOD antiterrorism and force protection criteria, consistent with UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*, and the Air Force Installation Force Protection Guide;
- For access control points, meets the following: UFC 4-022-01, *Entry Control Facilities Access Control Points*; UFC 4-022-02, *Selection and Application of Vehicle Barriers*; Air Force Civil Engineer Center (AFCEC) document *Facilities Dynamic Prototypes Design: Installation Access Control Points (ECF/IACP);* and US Army Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) Pamphlet 55-15, *Traffic and Safety Engineering for Better Entry Control Facilities;*
- Supports and enhances the morale and welfare of personnel assigned to the installation, their families, and civilian staff, consistent with DOD Instruction 1015.10, *Military Morale, Welfare, and Recreation Programs*;
- Conforms to the Air Force and Major Command building design and construction guidance and the Holloman AFB Architectural Compatibility Guide to ensure a consistent and coherent architectural character throughout the base;
- Achieves the goals and objectives laid out in the Holloman AFB Installation Development Plan; and
- Is consistent with findings of the applicable Facility Sustainment, Restoration, and Modernization Planning Charrette Reports.

Proposed Action (Alternative 1)

The Proposed Action would expand the number of EOR arm/dearm pads from 23 to 48 to increase stage, arm and launch volume; increase blast dissipation pavement; provide shelter for EOR crews; and extend two taxiways to improve airfield geometry. Excess buildings located within and adjacent to the planned routes for the taxiway extensions would be demolished. These improvements would enhance airfield efficiency to alleviate safety, operational and training shortfalls, as well as allow for improved F-16 recovery and taxiway circulation and overall airfield efficiency.

The Proposed Action would also include repositioning the Main Gate and La Luz Gate and adding additional access control facilities. The changes would improve gate security, increase safety, and reduce traffic congestion. Base access points in their existing configuration do not meet current Anti-Terrorism/Force Protection (AT/FP) standards and are not adequate for the volume of traffic entering Holloman AFB. The La Luz Gate is the only access to Holloman AFB from the north side of the base. Due to its distance from the main base cantonment area, the response time for Security Forces and other first responders is not adequate. Proposed improvements would increase and expand security infrastructure and decrease response time, increase the capacity for vehicles awaiting base access, expand the number of identification check lanes and the truck inspection capacity to facilitate entry, and improve overall visitor processing capacity. Upon completion of the Main Gate and La Luz Gate relocation, the existing facilities would be demolished.

Alternative 2

Alternative 2 would renovate the current La Luz Gate facilities, reroute and add additional identification check lanes, and add additional security infrastructure (i.e., overwatch tower or pad). The airfield improvements and Main Gate repositioning actions under Alternative 1 would still occur.

Alternative 3

Under Alternative 3, the La Luz Gate would be permanently closed, and the current facilities would be demolished. A gate that could be used for emergency access or other uses that do not require entry control facilities would be added on La Luz Gate Road to close the installation boundary fence. The airfield improvements and Main Gate repositioning actions under Alternative 1 would still occur.

No Action Alternative

Under the No Action Alternative, the airfield improvements would not occur, and the Main Gate and La Luz Gates would remain in their current configuration. Under the No Action Alternative, the airfield inefficiencies and operational and training shortfalls would remain. Additionally, the security and safety concerns associated with the current configuration of the gates would not be resolved.

Summary of Findings

The Air Force has concluded that implementation of the Proposed Action and alternatives would result in no significant adverse impacts to the following resources: noise, safety, air quality, biological resources, cultural resources, transportation, water resources, geological resources, and hazardous materials and wastes, contaminated sites, and toxic substances. No significant impacts would result from activities associated with the Proposed Action and alternatives when considered with past, present, or reasonably foreseeable future actions at any of the locations included as part of the Proposed Action and alternatives. The Air Force would adhere to all established environmental protection measures, best management practices (BMPs), regulations, plans, and programs in the execution of the Proposed Action or alternatives.

Potentially affected environmental resources were identified through communications with state and federal agencies and review of past environmental documentation.

<u>Noise</u>

Proposed construction and demolition activities at all locations associated with the Proposed Action or alternatives would be conducted during the daytime hours of 0700 to 1700. Use of heavy equipment may cause an increase in sound that is notably above the ambient level in the immediate region. Short-term minor increases in noise from construction and demolition are expected. Due to the repositioning of the Main Gate, the shift in the traffic pattern may result in a negligible long-term increase in noise to some areas of base housing. Impacts would be intermittent and localized around the site and therefore insignificant when considering the existing noise environment.

<u>Safety</u>

The proposed construction and demolition activities from the implementation of the Proposed Action or alternatives would not impact health and safety. Companies and individuals contracted to perform construction activities on Air Force installations are responsible for adhering to Occupational Safety and Health Administration (OSHA) requirements to mitigate hazards. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and the availability and use of safety data sheets, the latter of which are also the responsibility of construction contractors to provide to workers. Individuals tasked to operate and maintain equipment, such as power generators, are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

Upon completion of airfield improvements, there would be long-term beneficial improvements to airfield safety through improved efficiency and increased aircraft separation on arm/dearm pads.

During construction activities and rerouting of traffic lanes to the new Main Gate, traffic flow may be disrupted. This may create short-term adverse impacts on safety due to slowed traffic and increased congestion on Highway 70W. Upon completion of the Main Gate relocation under the three action alternatives, there would be a long-term beneficial impact on safety by improving the flow of traffic entering the base during peak hours.

Repositioning of the La Luz Gate under Alternative 1 or rerouting traffic and adding identification check lanes in Alternative 2 may temporarily disrupt traffic flow on La Luz Gate Road and create minor, short-term adverse impacts to safety by increasing congestion at the gate. Upon completion of the La Luz Gate relocation under Alternative 1, there would be long-term beneficial impacts on safety due to the reduction in response time of first responders to the La Luz Gate in the event of an emergency. There would be no impact to health and safety from closing and demolishing the existing La Luz Gate facilities under Alternative 3. The Proposed Action or alternatives would not impact explosive safety and would improve airfield safety by enhancing efficiencies and decreasing the need to use Runway 07/25 for taxiing during certain weather conditions.

Air Quality

The Proposed Action or alternatives would result in a short-term, minor adverse impact on air quality. Emissions of criteria pollutants and greenhouse gases would be produced from demolition activities. This one-time emission of criteria pollutants and greenhouse gases would not meaningfully contribute to the potential effects of global climate change or other environmental trends.

The Proposed Action or alternatives would not interfere with the region’s ability to maintain compliance with National Ambient Air Quality Standards for attainment area pollutants.

Biological Resources

The construction activities associated with the Proposed Action for the airfield and Main Gate would take place in areas previously disturbed and maintained, and the development of this land would not have significant impacts. During construction activities, soil surfaces, including existing vegetation, would be cleared, graded, trenched, and leveled. After demolition of obsolete structures, areas would be landscaped using xeriscaping techniques that are designed to eliminate or reduce the need for irrigation, as well as drought-tolerant native plants adapted to the region’s climate that would provide long-term, beneficial impacts.

Construction of the La Luz Gate under Alternative 1 would take place on undisturbed land. Prior to the start of construction, the contractor would be required to implement pre-construction BMPs and obtain permits to limit the displacement of native plants. The net loss of previously undisturbed native vegetation from the construction of the La Luz Gate would be minor. As such, there would be long-term, minor adverse impacts to native vegetation. Under Alternative 2, the addition of traffic lanes at the current La Luz Gate location may impact both disturbed land and previously disturbed lands; however, the amount of vegetation that would be disturbed is small. As such, there may be long-term, minor impacts to native vegetation. Upon completion of demolition of the existing La Luz Gate under Alternative 3, landscaping actions would provide long-term, beneficial impacts to native vegetation.

Potential impacts to wildlife and habitat from implementation of the Proposed Action or alternatives are expected to be short-term, adverse, and minor. Construction and demolition activities may cause minor, short-term disturbances to wildlife that may inhabit the proposed locations or adjacent sites. Some mortality of wildlife may occur, though it would not result in long-term adverse impacts to wildlife populations. Potential negligible long-term adverse impacts to the federal candidate monarch butterfly may occur from the removal of native vegetation during the relocation of the La Luz Gate under Alternative 1. No adverse impacts to other federal or state listed species from the Proposed Action or alternatives will occur. There would be no impacts to federal or state listed species under the La Luz Gate Alternatives 2 or 3. Short-term, minor adverse impacts on burrowing owls, if they are present, may occur from the Proposed Action or alternatives. Revegetation after the demolition of the La Luz Gate facilities under Alternative 2 would provide additional wildlife habitat, resulting in long-term minor beneficial impacts. There would be no impacts on invasive species control under the Proposed Action and alternatives.

Cultural Resources

Under Alternative 1, there are no historic properties within, adjacent to, or in the general vicinity of the portion of the Area of Potential Effect (APE) associated with the airfield and Main Gate. As such, no historic properties would be affected by proposed improvements to the airfield and Main Gate locations. There are no historic properties within the portion of the APE associated with the proposed location of the new La Luz Gate. Three recorded archaeological sites are located in the general vicinity of the proposed new La Luz Gate location; however, construction activities under Alternative 1 would not diminish or otherwise impact the integrity of these sites and therefore, per 36 CFR § 800.4, no historic properties would be affected by implementation of Alternative 1.

There are no significant archaeological sites, traditional cultural properties (TCPs), or architectural resources within, adjacent to, or in the general vicinity of the portion of the APE associated with the current and proposed La Luz Gate locations. Therefore, per 36 CFR § 800.4, no historic properties would be affected by implementation of Alternative 2 or Alternative 3.

Federally recognized Native American Tribes were contacted in the preparation of the EA, and responses will be included in the Final EA. No traditional cultural properties or sacred sites have been identified within the APE. The New Mexico State Historic Preservation Office has been contacted to ensure details regarding this project can be reviewed.

Transportation

The increased capacity for F-16 staging at EORs and the extension of taxiways L and J under the Proposed Action and alternatives would have a major long-term beneficial impact on airfield efficiency. The repositioning of the Main Gate and La Luz Gate under Alternative 1 would result in compliance with AT/FP requirements, improved traffic flow, and increased efficiency in processing vehicles. The proposed improvements to the Main Gate would result in long-term beneficial impacts, and improvements associated with La Luz Gate would result in a minor beneficial impact on transportation. The increase in traffic lanes and renovation of facilities at the La Luz Gate under Alternative 2 would increase efficiency at peak use hours and result in minor long-term beneficial impacts. Closing the La Luz Gate under Alternative 3 would increase the use of the Main and West Gates, resulting in a long-term minor impact to traffic flow at these access points.

Water Resources

The Proposed Action and alternatives would have no appreciable effect on daily water use at Holloman AFB. While the aquifer underlying the installation is non-potable and not regulated, BMPs and planning during construction and demolition activities would control runoff and ensure no direct access to groundwater recharge points. Therefore, there would be no impacts on groundwater resources. For the proposed improvements, a Stormwater Pollution Prevention Plan would be implemented, and impacts from erosion and offsite sedimentation would be negligible. There are no floodplains associated with any airfield improvements so there would be no impacts. The proposed siting location for the La Luz Gate under Alternative 1 falls between floodplains associated with the Rita and Malone Draws. However, the project area itself is flat and elevated relative to the draws and falls outside of these floodplains, so no impacts to floodplains would result from the relocation of the La Luz Gate. No impacts to water resources would occur from the renovation of the La Luz Gate under Alternative 2 or closure and demolition of the La Luz Gate under Alternative 3.

Geological Resources

The construction and demolition activities associated with the Proposed Action and alternatives for airfield improvements would result in no impacts to geology, potential long-term negligible adverse impacts to topography, and short-term minor adverse impacts to soil resources. All airfield projects would occur on previously disturbed land. The proposed repositioning of the Main Gate would result in long-term negligible adverse impacts to geology and short-term minor adverse impacts to topography and soil resources. After demolition of the existing Main Gate, the area would be graded to level and undergo soil stabilization measures. As with the airfield projects, actions would occur on previously disturbed land and, after demolition of degraded or excess pavement, the area would be graded to level and undergo soil stabilization measures.

The proposed relocation of the La Luz Gate under Alternative 1 would result in potential long-term negligible adverse impacts to geology and topography and short-term minor adverse impacts to soil resources. Projects under this alternative would occur on undisturbed land, but the amount of change would be small. After demolition of the existing La Luz Gate, the area would be graded to level, undergo soil stabilization measures, and be returned to a more natural topography.

Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances

Short-term minor adverse impacts on hazardous materials and wastes would occur during construction and demolition activities associated with the Proposed Action from the generation of negligible amounts of hazardous wastes. Additional hazardous wastes would be generated in the form of debris from demolition processes. Contractors would be required to adhere to all federal, state, and local regulations governing the storage, management, and disposal of hazardous materials and wastes. There would be no impacts from daily operation of the new facilities and structures.

Short-term minor adverse impacts from toxic hazards would occur during demolition and construction processes. Surveys would be performed by certified personnel to determine the presence and extent of any hazardous materials prior to demolition. Plans would be generated based on the results of the exploratory surveys to identify any areas where controls may be necessary to reduce the hazards to workers and prevent the release of toxic materials from the site.

Mitigation

The EA analysis concluded that the Proposed Action would not result in adverse environmental impacts; therefore, no mitigation measures are required. BMPs are described and recommended in the EA where applicable.

Conclusion

Finding of No Significant Impact. After review of the EA prepared in accordance with the requirements of the National Environmental Policy Act; the Council on Environmental Quality regulations; and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP) (1999), and which is hereby incorporated by reference, I have determined that the Proposed Action (Alternative 1), Alternative 2, and Alternative 3 or alternatives would not have a negative impact on the quality of the human or natural environment. Accordingly, an Environmental Impact Statement will not be prepared. This decision has been made after considering all submitted information, including a review of agency comments submitted during the 30-day public comment period, and considering a full range of practical alternatives that meet project requirements and are within the legal authority of the United States Air Force.

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JUSTIN B. SPEARS, Colonel, USAF **DATE**
Commander, 49th Wing

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LIST OF ACRONYMS AND ABBREVIATIONS

49 WG	49th Wing
49 SFS	49th Security Forces Squadron
ac	acre(s)
ACAM	Air Force Air Conformity Applicability Model
ACM	asbestos-containing material
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
Air Force	United States Air Force
APE	Area of Potential Effect
APZ	Accident Potential Zone
AST	aboveground storage tank
AT/FP	Anti-Terrorism/Force Protection
Air Force	United States Air Force
BMP	best management practice(s)
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CZ	Clear Zone(s)
DAFMAN	Department of the Air Force Manual
dB	decibels
dBA	A-weighted decibels
DNL	day/night sound level
DOD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EMS	Environmental Management System
EO	Executive Order
EOR	End of the Runway
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
ft	feet
FTU	Formal Training Unit
GHG	greenhouse gas(es)
HAZMAT	hazardous materials
HAR	Holloman Archeological Resource
IPaC	Information for Planning and Consultation
LA	New Mexico Laboratory of Anthropology
LBP	lead-based paint
MMRP	Military Munitions Response Program
NAAQS	National Ambient Air Quality Standards
NM	New Mexico
NEPA	National Environmental Policy Act
NH_3	ammonia
NHPA	National Historic Preservation Act
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NO_2	nitrogen dioxide

NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O3	ozone
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PM_{10}	suspended particulate matter measured less than or equal to 10 microns in diameter
$PM_{2.5}$	suspended particulate matter measured less than or equal to 2.5 microns in diameter
Q-D	Quantity-Distance
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SO_x	sulfur oxide
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traditional Cultural Properties
THPO	Tribal Historic Preservation Officers
UFC	Unified Facilities Criteria
U.S.C.	United States Code
US	United States
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compounds
WSMR	White Sands Missile Range

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The 49th Wing (49 WG) at Holloman Air Force Base (AFB), New Mexico, has identified construction, renovation, infrastructure, and demolition projects that improve installation access and air operations safety. The 49 WG proposes to implement these projects in a phased approach over a 3-year period beginning in 2025, with airfield improvements as the first priority. Projects are estimated to be completed in 2028. This Environmental Assessment (EA) was prepared to evaluate the potential environmental impacts associated with installation development activities in compliance with the *National Environmental Policy Act* (NEPA) (42 United States Code [U.S.C.] § 4331 et seq.); regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] Parts 1500–1508); and the United States (US) Air Force's (Air Force's) Environmental Impact Analysis Process (EIAP) Regulations at 32 CFR Part 989, *Environmental Impact Analysis Process*.

The intent of the proposed projects is to provide improvements necessary to support the mission of the 49 WG and tenant units. The proposed projects were identified as priorities for the installation for the improvement of the physical infrastructure and functionality of Holloman AFB, including current and future mission and facility requirements, development constraints and opportunities, and land use planning goals.

1.2 LOCATION

The 49 WG supports the F-16 Fighting Falcon, T-38 Talon, and MQ-9 Reaper remotely piloted aircraft. The 54th Fighter Group is an F-16 Formal Training Unit (FTU) and a unit of the 49 WG. Holloman AFB is also home to the 635th Material Maintenance Group and the 704th Test Group. Holloman AFB provides support for the US Army's White Sands Missile Range (WSMR) military testing area as well as the White Sands Space Harbor for National Aeronautical and Space Administration missions.

Holloman AFB is in southern New Mexico about 95 miles north of the Texas border (**Figure 1-1**). It is in Otero County, New Mexico, 6 miles southwest of Alamogordo. The main base encompasses 51,813 acres (ac), is bounded to the west by the White Sands National Monument and to the south by Highway 70, and supports about 21,000 active-duty Air Force, Air National Guard, Air Force Reserve, retirees, Department of Defense (DOD) civilians and their family members.

1.3 PURPOSE OF THE ACTION

The purpose of the Proposed Action is to allow the Air Force to make improvements to the airfield and reposition the Main Gate and La Luz Gate (also known as the North Gate) on Holloman AFB. The airfield improvements would consist of expanding the number of end of the runway (EOR) arm/dearm pads from 23 to 48 to increase stage, arm and launch volume; increasing blast dissipation pavement; providing shelter for EOR crews; and extending two taxiways to improve airfield geometry. In addition, excess buildings located within and adjacent to the planned routes for the taxiway extensions would be demolished. These improvements would enhance airfield efficiency to alleviate safety, operational and training shortfalls, as well as decrease the need to frequently use Runway 07/25 for taxiing during certain weather conditions. Taxiway extensions would allow for improved F-16 recovery and taxiway circulation and overall airfield efficiency.

The Proposed Action would also include repositioning the Main Gate and La Luz Gate and adding additional access control facilities. The proposed changes would improve gate security, increase safety, and reduce traffic congestion. These base access points in their existing configuration do not meet current Anti-Terrorism/Force Protection (AT/FP) standards and are not adequate for the volume of traffic entering Holloman AFB at peak hours. At the Main Gate, traffic frequently backs up to the US 70 deceleration lane. The La Luz Gate is located on private land and is the only access to Holloman AFB from the north side of the base. Due to the distance of the La Luz Gate from the main base cantonment area, the response time for Security Forces and other first responders is not adequate. Proposed improvements at these

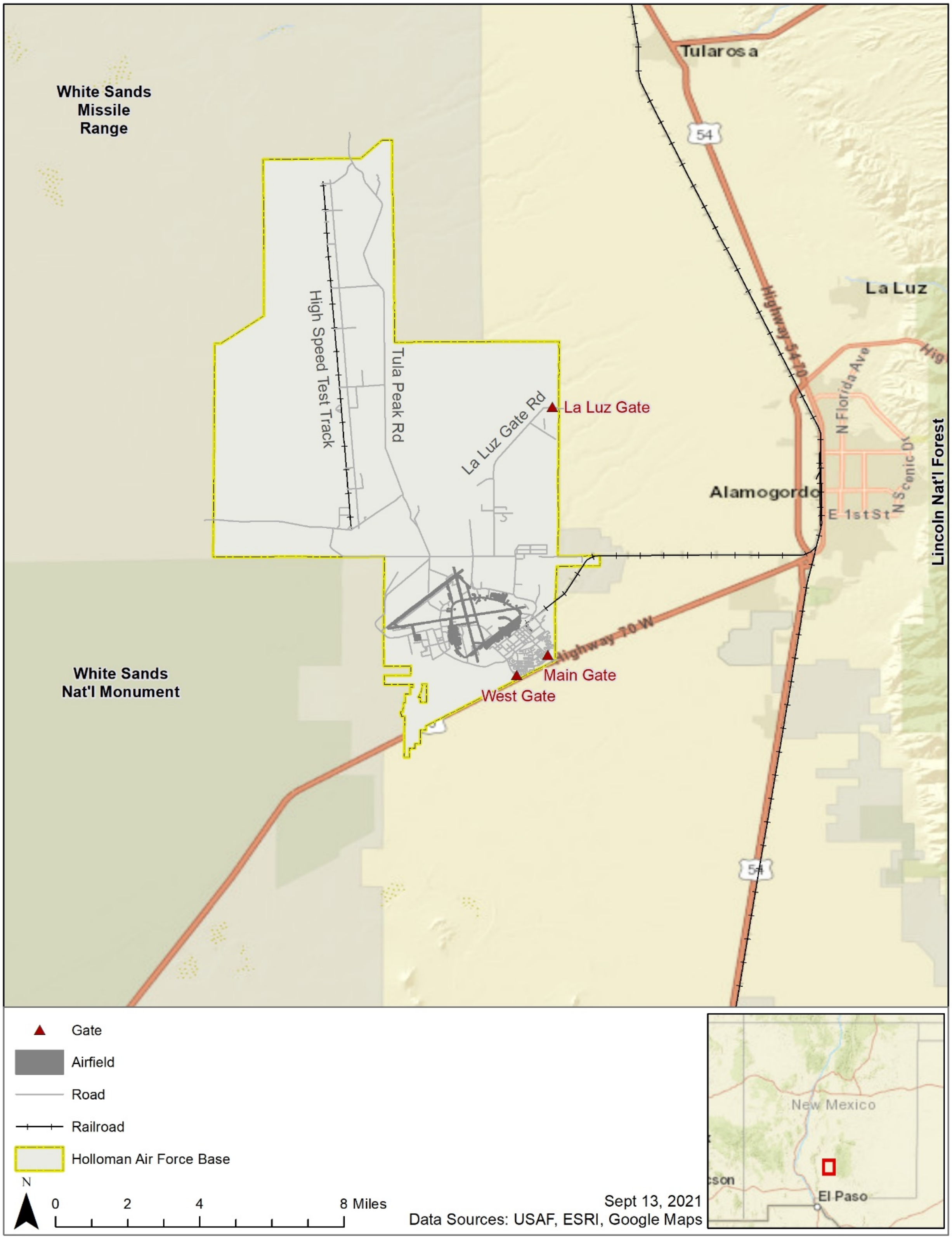


Figure 1-1. Location of Holloman Air Force Base

access points would increase and expand security infrastructure and decrease response time, increase the capacity for vehicles awaiting base access, expand the number of identification check lanes and the truck inspection capacity to facilitate entry, and improve overall visitor processing capacity.

1.4 NEED FOR THE ACTION

Holloman AFB needs to provide airfield and access control points and infrastructure that are adequate to meet the mission requirements of the 49 WG and its tenant units in a manner that:

- Meets all applicable DOD installation master planning criteria, consistent with Unified Facilities Criteria (UFC) 2-100-01, *Installation Master Planning;* UFC 3-260-01, *Airfield and Heliport Planning and Design*, Department of the Air Force Manual (DAFMAN) 32-1084, *Facility Requirements*; Air Force Instruction (AFI) 32-1015, *Integrated Installation Planning*; and Air Force Policy Directive (AFPD) 32-10, *Installations and Facilities;*
- Meets applicable DOD antiterrorism and force protection criteria, consistent with UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*, and the Air Force Installation Force Protection Guide;
- For access control points, meets the following: UFC 4-022-01, *Entry Control Facilities Access Control Points*; UFC 4-022-02, *Selection and Application of Vehicle Barriers*; Air Force Civil Engineer Center (AFCEC) document *Facilities Dynamic Prototypes Design: Installation Access Control Points (*ECF/IACP*);* and US Army Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) Pamphlet 55-15, *Traffic and Safety Engineering for Better Entry Control Facilities.*
- Supports and enhances the morale and welfare of personnel assigned to the installation, their families, and civilian staff, consistent with DOD Instruction 1015.10, *Military Morale, Welfare, and Recreation Programs*;
- Conforms to the Air Force and Major Command building design and construction guidance and the Holloman AFB Architectural Compatibility Guide to ensure a consistent and coherent architectural character throughout the base;
- Achieves the goals and objectives laid out in the Holloman AFB Installation Development Plan; and
- Is consistent with findings of the applicable Facility Sustainment, Restoration, and Modernization Planning Charrette Reports.

1.5 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND CONSULTATION

The environmental analysis process, in compliance with NEPA guidance, includes public and agency review of information pertinent to the Proposed Action and alternatives. Furthermore, compliance with Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA) requires consultation with the US Fish and Wildlife Service (USFWS) and the State Historic Preservation Office (SHPO), respectively. Tribal consultation is also required under the NHPA. Information about stakeholder coordination, public and agency review, as well as the letters and responses, are included in **Appendix A**.

1.6 APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS

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

1.6.1 National Environmental Policy Act

NEPA requires that federal agencies consider the potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed federal decisions. The Council on Environmental Quality was established under NEPA to implement and oversee federal policies as they relate to this process. In 1978, the CEQ issued Regulations for Implementing the

Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500 through 1508 [CEQ 1978]). On 14 September 2020, the CEQ updated NEPA rules, subject to congressional review (85 Federal Register 43304 through 43376), which are being followed for this EA. CEQ regulations specify that an EA be prepared to

- briefly provide sufficient analysis and evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI);
- aid in an agency's compliance with NEPA when no EIS is necessary; and
- facilitate preparation of an EIS when one is necessary.

Further, to comply with other relevant environmental requirements (e.g., the ESA and NHPA) in addition to NEPA and to assess potential environmental impacts, the EIAP and decision-making process for the Proposed Action and alternatives involves a thorough examination of environmental issues potentially affected by government actions subject to NEPA.

The EIAP is the process by which the Air Force facilitates compliance with environmental regulations (32 CFR Part 989), including NEPA, which is the primary legislation affecting the agency's decision-making process.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

This EA evaluates the potential environmental impacts that may arise from proposed airfield and access control point projects, which include the installation of additional pavement, the construction of new facilities, and subsequent demolition of degraded and excess facilities and pavement. Alternative 1 includes medium- and long-range airfield improvement projects and the repositioning of the Main Gate and La Luz Gate (**Table 2-1**). Alternative 2 would be limited to smaller scale airfield projects and the construction of fewer new facilities at the Main and La Luz Gates.

2.2 ALTERNATIVE SELECTION PROCESS

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

1) **Mission**: Compatible with the existing, ongoing military missions and activities at Holloman AFB.
2) **Land use**: Consistent with land use requirements and planning concepts as defined in the 2016 Installation Development Plan and other DOD and Air Force installation and facility planning guidance.
3) **Minimize inefficiencies**: Minimizes operational inefficiencies and promotes sustainable development.
4) **Access Control Point Security**: Meets the criteria required for AT/FP and access control points.
5) **Safety**:
    a) **Airfield:** Improves safety and enhances the movement of aircraft traversing the airfield and does not increase the potential for accidents or damage to aircraft.
    b) **Access Control Points:** Reduces congestion and improves the movement of traffic through access control points.

2.2.1 Alternatives Considered

The NEPA and CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Action. "Reasonable alternatives" are those that could also be used to meet the purpose of and need for the Proposed Action. The NEPA process is intended to support flexible, informed decision-making; the analysis provided in this EA and feedback from stakeholders will inform decisions made about whether, when, and how to execute the Proposed Action. Among the alternatives considered is the No Action Alternative, which evaluates the potential consequences of not undertaking the Proposed Action and serves to establish a comparative baseline for analysis. This section presents reasonable alternatives for evaluation and assesses them relative to the selection standards. **Table 2-1** provides a comparison of the alternatives considered. A description of the alternatives carried forward for detailed analysis are described in **Section 2.3**, and those eliminated from detailed analysis are described in **Section 2.4**.

2.2.1.1 Airfield Improvements

- Alternative 1 - Expand the number of F-16 arming positions at Taxiway A and EORs B, D and E, and replace markings on the Apron Parking. Extend Taxiway L and Taxiway J.

- Alternative 2 - Expand the number of F-16 arming positions at Taxiway A and EORs B, D and E, and replace markings on the Apron Parking. Construct additional taxiways that are parallel to Runways 04-22 and 16-34.

2.2.1.2 Access Control Point Improvements

- Main Gate
    - Alternative 1 - Reposition the gate to increase the length of entry lanes and the number of identification check lanes, and construct a new Visitors Center, vehicle inspection bay, and security facilities.
    - Alternative 2 - Renovate existing Main Gate facilities and one additional traffic lane and identification check lane.
- La Luz Gate
    - Alternative 1 - Relocate the gate approximately 3.0 miles south of the current location to include a guardhouse, identification check lanes, vehicle inspection station, and security facilities.
    - Alternative 2 - Renovate existing La Luz Gate facilities.
    - Alternative 3 - Permanently close the La Luz Gate and demolish the current facilities.
    - Alternative 4 - Relocate the gate approximately 3.3 miles south of the current location to include a guardhouse, identification check lanes, vehicle inspection station, and security facilities.

2.2.2 No Action

Analysis of the No Action Alternative provides a benchmark, enabling decision-makers to compare the magnitude of the potential environmental effects of the Proposed Action. NEPA requires an EA to analyze the No Action Alternative. No action means that the Proposed Action would not take place. No action for this EA means that airfield improvements would not occur, and the Main Gate and La Luz Gate would not be repositioned, resulting in safety concerns not being addressed and continued inefficiencies on the airfield and at the Main and La Luz Gates.

Table 2-1. Comparison of Alternatives

Alternative Actions	**Selection Standard**					**Meets Purpose and Need**
	1. Missions	**2. Land Use**	**3. Minimize Inefficiencies**	**4. Security**	**5. Safety**	
Airfield						
Airfield Alternative 1 - Expand EOR arming positions and extend Taxiway L and J	Yes	Yes	Yes	NA	Yes	**Yes**
Airfield Alternative 2 - Expand EOR arming positions, add taxiways parallel to Runways 04-22 and 16-34	Yes	Yes	No	NA	Yes	**No**

Table 2-1. Comparison of Alternatives

Alternative Actions	Selection Standard					Meets Purpose and Need
	1. Missions	2. Land Use	3. Minimize Inefficiencies	4. Security	5. Safety	
Main Gate						
Main Gate Alternative 1 - Reposition gate	Yes	Yes	Yes	Yes	Yes	**Yes**
Main Gate Alternative 2 - Renovate existing facilities	Yes	Yes	No	No	No	**No**
La Luz Gate						
La Luz Gate Alternative 1 - Relocate gate 3.0 miles south	Yes	Yes	Yes	Yes	Yes	**Yes**
La Luz Gate Alternative 2 - Renovate existing facilities	Yes	Yes	Yes	Yes	Yes	**Yes**
La Luz Gate Alternative 3 - Close gate and demolish facilities	Yes	Yes	Yes	Yes	Yes	**Yes**
La Luz Gate Alternative 4 - Relocate 3.3 miles south	Yes	Yes	No	Yes	Yes	**No**

EOR=end of the runway; NA=not applicable

2.3 Description of the Alternatives Considered for Detailed Analysis

The Air Force uses several guidelines and instructions in determining the best approach for construction, renovation, and demolition. AFI 32-1023, *Designing and Constructing Military Construction Projects*, implements AFPD 32-10 and Military Standard 3007F, *Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications*. AFI 32-1023 provides guidance on Air Force military construction projects, including general design criteria and standards on construction management. DAFMAN 32-1084 provides guidance for determining space allocations for Air Force facilities and may be used to program new facilities or evaluate existing spaces.

Alternatives with the potential to meet the purpose of and need for each proposed action were considered. **Table 2-2** summarizes the actions that are proposed as part of each alternative. The locations for each suggested project are shown in **Figures 2-1** through **2-5.** The improvement projects would be staggered and are proposed to start in 2025, with an estimated construction schedule of 12 to 24 months for each project. The estimated completion date for all projects would be in 2028. The specific schedule is dependent on the timing of the design schedule and construction window relative to regional weather.

2.3.1 Airfield Improvements

2.3.1.1 Alternative 1

Seven projects are proposed under this alternative (**Figure 2-1**). Airfield improvements would include the expansion of four EOR arm/dearm pads and construction of new crew shelters at EOR B, D, and E, and Taxiway A; re-marking apron parking pavement; and extending two taxiways, L and J. Projects would include the subsequent demolition of excess buildings and degraded pavement that are within or adjacent to the airfield areas proposed for improvements. Additional details are provided in **Table 2-2**.

2.3.1.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvement projects would not occur. Activities that occur on existing ramps and taxiways would continue to operate under substandard, congested conditions, and inefficient workarounds to meet mission requirements would continue. Failure to complete the needed airfield improvements would degrade the 49 WG's ability to accomplish its mission.

2.3.2 Main Gate Improvements

2.3.2.1 Alternative 1

Under this alternative, the Main Gate would be repositioned, and the access control point would increase to four identification check lanes, shifting the orientation of traffic lanes to decrease the potential for traffic to back up onto main thoroughfares. A new Visitors Center, guardhouse, vehicle inspection building with two vehicle inspection bays, and an overwatch tower or pad would be constructed (**Figures 2-2 and 2-3**). Additional details are provided in **Table 2-2**. The potential area of ground disturbance would include the actual construction footprints for the new structures or additions and the surrounding lands where construction-related clearing and grading would occur (the construction buffer areas). A construction buffer area of 50 feet (ft) around all construction footprints was added to the area of potential ground disturbance, for a total of approximately 24 acres (ac) of construction area and buffer. For construction activities, the anticipated depth of excavation required is approximately 10 ft below ground surface.

The existing Main Gate facilities would be demolished. Required demolition activities may include abating any asbestos and/or lead-based paint that is present; removing demolished debris, slabs, foundations, and footings; removing any buried storage tanks associated with the structures; removing and capping buried utilities; backfilling to original grade; and restoring vegetation or other surface preparation to prevent future erosion. Materials would be recycled to the maximum extent possible.

2.3.2.2 No Action Alternative

Under the No Action Alternative, the Main Gate would not be repositioned with the construction of new and additional facilities. Under the No Action Alternative, the Main Gate would not meet current AT/FP standards, diminishing base security. In addition, congestion at the Main Gate would continue during peak traffic hours, interfering with traffic flow and increasing the potential for accidents.

2.3.3 La Luz Gate Improvements

2.3.3.1 Alternative 1

Under Alternative 1, the La Luz gate would be moved an estimated 2.5 to 3 miles southwest of the current location on La Luz Gate Road within the base boundary. The proposed La Luz Gate relocation would be located approximately 1.5 miles west of the installation boundary. Security fencing and cable barriers would be extended on both sides of the road to the boundary. Construction would include three identification check lanes, a new gatehouse and identification check booths, a two-vehicle inspection station, an overwatch tower or pad, and other related facilities (**Figures 2-4 and 2-5**). Additional details are provided in **Table 2-2**. The potential area of ground disturbance would include the actual construction footprints for the new structures or additions and the surrounding lands where construction-related clearing and grading would occur (the construction buffer areas). A construction buffer area of 50 ft around all construction footprints was added to the area of potential ground disturbance, for a total of approximately 20 ac of construction area and buffer. For construction activities, the anticipated depth of excavation required is approximately 10 ft below ground surface.

The existing La Luz facilities would be demolished. Required demolition activities may include actions such as abating any asbestos and/or lead-based paint that is present; removing demolished debris, slabs, foundations, and footings; removing any buried storage tanks associated with the structures; removing and capping buried utilities; backfilling to original grade; and restoring vegetation or other surface preparation to prevent future erosion. Materials would be recycled to the maximum extent possible.

Table 2-2. Summary of Alternatives Considered for Detailed Analysis

Alternative	Description	Estimated Construction Start (Year)	Estimated Facility or Infrastructure Size	Estimated Demolition
Airfield Improvements				
Alternative 1	**Taxiway A - Increase F-16 arming positions from 4 to 6:** Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.	2025	153,677 ft^2 parking pavement 27,582 ft^2 shoulder pavement	--
	EOR B - Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.	2025	172,729 ft^2 parking pavement 42,038 ft^2 shoulder pavement	38,583 ft^2 pavement
	EOR D - Increase F-16 arming positions from 7 to 18: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.	2025	269,096 ft^2 parking pavement 64,497 ft^2 shoulder pavement	55,543 ft^2 pavement
	EOR E - Increase F-16 arming positions from 4 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings.	2025	153,229 ft^2 parking pavement 54,108 ft^2 shoulder pavement	2,770 ft^2 parking pavement 42,955 ft^2 shoulder pavement
	Apron Parking: Remove existing markings, add new markings specific for F-16 dimensions.	2025	1,742,400 ft^2	--
	Taxiway L: Extend taxiway from Runway 7-25 to Runway 04-22	2025	1,031,450 ft^2 parking pavement 650,252 ft^2 shoulder pavement	214,050 ft^2 parking pavement 206,919 ft^2 shoulder pavement
	Taxiway J: Extend taxiway from Taxiway A to Taxiway R	2025	1,446,619 ft^2 parking pavement 756,637 ft^2 shoulder pavement	173,971 ft^2 parking pavement 165,829 ft^2 shoulder pavement

Table 2-2. Summary of Alternatives Considered for Detailed Analysis

Alternative	Description	Estimated Construction Start (Year)	Estimated Facility or Infrastructure Size	Estimated Demolition
Main Gate				
Alternative 1	Reposition gate entrance, construct a new Visitors Center, guardhouse, four identification check lanes, a vehicle inspection building with two vehicle inspection bays, and an overwatch tower or pad. Demolish current facilities and excess pavement.	2026	New: • 223,331 ft^2 roadway pavement • 15,857 ft^2 parking • 2,004 ft^2 Visitors Center • 1,901 ft^2 pedestrian pavement • 467 ft^2 guardhouse • 5,880 ft^2 canopy • 36 ft^2 ID check booths • 1,340 ft^2 vehicle inspection station • 49 ft^2 overwatch tower/pad	• 123,782 ft^2 traffic lane and parking pavement • 2,190 ft^2 Visitors Center • 430 ft^2 gatehouse • 3,972 ft^2 canopy • 160 ft^2 guard structures • 3,614 ft^2 vehicle inspection
La Luz Gate				
Alternative 1	Relocate gate entrance approximately 2.5 to 3 miles south, to include a guardhouse, three identification check lanes with booths, a 2-lane inspection building, and an overwatch tower or pad. Extend security fence and cable barriers to meet the relocated entrance. Demolish current facilities and excess pavement.	2027	New: • 142,429 ft^2 roadway and parking pavement • 15,840 ft new fencing • 467 ft^2 guardhouse • 5,880 ft^2 canopy • 36 ft^2 ID check booths • 1,340 ft^2 inspection building • 49 ft^2 overwatch tower	• 34,240 ft^2 traffic lane and parking pavement • 3,614 ft^2 vehicle inspection • 430 ft^2 gatehouse • 3,972 ft^2 canopy • 160 ft^2 guard structures
Alternative 2	Renovate current facilities, expand to three identification check stations with booths, add a 2-lane inspection building and an overwatch tower or pad.	2027	New: • 132,509 ft^2 roadway pavement Renovate: • 3,614 ft^2 vehicle inspection • 430 ft^2 gatehouse • 3,972 ft^2 canopy160 ft^2 guard structures	--

Table 2-2. Summary of Alternatives Considered for Detailed Analysis

Alternative	Description	Estimated Construction Start (Year)	Estimated Facility or Infrastructure Size	Estimated Demolition
Alternative 3	Permanently close and demolish current facilities and excess pavement. Erect a gate across La Luz Gate Road at base boundary.	2027	--	• 34,240 ft^2 traffic lane and parking pavement • 3,614 ft^2 vehicle inspection • 430 ft^2 gatehouse • 3,972 ft^2 canopy • 160 ft^2 guard structures

ac=acres, EOR=end of the runway; ft^2=square feet; ID=identification

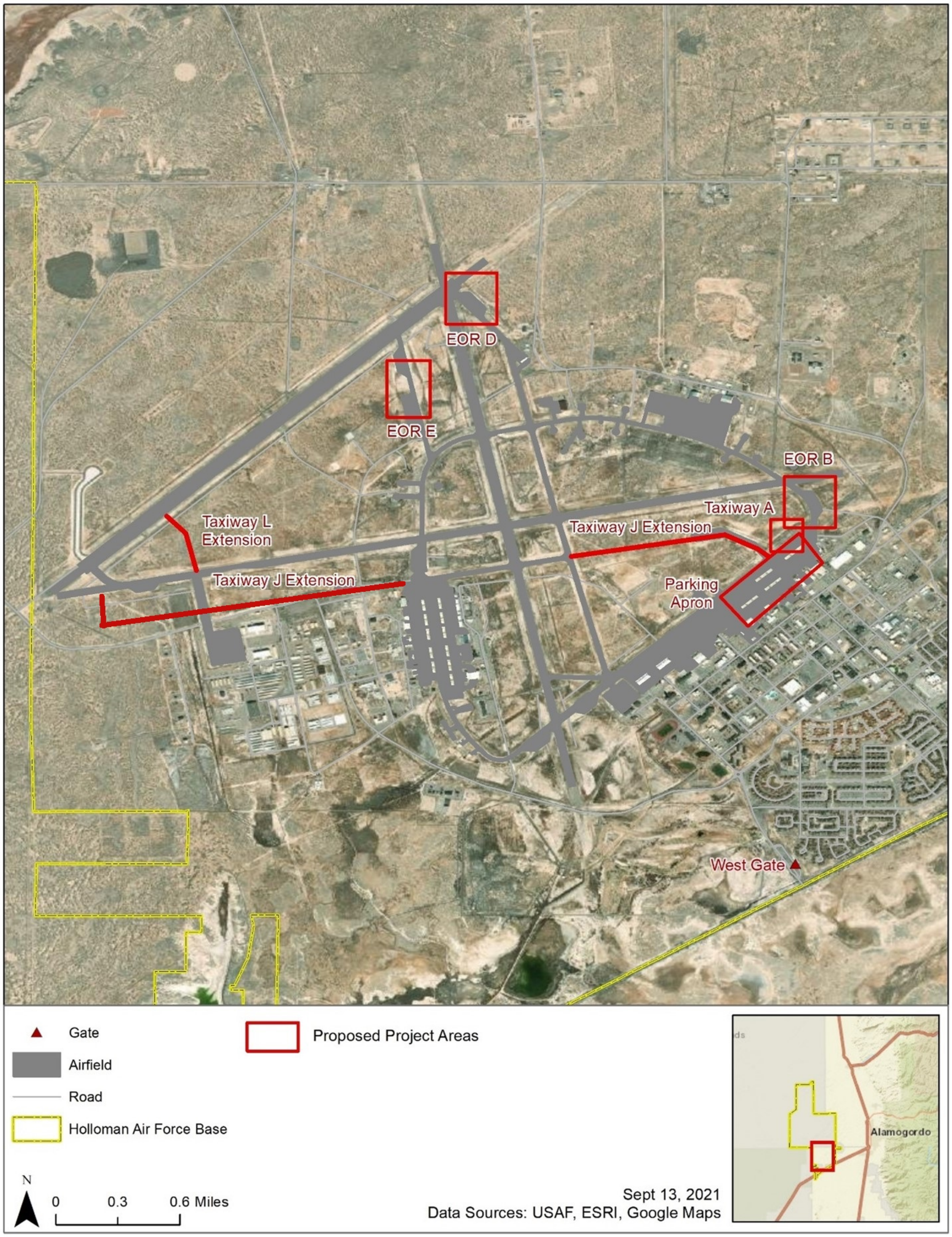


Figure 2-1. Location of the Proposed Actions for Airfield Improvement

1

2 **Figure 2-2. Location of the Proposed Main Gate Repositioning**

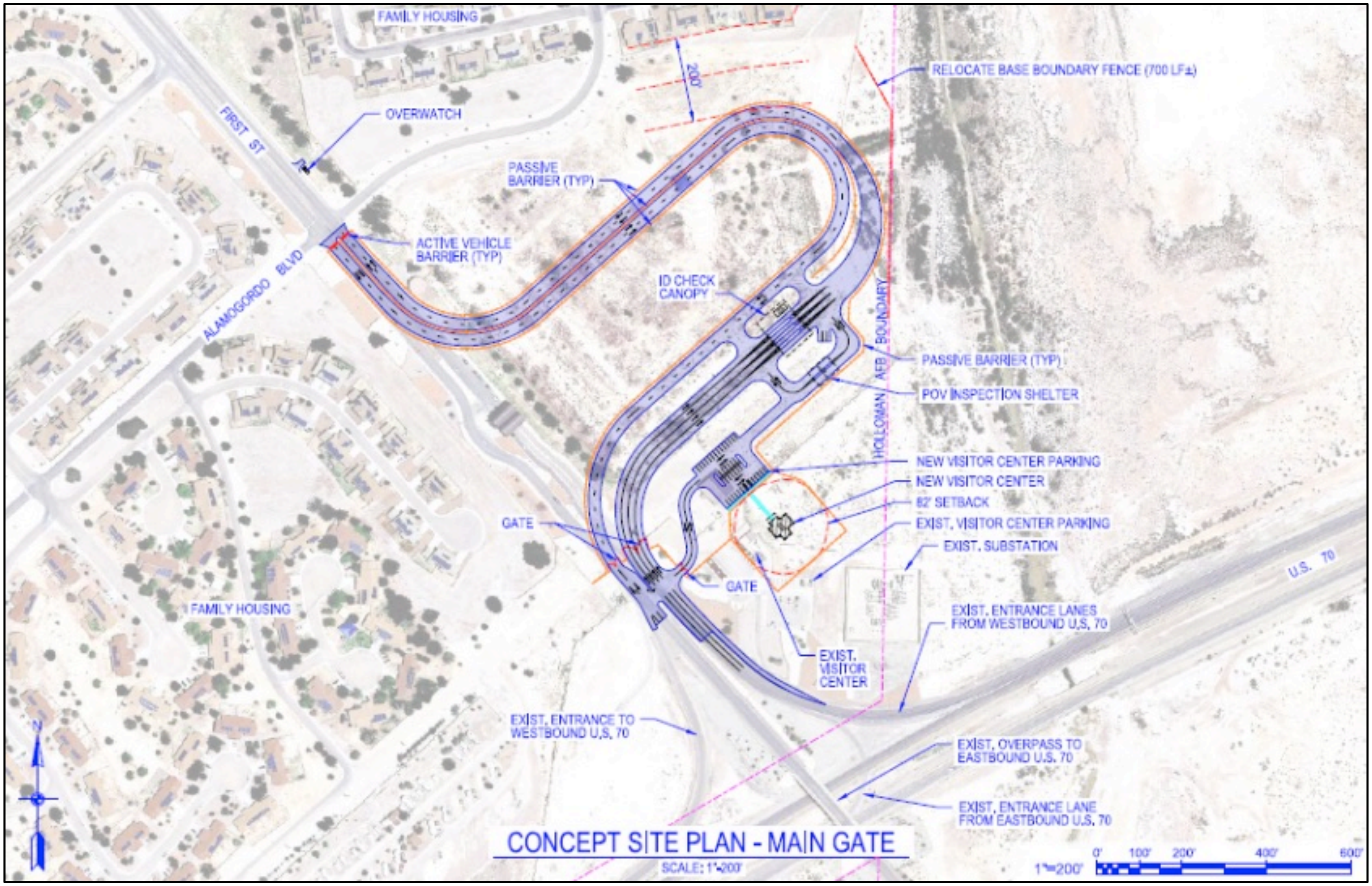


Figure 2-3. Proposed Site Plan for the Main Gate Repositioning

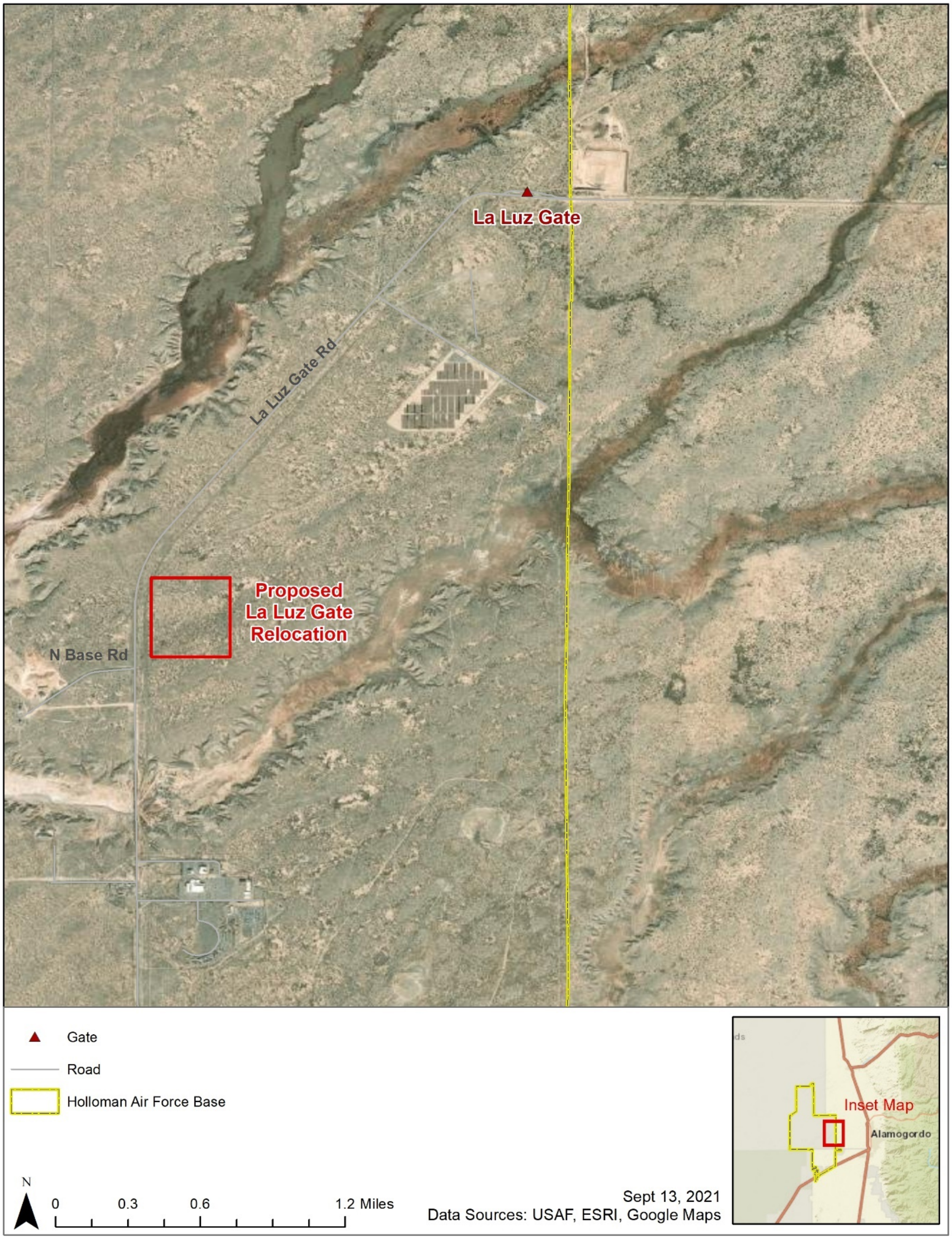


Figure 2-4. Location of the Proposed La Luz Gate Relocation

Figure 2-5. Proposed Site Plan for the La Luz Gate Relocation

2.3.3.2 Alternative 2

Alternative 2 would include renovating the current La Luz Gate facilities, rerouting and adding additional identification check lanes, and adding additional security infrastructure (i.e., overwatch tower or pad). For construction activities, the anticipated depth of excavation required is approximately 10 ft below ground surface. Renovation activities may include actions such as abating any asbestos and/or lead-based paint that is present and removing old, useless, and worn debris. Materials would be recycled to the maximum extent possible.

2.3.3.3 Alternative 3

Under Alternative 3, the La Luz Gate would be permanently closed, and the current facilities would be demolished. A gate that could be used for emergency access would be added on La Luz Gate Road to close the base boundary fence. Required demolition activities may include actions such as abating any asbestos and/or lead-based paint that is present; removing demolished debris, slabs, foundations, and footings; removing any buried storage tanks associated with the structures; removing and capping buried utilities; backfilling to original grade; and restoring vegetation or other surface preparation to prevent future erosion. Materials would be recycled to the maximum extent possible.

2.3.3.4 No Action Alternative

Under the No Action Alternative, the La Luz Gate would remain in its current location with its existing configuration and facilities. The La Luz Gate would not meet current AT/FP standards and increased response time for Security Forces and other first responders would continue, diminishing base security, safety, and access.

2.4 Alternatives Eliminated from Further Consideration

Airfield Alternative 2. This alternative, which would expand the number of F-16 arming positions at Taxiway A and EORs B, D and E, replace markings on the apron parking, and construct additional taxiways that are parallel to Runways 04-22 and 16-34, does not meet the Selection Standard to minimize inefficiencies. Constructing two additional parallel taxiways would incur added time and expenses to improve taxiway efficiencies and reduce taxiway congestion that would be resolved through the addition of shorter taxiway extensions; therefore, this alternative was eliminated from further consideration.

Main Gate Alternative 2. This alternative, which would renovate the existing Main Gate facilities and add one additional traffic and identification check lane, does not meet the Selection Standards to minimize inefficiencies, meet minimum AT/FP standards, and improve safety at access control points. Due to the age and location of the existing facilities, renovations would still not meet current AT/FP standards. In addition, leaving the facilities in their present position would not alleviate traffic congestion or solve the current safety issues with traffic during peak hours. This alternative was eliminated from further consideration.

La Luz Gate Alternative 4. This alternative, which would relocate the La Luz Gate approximately 3.3 miles south of the current location, does not meet the Selection Standard to minimize inefficiencies. While locating the La Luz Gate closer to the main cantonment would reduce Security Forces' response time, the time saved would be negligible. This option would incur additional costs and time needed to plan, budget, and construct an alternative route to provide access to the existing Combat Arms Training and Maintenance facility. The additional costs and time cannot be justified by the relatively short distance gained; therefore, this alternative was eliminated from further consideration.

2.5 Summary of Environmental Consequences

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

Table 2-3. Comparison of Potential Environmental Consequences of the Alternatives by Resource

Resource	Alternative 1 (Airfield, Main Gate, La Luz Gate)	Alternative 2 La Luz Gate	Alternative 3 La Luz Gate	No Action Alternative
Noise	Airfield – short-term and long-term negligible adverse impacts. Main Gate – short-term minor impacts; long-term negligible adverse impacts. La Luz Gate – short-term negligible adverse impacts.	Same as described in Alternative 1.	Same as described in Alternative 1.	No impacts to the noise environment.
Safety	Airfield – No impacts associated with construction and demolition with adherence to OSHA and AFOSH requirements. Beneficial impacts to airfield safety; no impacts to explosive safety. Main Gate – short-term, minor adverse impacts on traffic safety; long-term beneficial impacts following construction. La Luz Gate – short-term, minor adverse impacts on traffic safety; long-term beneficial impacts following construction.	Same as described in Alternative 1.	No impacts associated with demolition with adherence to OSHA and AFOSH requirements.	Safety, operational, and training inefficiencies would remain. AT/FP standards would not be met, and traffic backups would continue to create hazards at the Main Gate. Insufficient response time by emergency personnel would persist at the La Luz Gate.
Air Quality	Short-term, minor adverse impacts associated with construction emissions and increased particulate matter. No significant impact on climate change.	Same as described in Alternative 1.	Same as described in Alternative 1.	No impacts on air quality.

Table 2-3. Comparison of Potential Environmental Consequences of the Alternatives by Resource

Resource	Alternative 1 (Airfield, Main Gate, La Luz Gate)	Alternative 2 La Luz Gate	Alternative 3 La Luz Gate	No Action Alternative
Biological Resources	Vegetation – No impacts to native vegetation from airfield improvements or repositioning of the Main Gate. Long-term minor impacts to native vegetation from relocating the La Luz Gate. Long-term beneficial impacts on native vegetation following demolition of existing facilities and revegetation at the Main Gate and La Luz Gate. Wildlife – short-term, minor adverse impacts on wildlife and habitat. T&E Species – negligible impact on the federal candidate monarch butterfly with an Air Force determination of may affect, but not likely to adversely affect. A no effect determination on the federal and state listed least tern. No impact to the state listed White Sands pupfish. Potential short-term, minor adverse impact to the burrowing owl. No impacts on invasive species control.	Long-term, minor adverse impacts to native vegetation. Potential short-term, minor adverse impacts to wildlife. No impact to federal or state listed species. Potential short-term, minor adverse impacts to the burrowing owl. No impacts on invasive species control.	Long-term minor beneficial impacts to native vegetation. Long-term, minor beneficial impacts to wildlife. Long-term, minor beneficial impacts to T&E species. No impact on invasive species control.	No impacts on biological resources.

Table 2-3. Comparison of Potential Environmental Consequences of the Alternatives by Resource

Resource	Alternative 1 (Airfield, Main Gate, La Luz Gate)	Alternative 2 La Luz Gate	Alternative 3 La Luz Gate	No Action Alternative
Cultural Resources	No effect on historic properties including archaeological sites, TCPs, or architectural resources at the airfield, Main Gate and La Luz Gate locations. No effects to the historic roadbed with concurrence from the NM SHPO.	No effect on historic properties.	Potential effects would be the same as described in Alternative 2.	No impacts on historic properties.
Transportation	Major long-term beneficial impact on airfield efficiency. Long-term beneficial impact on transportation resources at the Main Gate. Long-term minor beneficial impact on transportation resources at the La Luz Gate.	Negligible beneficial impact on transportation resources.	Minor adverse impact on transportation resources.	Existing airfield inefficiencies, hazardous traffic conditions at the Main Gate, and inadequate emergency response time at the La Luz Gate would persist.
Water Resources	No impacts to groundwater. Impacts from erosion and offsite sedimentation would be negligible. No impacts on floodplains with airfield improvements, the Main Gate, or the La Luz Gate.	Same as described in Alternative 1.	Same as described in Alternative 1.	No impacts on water resources.

Table 2-3. Comparison of Potential Environmental Consequences of the Alternatives by Resource

Resource	Alternative 1 (Airfield, Main Gate, La Luz Gate)	Alternative 2 La Luz Gate	Alternative 3 La Luz Gate	No Action Alternative
Geological Resources	<u>Geology</u> Airfield – no impacts. Main Gate/La Luz Gate – long-term negligible adverse impacts. <u>Topography</u> Airfield/Main Gate/La Luz Gate – long-term, negligible adverse impacts. <u>Soils</u> Airfield/Main Gate/La Luz Gate – short-term, minor adverse impacts.	Same as described in Alternative 1.	Same as described in Alternative 1.	No impacts on geology, topography, and soils.
HAZMAT and Wastes, Contaminated Sites, and Toxic Substances	Short-term minor adverse impacts on hazardous materials and toxic substances. No impacts to the Environmental Restoration Program. Short-term minor adverse impacts from toxic hazards.	Same as described in Alternative 1.	Same as described in Alternative 1.	No impacts to hazardous materials and wastes.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This EA analyzes potential impacts on existing environmental conditions associated with airfield improvements and the repositioning of the Main Gate and La Luz Gate at Holloman AFB, New Mexico. The analysis considers the current, baseline conditions of the affected environment and compares them to conditions that might occur should the Air Force implement either of the Proposed Action Alternatives or the No Action Alternative.

Section 3.1 provides a justification for those resources eliminated from analysis is provided. **Section 3.2** defines project resource evaluation criteria and the geographic scope of potential consequences, or the region of influence (ROI), is identified. Lastly, **Sections 3.3** to **3.11** describe the existing conditions and discuss potential effects, reasonably foreseeable future impacts, and other environmental considerations for each resource presented by location.

3.1 Resource Areas Eliminated From Analysis

Several resources were considered relative to the Proposed Action but not carried forward for analysis. These include resources whose baseline conditions lacked a relationship to, and any potential to be altered by, implementation of the Proposed Action.

3.1.1 Airspace Management

Airspace management is not addressed in this EA because none of the proposed activities would result in a change to current airspace uses, flight activities, or training, and no changes to current aircraft operations would occur. As a result, the Air Force anticipates no short- or long-term impacts on airspace management at Holloman AFB. Therefore, airspace management was not carried forward for detailed analysis in this EA.

3.1.2 Land Use

Land use is not addressed in this EA as none of the proposed activities would result in a change to current land use designations. Much of the land that is the subject of this EA consists of previously disturbed areas. As a result, the Air Force anticipates no short- or long-term impacts on land use at Holloman AFB. Therefore, land use was not carried forward for detailed analysis in this EA.

3.1.3 Visual Resources

Visual resources are defined as the natural and man-made physical features that give a particular landscape its character and influence the visual appeal of an area for workers, residents, and visitors. Visual resources are not addressed in this EA as none of the proposed activities would result in a net change to the characteristic features of the proposed area. Given their location on an active military installation, the visual resources of the project areas would be defined by the architecture of the current facilities and the landscaping around them, all of which are described in detail in the Holloman AFB Architectural Compatibility Plan. As all new facilities are required to adhere to the design guidelines listed in the Architectural Compatibility Plan, the visual integrity and appeal of the affected areas would be largely unaffected. As a result, the Air Force anticipates no short- or long-term impacts on visual resources at Holloman AFB. Therefore, visual resources were not carried forward for detailed analysis in this EA.

3.1.4 Infrastructure

Infrastructure consists of the physical and supportive structures (facilities, wiring, pipes, etc.) designed to ensure users have the utilities they need to operate comfortably within a given environment. For the purposes of this EA, utilities such as electricity, drinking water, sewage, and communications were not evaluated as no significant impacts are expected from any of the proposed actions.

3.1.5 Environmental Justice

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued by the President of the United States on February 11, 1994. The objectives of this EO, as it pertains to this EA, include mandating that federal agencies implement strategies to identify low-income and underserved/underrepresented populations potentially affected by proposed federal actions. Additionally, potential environmental justice issues regarding children must be addressed pursuant to EO 13405, Protection of Children from Environmental Health Risks and Safety Risks. This EO directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

Access to Holloman AFB is limited to military personnel, their families, military retirees, and assigned government and contract workers. The Proposed Action lies entirely within the borders of Holloman AFB, and potential effects fall solely on current and future installation employees and military personnel by consolidating operations and modernizing common use facilities. Therefore, disproportionate environmental or human health impacts to underserved/underrepresented populations, low-income, or child populations would not occur. This was confirmed by using the EPA's Environmental Justice Screening and Mapping Tool (USEPA, 2022).

3.1.6 Socioeconomics

Implementation of the Proposed Action would have no long-term economic or socioeconomic effects on the working populations of Otero County. As most, if not all, demolition and construction activities would be contracted to local companies, there could be a slight, short-term beneficial impact to the local economy for the duration of the Proposed Action. Upon completion of the proposed projects, operation of the new airfield segments and gates would have no impact on the socioeconomics of the region, as the number of personnel employed at Holloman AFB would not change.

3.2 Analyzed Resources and Evaluation Criteria

In this section, each resource is analyzed, and the geographic scope is identified. The expected geographic scope of potential consequences is referred to as the ROI. The ROI boundaries will vary depending on the nature of each resource. For example, the ROI for some resources, such as air quality, extends over a larger jurisdiction unique to the resource. The specific criteria for evaluating impacts and assumptions for the analyses are presented under each resource area. Evaluation criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria.

Impacts are defined in general terms and are qualified as adverse or beneficial, and as short-term or long-term. For the purposes of this EA, short-term impacts are generally considered those impacts that would have temporary effects. Long-term impacts are generally considered those impacts that would result in permanent effects.

Impacts are defined as

- major, the impact is severe or highly noticeable and considered to be significant;
- minor, the impact is localized and slight but detectable;
- moderate, the impact is readily apparent and appreciable;
- negligible, the impact is localized and not measurable or at the lowest level of detection; or
- beneficial, the impact promotes or improves the natural and human environment.

Major impacts are considered significant and receive the greatest attention in the decision-making process. The significance of an impact is assessed based on the relationship between context and intensity. Major impacts require application of a mitigation measure to achieve a less than significant impact. Moderate impacts may not meet the criteria to be classified as significant, but the degree of change is noticeable and has the potential to become significant if not effectively mitigated. Minor impacts have little to no effect on the environment and are not easily detected; impacts defined as negligible are the lowest level of detection and generally not measurable. Beneficial impacts provide desirable situations or outcomes.

Impacts and their significance, as well as the means (e.g., BMPs) for reducing potential environmental impacts are also discussed for each resource.

Reasonably foreseeable future actions that could result in a potential effect to environmental resources in conjunction with the Proposed Action are summarized in **Appendix B**.

For the alternatives analyzed, airfield improvements and the Main Gate relocation are described under Alternative 1, whereas the La Luz Gate relocation also includes Alternatives 2 and 3. If La Luz Gate Alternatives 2 or 3 are selected, the airfield improvements and Main Gate repositioning as described under Alternative 1 may also be implemented.

3.3 NOISE

3.3.1 Definition of the Resource

Noise is characterized as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise considered an irritant. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. Noise can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the source, distance between the source and the receptor, receptor sensitivity, and time of day. Potentially affected sensitive noise receptors are specific (e.g., residential areas, schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists. See **Appendix C** for further information about sound and noise.

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 A-weighted decibels (dBA) over an 8-hour period. The Air Force further limits personnel to 85 dBA over an 8-hour period to ensure hearing is protected; anything beyond this value requires hearing protection to be worn. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period (see **Table 3-1** for other examples based on OSHA standards). These standards limit instantaneous exposure, such as impact noise, to 140 A-weighted decibels. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The average day/night sound level (DNL) metric is a measure of the total community noise environment. DNL is the average A-weighted sound level over a 24-hour period, with a 10-decibel adjustment added to the environmental night levels (between 2200 and 0700 hours). This adjustment accounts for increased human sensitivity to environmental night noise events. The DNL metric was adopted by the US Department of Housing and Urban Development, Federal Aviation Administration, US Environmental Protection Agency (USEPA), and DOD as the common standard for assessing noise levels for compatibility with land use, health and human safety, and effects on wildlife.

The region of influence for noise includes all areas within 0.5 miles of the project locations identified in **Table 2-2** and shown on **Figures 2-1** through **2-5**.

Table 3-1.
Typical Sound Levels from Example Activities

Noise Level (dBA)	Common Sounds[a]	Effect	T_{Max}[b]
10	Just audible	Negligible	n/a
30	Soft whisper (15 feet)	Very quiet	n/a

Table 3-1.
Typical Sound Levels from Example Activities

Noise Level (dBA)	Common Sounds[a]	Effect	T_{Max}[b]
50	Light auto traffic (100 feet)	Quiet	n/a
60	Air conditioning unit (20 feet)	Intrusive	n/a
70	Noisy restaurant or freeway traffic	Telephone use difficult	n/a
80	Alarm clock (2 feet)	Annoying	n/a
90	Heavy truck (50 feet) or city traffic	Very annoying	8 hours
100	Garbage truck	Very annoying	2 hours
110	Pile drivers	Strained vocal effort	30 minutes
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort	7.5 minutes
140	Carrier deck jet operation	Painfully loud	28 seconds

[a] Source: USEPA, 1981
[b] Source: OSHA, 2017
n/a = not applicable; T_{Max} = maximum time of exposure prior to hearing damage

3.3.2 Affected Environment

The ambient sound environment at Holloman AFB is affected mainly by Air Force aircraft operations, automotive vehicles, and maintenance activities. **Figure 3-1** presents the existing DNL noise contours for Holloman AFB plotted in 5-decibel (dB) increments, ranging from 65 to 85 dBA DNL. Secondary sources of noise, such as industrial activities and military training, also contribute to the louder ambient sound environment along the installation flightline compared to other portions of Holloman AFB. The ambient sound environment of the remaining areas of the installation is quieter because development is less concentrated. Intermittent noises from other sources, such as live-fire weapons, also contribute to the overall ambient sound environment of Holloman AFB.

Sensitive noise receptors that could potentially be exposed to noise from installation activities are proximate to the southeastern portion of the installation, where housing and an elementary school are located. The city of Alamogordo is located several miles away and is not considered a sensitive receptor due its distance from Holloman AFB.

3.3.3 Environmental Consequences Evaluation Criteria

The level of impact from noise generated by demolition activities is largely based on the

- existing sensitive receptors (schools, residential neighborhoods, etc.); and
- distance of demolition activities to sensitive receptors.

Potential noise impacts are considered if sensitive receptors experience continuous noise exposures exceeding 65 A-weighted decibels. The ROI for this resource includes all areas within 0.5 miles of the project locations identified in **Table 2-1** and shown on **Figures 2-1 through 2-5**.

3.3.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

The construction activities associated with the Proposed Action would result in a series of both short-term and long-term negligible impacts on noise.

All construction and demolition activities proposed under this alternative would be conducted during the daytime hours of 0700 to 1700. Depending on the proximity to the ROI, use of heavy equipment could cause an increase in sound that is above the ambient level in the region. A variety of sounds are emitted from loaders, trucks, graders, and other common construction equipment. **Table 3-2** presents noise levels associated with common types of construction equipment, which can exceed the ambient sound levels by 20 to 25 dBA in an urban environment. Unobstructed sound pressure levels decrease according to the inverse square law, or approximately 6 dB for every doubling of distance from the source of noise; therefore, impacts from construction noise are typically confined to within 0.5 miles of the ROI.

Table 3-2.
Estimated Noise Levels for Common Construction Equipment

Construction Equipment	L_{max}[a] 50 ft *(dBA)*	L_{max}[b] 150 ft *(dBA)*	L_{max}[b] 300 ft *(dBA)*	L_{max}[b] 400 ft *(dBA)*	L_{max}[b] 800 ft *(dBA)*	L_{max}[b] 1,600 ft *(dBA)*	L_{max}[b] 0.5 mi *(dBA)*
Backhoe	78	68	62	60	54	48	44
Chain Saw	84	74	68	66	60	54	50
Ground Compactor	83	73	67	65	59	53	49
Concrete Mixer Truck	79	69	63	61	55	49	45
Concrete Pump Truck	81	71	65	63	57	51	47
Concrete Saw	90	80	74	72	66	60	56
Crane	81	71	65	63	57	51	47
Dozer	82	72	66	64	58	52	48
Excavator	81	71	65	63	57	51	47
Front End Loader	79	69	63	61	55	49	45
Grapple (Backhoe)	87	77	71	69	63	57	53
Impact Pile Driver	101	91	85	83	77	71	67
Jack Hammer	89	79	73	71	65	59	55
Pavement Scarifier	90	80	74	72	66	60	56
Pneumatic Tools	85	75	69	67	61	55	51
Vacuum Excavator	85	75	69	67	61	55	51

a. Measured values at L_{50} taken from the United States Department of Transportation (USDOT) Federal Highway Administration (FHWA) *Construction Noise Handbook* (USDOT 2006).
b. Derived values utilizing the inverse square law $\left\{L_{p2} = L_{p1} + 20log_{10}\left(\frac{r_1}{r_2}\right)\right\}$ and published values at $L_{p1}=L_{50}$ from the FHWA.

The proposed project areas associated with airfield improvements are located within the 65 dBA noise contours (**Figure 3-1**), so elevated noise is already expected in the region from other sources. As seen in **Table 3-3**, the nearest sensitive receptors are the Holloman Elementary School and the northeastern portion of Holloman housing, both approximately 3,200 ft from proposed construction sites. The loudest expected noise at either location would not exceed 65 dBA, which is approximately the same as the DNL noise contour for each receptor. While this may result in a minor overall increase in the noise environment, this increase would be on the order of 1-3 dB which is generally considered unnoticeable by the human ear. Upon completion of the project, the noise floor would return to normal.

Table 3-3.
Estimated Noise Levels at Nearest Sensitive Receptors – Airfield Improvements

Nearest Sensitive Receptor	Minimum Distance[1] *(feet)*	Loudest Noise Possible[2] *(dBA)*	Loudest Expected Noise[3] *(dBA)*
Holloman Elementary School	3,200	65	53
Holloman Housing (NE corner)	3,200	65	53

1. Distances were approximated and measured from the center of the work sites to the nearest boundary for each sensitive receptor.
2. All noise levels are estimated based on the values in Table 3-2. Values provided are for unobstructed noises. Further attenuation is likely due to buildings and masonry walls lying between the source and receptor.
3. Values exclude the loudest sound in Table 3-2 (Pile Driver) as this equipment is unlikely to be used during construction.

Construction activities associated with repositioning the Main Gate would result in a series of short-term, minor impacts and long-term negligible impacts on noise. The use of heavy equipment at the project site would cause an increase in sound that is notably above the ambient level in the region. As seen in **Table 3-4**, the nearest sensitive receptors are the Holloman Elementary School (3,200 ft away) and the southeastern portion of Holloman housing (200 ft away). The loudest expected noise at the nearby housing area may temporarily exceed 80 dBA during some construction activities. Upon completion of the project, the noise floor at the southeast corner of Holloman housing may remain somewhat elevated as traffic will be diverted from current conditions to approximately 200 ft from the housing.

Table 3-4.
Estimated Noise Levels at Nearest Sensitive Receptors – Repositioning of Main Gate

Nearest Sensitive Receptor	Approximate Distance[1] *(feet)*	Loudest Noise Possible[2] *(dBA)*	Loudest Expected Noise[3] *(dBA)*
Holloman Elementary School	3,200	65	53
Holloman Housing (SE corner)	200	89	81

1. Distances were approximated using Google Earth as measured from the center of the work sites to the nearest boundary for each sensitive receptor.
2. All noise levels are estimated based on the values in Table 3-2. Values provided are for unobstructed noises. Further attenuation is likely due to buildings and masonry walls lying between the source and receptor.
3. Values exclude the loudest sound in Table 3-2 (Pile Driver) as this equipment is unlikely to be used during construction.

Construction activities associated with the relocation of the La Luz Gate would result in a series of short-term, negligible impacts on noise. As previously discussed, construction and demolition activities would be conducted during the daytime hours of 0700 to 1700. While the use of heavy equipment at the project site would cause an increase in sound that is notably above the ambient level in the region, there are no sensitive receptors within several miles of the project site so no impacts from noise are expected.

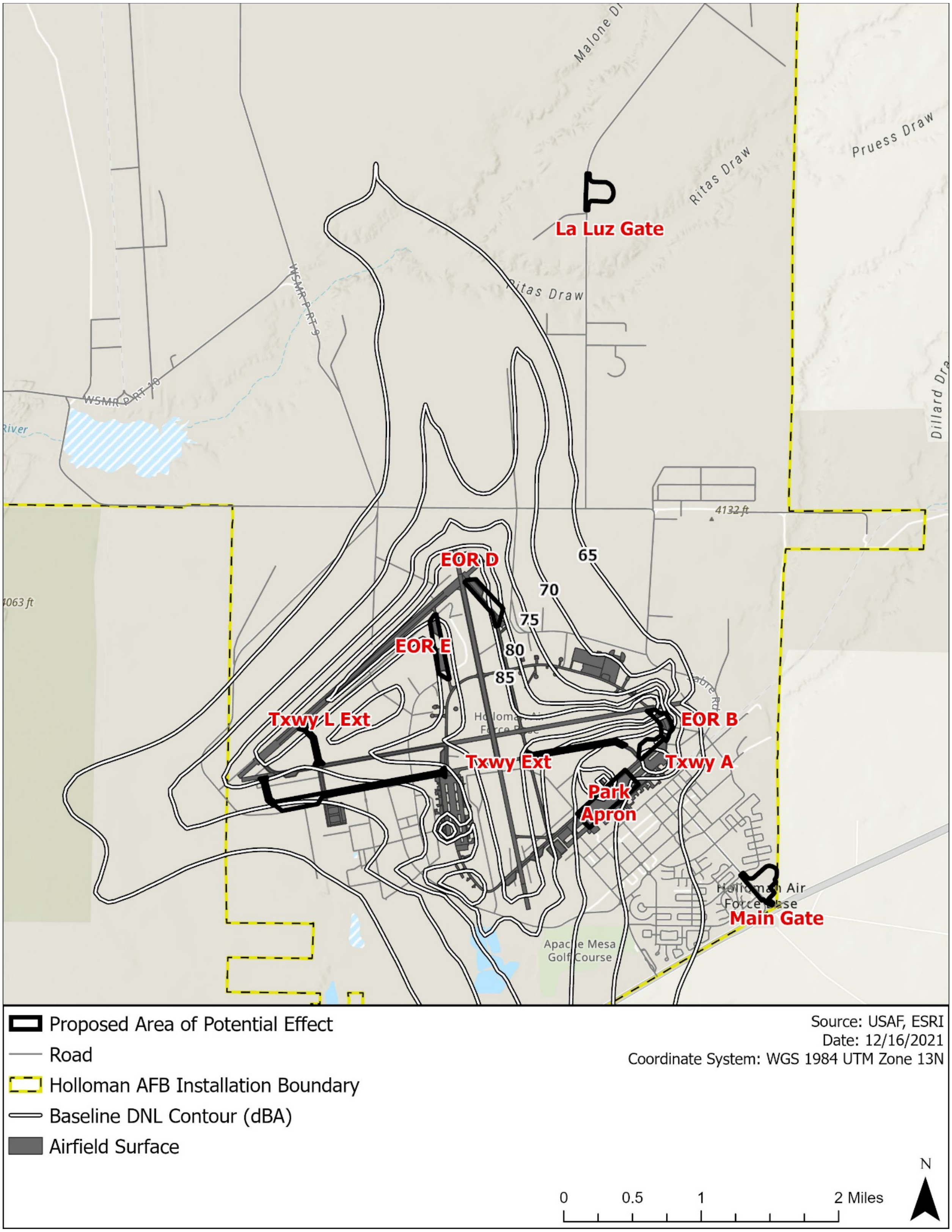


Figure 3-1. Existing Day/Night Sound Level Noise Contours at Holloman AFB

3.3.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

Noise impacts under this alternative would be the same as those discussed under Alternative 1.

3.3.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

Noise impacts under this alternative would be the same as those discussed under Alternative 1.

3.3.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed construction activities associated with the airfield and gates project would not be implemented, and the existing conditions discussed in **Section 3.3.2** would remain unchanged. No new noises would be introduced to the on- and off-installation noise environments; therefore, no impacts would occur with implementation of the No Action Alternative.

3.3.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

No reasonably foreseeable impacts to the noise environment are expected as a result of the Proposed Action or alternatives.

3.4 SAFETY

3.4.1 Definition of the Resource

Safety and health concerns associated with occupational and explosive activities are considered in this section. Occupational safety and health consider issues associated with proposed construction and demolition activities, as well as ground operations and maintenance activities that support unit operations in the vicinity of the arm/dearm pads and taxiways. Airfield safety relates to aircraft separation distances, the safe and efficient movement of aircraft, and personnel operating near areas subjected to jet blast. Explosive safety relates to the management and safe use of munitions in the vicinity of the arm/dearm pads.

Existing conditions are organized by occupational safety, airfield safety, and explosive safety. The ROI for occupational and explosive safety concerns includes the Holloman AFB airfield and areas immediately adjacent to the arm/dearm pads identified for expansion, new crew shelters, and the areas proposed for taxiway extension. The ROI for occupational safety also includes the proposed locations for the Main and La Luz Gates and the current facilities that would be demolished.

3.4.2 Affected Environment

3.4.2.1 Occupational Safety and Health

Worker safety associated with construction, renovation, and demolition activities is covered by OSHA regulations and all applicable installation safety requirements; typical construction activities do not pose a safety issue to workers provided that all applicable OSHA and Air Force safety requirements are implemented. Occupational safety and health include several categories covering ground and industrial operations, operational activities, and motor vehicle use. Ground mishaps can occur from the use of equipment or materials and maintenance functions. The purpose of the OSHA program is to protect personnel from occupational deaths, injuries, or illnesses; OSHA safety guidance published in the Department of Labor 29 series CFR governs general safety requirements relating to general industry practices (§1910), construction (§1926) and elements for federal employees (§1960). These standards include guidance for entry into areas in which a hazard may exist. Day-to-day operations and maintenance activities conducted by the 49 WG are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements identified within AFI 91-202, *The US Air Force Mishap Prevention Program*, and DAFMAN 91-203, *Air Force Occupational Safety, Fire and Health Standards*. Due to its large size, Holloman AFB has three fire stations manned during normal flight operations to ensure responders can access any portion of the airfield quickly.

3.4.2.2 Airfield Safety

Safety zones around airfields that restrict incompatible land uses are designated to reduce exposure to aircraft safety hazards. These include the clear zones (CZ), which are areas immediately beyond the ends of a runway, and accident potential zone (APZ) I and APZ II, which are areas beyond the CZs. The standards for CZs and APZs are established by DOD Instruction 4165.57, *Air Installations Compatible Use Zones*. Within the CZs, which cover a 3,000-by-3,000-ft area at the end of each runway, the overall accident risk is the highest. APZ I, which extends for 5,000 ft beyond the CZ, is an area of reduced accident potential. In APZ II, which is 7,000 ft long, accident potential is the lowest among the three zones.

Open space (undeveloped) and agricultural uses (excluding raising of livestock) are the only uses deemed compatible in a CZ. Land use within APZs is based on the concept of limiting density, and uses such as residential development, educational facilities, and medical facilities are considered incompatible and are strongly discouraged. At Holloman AFB, there is no incompatible land use within the CZs or APZs (Holloman AFB, 2016b). The safety zones are shown in **Figure 3-2**.

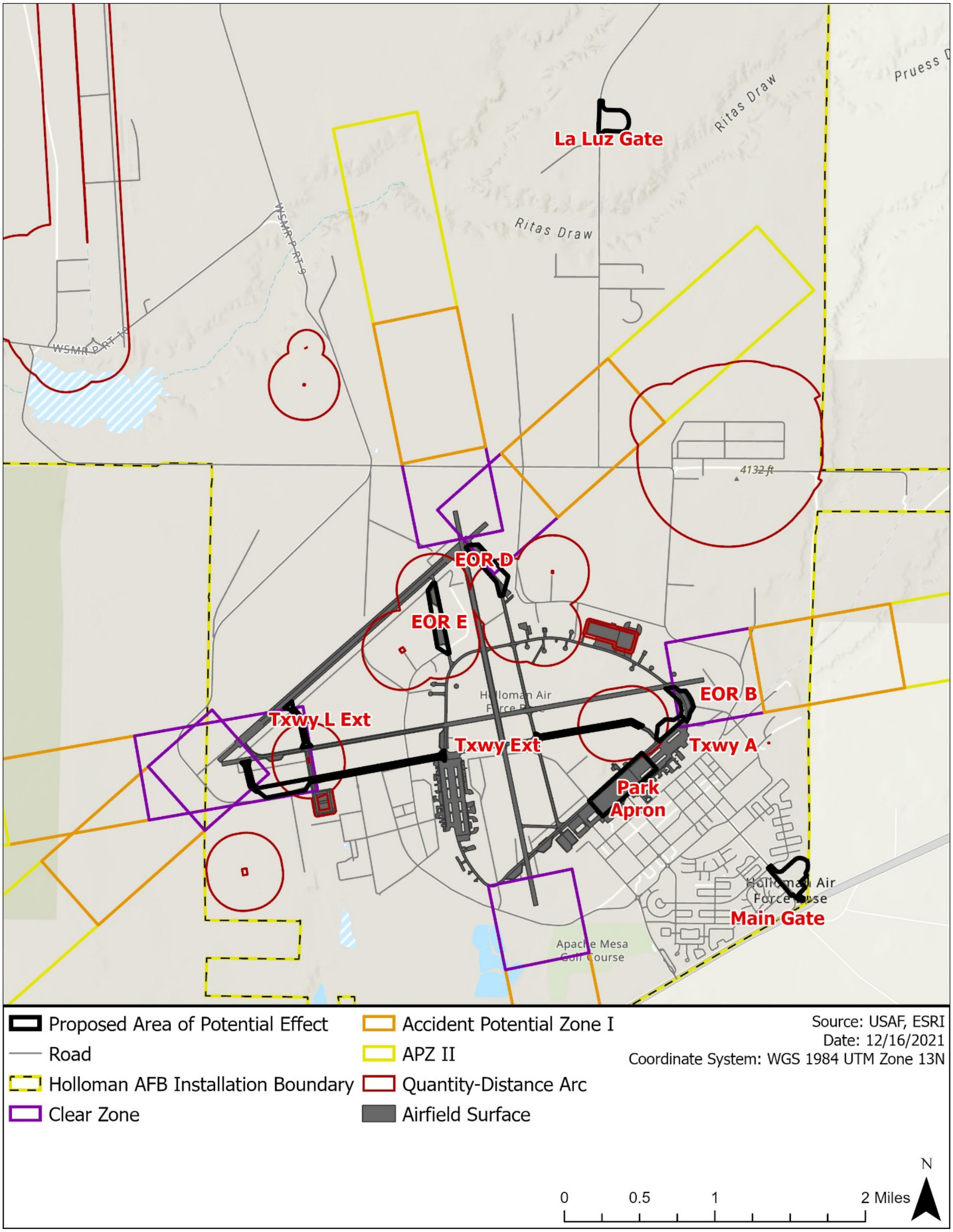
3.4.2.3 Explosive Safety

Personnel assigned to the 311th, 314th, and 8th Aircraft Maintenance Units support the flying mission of their respective Fighter Squadrons with weapons load and arm/dearm operations. The 49 WG's Munitions Flight is assigned to the 49 Maintenance Group and provides the 49 WG flying mission with munitions support, including storage, inspection, maintenance, and accountability as well as delivery and pick-up of aircraft munitions to and from the airfield. Aircraft munitions include ammunition, propellants (solid and liquid), pyrotechnics, warheads, explosive devices, and chemical agent substances and associated components that present real or potential hazards to life, property, or the environment. DESR6055.09_AFMAN 91-201, *Explosives Safety Standards*, defines the guidance and procedures dealing with munition storage and handling.

During typical training operations, aircraft are not loaded with high-explosive ordnance. Training munitions usually include captive air-to-air training missiles, countermeasure chaff and flares, 20-millimeter cannon ammunition with inert training projectiles, and training bombs with spotting charges (BDU-33). All munitions are loaded and unloaded on the aircraft parking ramp and stored and maintained in the munitions storage area. Occasionally, live bombs and 20-millimeter ammunition containing high explosives may be used for training activities. Locations and facilities where munitions are stored and handled are sited for the allowable types and amounts of explosives. All storage and handling of munitions is carried out by trained and qualified munitions systems personnel and in accordance with Air Force-approved technical orders.

Defined distances are maintained between munitions storage and handling areas and a variety of other types of facilities. The Quantity-Distance (Q-D) safety arcs are determined by the type and quantity of explosive material to be stored. The aircraft parking ramps, arm/dearm pads, and combat aircraft parking areas have associated Q-D arcs. Each explosive material storage or handling facility has Q-D arcs extending outward from its sides and corners for a prescribed distance. Within these Q-D arcs, development is either restricted or prohibited altogether to ensure personnel safety and to minimize potential for damage to other facilities in the event of an accident. The Q-D arcs on Holloman AFB are shown on **Figure 3-2**.

1



2 **Figure 3-2. Safety Zones and Quantity-Distance Arcs on Holloman AFB, New Mexico**

3.4.3 Environmental Consequences Evaluation Criteria

Impacts from implementation of the Proposed Action are assessed according to their potential to increase or decrease safety and health risks to personnel, the public, property, or the environment. Impacts on safety might include airfield or gate location changes that result in greater safety risk or constructing new facilities within CZs, APZs, or Q-D safety arcs. For the purposes of this EA, an impact is considered significant if the proposed safety measures are not consistent with AFOSH and OSHA standards or violate the requirements of AFMAN 91-201 resulting in unacceptable safety risks.

3.4.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

3.4.4.1 Occupational Safety and Health

Under Alternatives 1, 2, and 3, the number of F-16 arm/dearm positions at Taxiway A and EORs B, D, and E would be expanded, new crew shelters would be constructed, and Taxiways I and J would be extended (see **Figure 2-1**). Degraded pavement on the arm/dearm pads would be removed and replaced. In addition, the Main Gate would be repositioned, and the number of identification check lanes would be increased. Subsequently, the existing facilities and unnecessary traffic lanes would be demolished. Under Alternative 1, the La Luz Gate would be moved between 2.5 and 3 miles southwest of its current location with additional identification check lanes, and the facilities at the current location would be demolished.

The actions associated with proposed construction and demolition activities from the implementation of all alternatives would not impact health and safety. Construction and demolition activities have associated inherent risks from chemical (e.g., asbestos, lead, hazardous materials [HAZMAT]) and physical (e.g., noise propagation, falling, electrocution, collisions with equipment) sources. Companies and individuals contracted to perform construction activities on Air Force installations are responsible for adhering to OSHA requirements to mitigate these hazards. Industrial hygiene programs address exposure to HAZMAT, use of personal protective equipment, and the availability and use of safety data sheets, the latter of which are also the responsibility of construction contractors to provide to workers. Federal civilian and military personnel that must enter areas under construction should be familiar with and adhere to OSHA and AFOSH requirements, as well as applicable industrial hygiene programs. Individuals tasked to operate and maintain equipment, such as power generators, are responsible for following all applicable technical guidance, as well as adhering to established OSHA and Air Force safety guidelines.

During construction activities and rerouting of traffic lanes to the new Main Gate, traffic flow may be disrupted. This may create short-term, adverse impacts on safety due to the potential to slow traffic and increase congestion on Highway 70W, thus increasing the possibility of traffic accidents. Potential negative impacts would be mitigated using signage and markings to control traffic flow in construction areas in accordance with the US Department of Transportation *Manual on Uniform Traffic Control Devices* and New Mexico statutes that govern construction zones and traffic control (66-7-303.1). Possible impacts would be resolved once construction and demolition activities are concluded. Upon completion of the Main Gate relocation under the three action alternatives, there would be long-term improvement to safety by improving the flow of traffic entering the base during peak hours and reducing the backup of traffic onto US 70.

Repositioning of the La Luz Gate under Alternative 1 may temporarily disrupt traffic flow on La Luz Gate Road and create minor, short-term impacts to safety by increasing congestion at the gate and the potential for accidents. Like the repositioning of the Main Gate, these impacts would be mitigated through adherence to the US Department of Transportation *Manual on Uniform Traffic Control Devices* and New Mexico statutes. Upon completion of the La Luz Gate relocation under Alternative 1, there would be long-term improvements to safety due to the reduction in response time of first responders to the La luz Gate in the event of an emergency.

3.4.4.2 Airfield Safety

Under Alternative 1, the expanded arm/dearm pads and the taxiway extensions would be designed in accordance with AFI 32-1023, *Designing and Constructing Military Construction Projects* and UFC 3-260-

01, *Airfield and Heliport Planning and Design*. Moreover, operations would continue to meet the safety guidelines outlined in AFI 91-202. The improvements to the airfield are expected to enhance safety by improving aircraft movements on the airfield, increasing aircraft separation on the arm/dearm pads, meeting the idle jet blast criteria in UFC 3-260-01, and improving ground operations.

3.4.4.3 Explosive Safety

There would be no impacts to explosive safety under Alternative 1. The expansion of the arm/dearm pads and taxiway extension would have no impact on munitions support activities. In addition, if the expanded arm/dearm pads and extended taxiways require alterations of existing Q-D arcs (see **Figure 3-2**), changes would be accomplished by the 49 Wing Safety to ensure compliance with the requirements specified in DESR6055.09_AFMAN 91-201. The relocation of the Main Gate and La Luz Gate would not impact existing Q-D arcs.

3.4.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

Under Alternative 2, the La Luz Gate would remain at its current location, but traffic would be rerouted to improve flow and additional identification check lanes would be added. The current facilities would be renovated. The potential impacts to occupational safety and health and explosive safety from the improvements of the La Luz Gate would be the same as those described for the La Luz Gate under Alternative 1.

3.4.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

Under Alternative 3, the La Luz Gate would be permanently closed to daily traffic and the existing La Luz Gate pavement and facilities would be demolished. The potential impacts to occupational safety and health and explosive safety from the demolition of existing facilities at the La Luz Gate would be the same as those described for the La Luz Gate under Alternative 1.

3.4.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed airfield improvement would not be implemented and the current arm/dearm pads and airfield configuration would remain. The challenges to safety, operational, and training efficiencies discussed in **Section 3.4.2** would be unchanged. Additionally, the Main and La Luz Gates would remain in their current locations and configuration. Under the No Action Alternative, the gates would not meet AT/FP standards and traffic backups at the Main Gate during peak travel would continue, as well as increased response times by first responders to the La Luz Gate.

3.4.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

Implementation of Alternatives 1, 2, or 3, in addition to reasonably foreseeable future actions at Holloman AFB, would follow existing safety procedures and policies for occupational, airfield, and explosive safety. Safety zones would not change under any alternatives. Contracted construction personnel would follow all applicable AFOSH and OSHA requirements at Holloman AFB. As such, no reasonably foreseeable effects on occupational, airfield, and explosive safety are expected with the implementation of the alternatives.

3.5 AIR QUALITY

3.5.1 Definition of the Resource

Air quality is defined by the concentration of various pollutants in the atmosphere at a given location. Under the Clean Air Act (CAA), the six pollutants defining air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter (measured less than or equal to 10 microns in diameter [PM_{10}] and less than or equal to 2.5 microns in diameter [$PM_{2.5}$]), and lead. CO, SO_2, and some particulates are emitted directly into the atmosphere from emissions sources. NO_2, O_3, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compounds (VOCs) and nitrogen oxides (NO_x) emissions are used to represent O_3 generation because they are precursors of O_3. Sulfur oxides (SO_x) are used to represent SO_2 emissions.

The USEPA has established National Ambient Air Quality Standards (NAAQS) (40 CFR § 50) for criteria pollutants. NAAQS are classified as primary or secondary. Primary standards protect against health effects, and secondary standards protect against welfare effects, such as damage to farm crops, vegetation, and buildings. Some pollutants have short-term and long-term standards. Short-term standards are designed to protect against acute health effects, while long-term standards were established to protect against chronic health effects. The state of New Mexico has established its own ambient air quality standards for criteria pollutants, which in some cases are more stringent than the NAAQS.

Areas that are and have been historically in compliance with the NAAQS or have not been evaluated for NAAQS compliance are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. The maintenance designation can be removed from an area if the area demonstrates to the USEPA it can consistently remain below NAAQS for more than 20 years.

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called de minimis levels. De minimis levels (in tons per year) vary by pollutant and depend on the severity of the nonattainment status for the air quality management area in question.

The New Mexico Environment Department (NMED) Air Quality Bureau oversees programs for permitting the construction and operation of new or modified stationary source air emissions in the state of New Mexico. The NMED Air Quality Bureau has delegated authority over air quality in Bernalillo County to the Albuquerque Environmental Health Department-Air Quality Division.

Climate Change and Greenhouse Gases. Global climate change refers to long-term fluctuations in temperature, precipitation, wind, sea level, and other elements of Earth’s climate system. The ways in which the Earth’s climate system is influenced by changes in the concentrations of various gases in the atmosphere have been discussed worldwide. Of particular interest, greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from both natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century because of an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences worldwide.

The ROI for air quality includes Holloman AFB and the neighboring communities within Air Quality Control Region 153.

3.5.2 Affected Environment

Holloman AFB is located in Otero County, which is in attainment for all criteria pollutants. Holloman AFB manages a Major Title V Permit that includes operating or emissions limits to ensure compliance with the CAA. This also covers most of the permitted stationary emission sources on the installation. These sources include emergency generators, fire pump engines, boilers, water heaters, fuel storage tanks and fuel dispensing systems, gasoline service stations, surface coating operations, aircraft engine testing, fire training, remediation activities, miscellaneous chemical usage, and open detonation of munitions for military training. Holloman AFB is considered a major stationary source as defined by Title V of the CAA, and potential emissions of all criteria pollutants should not exceed the 250 ton per year major source threshold. Holloman AFB is also considered a synthetic minor source of Hazardous Air Pollutants under Title I, Section 112 of the CAA.

Otero County is designated by the USEPA as unclassified/in-attainment for all criteria pollutants. Therefore, the Federal General Conformity Rule does not apply for all alternatives and no conformity analysis is required. Fugitive dust emissions would be significantly reduced with BMPs such as watering during ground-disturbing activities, using soil stabilization agents for dust suppression, and decreasing speed limits on unpaved roads for all construction projects.

Climate Change and Greenhouse Gases. Ongoing global climate change has the potential to increase average temperatures and cause more frequent, intense, and prolonged droughts in the southwest United States, including New Mexico (Garfin, et al., 2014). These variations in regional climate patterns could result in changes to flooding frequency, vegetation types, vegetation growth rates, wildfire potential, groundwater depth, and potable water availability.

3.5.3 Environmental Consequences Evaluation Criteria

The potential air quality emissions generated by demolition activities are largely based on the

- existing emissions;
- attainment status of the region in which the emissions would be released;
- presence of controls and BMPs (e.g., spraying water to reduce airborne particulate matter); and
- individual or cumulative total emissions that exceed any Federal, state, or local regulations.

The impacts to air quality resources are considered if individual or cumulative total emissions exceed any federal, state, or local regulations.

3.5.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

3.5.4.1 Airfield

The Airfield Improvements Alternative 1 would result in a short-term impact on air quality, primarily associated with site grading operations. Emissions of criteria pollutants and greenhouse gases (GHGs) would be directly produced from activities such as the operation of heavy equipment, heavy-duty diesel vehicles hauling debris to and from the project area, and workers commuting daily to and from the project areas in their personal vehicles. Additionally, heavy equipment moving soil and debris would produce a notable amount of particulate matter if uncontrolled. However, all such emissions would be temporary and produced only when construction activities are occurring.

The air pollutant of greatest concern is particulate matter. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of activity. Fugitive dust emissions would be produced from the ground disturbances associated with this alternative. Fugitive dust emissions associated with construction would be greatest during the site grading and would vary daily depending on the work phase, level of activity, and prevailing weather conditions. Particulate matter emissions would also be produced from the combustion of fuels in vehicles and construction equipment.

Construction activities would incorporate BMPs and environmental control measures (e.g., wetting the ground surface) to minimize fugitive particulate matter air emissions. Additionally, work vehicles are assumed to be well maintained and to use diesel particulate filters to reduce particulate matter air emissions. These BMPs and environmental control measures could reduce uncontrolled particulate matter emissions from a construction site by at least 50 percent depending upon the environmental control measures required and the potential for particulate matter air emissions. The Air Force contractor responsible for demolition and construction activities would also be obligated to use reasonably available fugitive dust control measures during any activity associated with the Proposed Alternatives.

The Air Force Air Conformity Applicability Model (ACAM) was used to estimate the annual air emissions from construction activities associated with the Airfield Improvements Alternative 1. **Table 3-5** summarizes the anticipated uncontrolled air emissions from activities by construction category. The ACAM reports are in **Appendix C**.

Table 3-5.
Estimated Air Emissions from Proposed Construction and Demolition Activities for Airfield Improvements

Activity[1]	NO_x (tons)	VOC (tons)	CO (tons)	SO_x (tons)	$PM_{2.5}$[2] (tons)	PM_{10}[2] (tons)	NH_3 (tons)	CO_2e (tons)
Taxiway A	0.774	0.145	1.016	0.0021	0.035	4.325	0.0006	209.7
EOR B	0.743	0.140	0.965	0.0020	0.033	2.554	0.0007	200.0
EOR D	0.977	0.184	1.294	0.0026	0.046	3.917	0.0009	258.4
EOR E	0.744	0.140	0.965	0.0020	0.033	2.551	0.0007	200.5
Taxiway L	3.425	0.652	4.074	0.0097	0.153	41.989	0.0026	967.7
Taxiway J	3.430	0.669	4.076	0.0097	0.154	50.751	0.0026	969.1
Building Demolition	0.260	0.042	0.392	0.0008	0.009	0.112	0.0004	76.4
Project Total:	10.353	1.973	12.781	0.029	0.463	106.197	0.009	2,881.8

1. All calculations were performed using ACAM v5.0.17b. See Appendix C for the complete report. Values are rounded.
2. PM emissions in this table are uncontrolled. Utilizing standard fugitive dust controls would reduce PM emissions by at least 50%.

Climate Change and Greenhouse Gases. Construction associated with the Airfield Improvements Alternative 1 would emit approximately 2,881.8 tons of carbon dioxide equivalent (CO_2e) during a given year. This amount of CO_2e is comparable to the GHG footprint of 347 single family homes for one year (USEPA, 2021). As such, this one-time emission of GHGs would not meaningfully contribute to the effects of global climate change. Therefore, the Airfield Improvements Alternative 1 would not be expected to result in a significant impact on climate change.

3.5.4.2 Main Gate

The Main Gate Alternative 1 would result in a short-term, minor impact on air quality, primarily associated with construction operations. Emissions of criteria pollutants and GHGs would be directly produced from activities such as the operation of heavy equipment, heavy-duty diesel vehicles hauling debris to and from the project area, and workers commuting daily to and from the project sites in their personal vehicles. Additionally, heavy equipment moving soil and debris would produce a notable amount of particulate matter if uncontrolled. However, all such emissions would be temporary and produced only when construction activities are occurring. Construction activities would incorporate BMPs and environmental control measures (e.g., wetting the ground surface) to minimize fugitive particulate matter air emissions. Additionally, work vehicles are assumed to be well maintained and to use diesel particulate filters to reduce particulate matter air emissions.

Table 3-6 summarizes the anticipated air emissions from activities by construction category. The ACAM reports are in **Appendix C**.

Table 3-6.
Estimated Air Emissions from Proposed Construction and Demolition Activities for Repositioning of the Main Gate

Activity[1]	NO_x (tons)	VOC (tons)	CO (tons)	SO_x (tons)	$PM_{2.5}$[2] (tons)	PM_{10}[2] (tons)	NH_3 (tons)	CO_2e (tons)
Construction / Demolition	1.030	0.315	1.522	0.003	0.040	7.767	0.001	341.1
Project Total:	1.030	0.315	1.522	0.003	0.040	7.767	0.001	341.1

1. All calculations were performed using ACAM v5.0.17b. See Appendix C for the complete report. Values are rounded.
2. PM emissions in this table are uncontrolled. Utilizing standard fugitive dust controls would reduce PM emissions by at least 50%.

Climate Change and Greenhouse Gases. Construction associated with the Main Gate Alternative 1 would emit approximately 341.1 tons of CO_2e during a given year. This amount of CO_2e is comparable to the GHG footprint of 41 single family homes for one year (USEPA, 2021a). As such, this one-time emission of GHGs would not meaningfully contribute to the potential effects of global climate change. Therefore, the Main Gate Alternative 1 would not be expected to result in a significant impact on climate change.

3.5.4.3 La Luz Gate

The La Luz Gate Alternative 1 would result in a short-term, minor impact on air quality, primarily associated with construction operations. Emissions of criteria pollutants and GHGs would be directly produced from activities such as the operation of heavy equipment, heavy-duty diesel vehicles hauling debris to and from the project area, and workers commuting daily to and from the project sites in their personal vehicles. Additionally, heavy equipment moving soil and debris would produce a notable amount of particulate matter if uncontrolled. However, all such emissions would be temporary in nature and produced only when construction activities are occurring. Construction activities would incorporate BMPs and environmental control measures (e.g., wetting the ground surface) to minimize fugitive particulate matter air emissions. Additionally, work vehicles are assumed to be well maintained and to use diesel particulate filters to reduce particulate matter air emissions.

Table 3-7 summarizes the anticipated air emissions from activities by construction category. The ACAM reports are in **Appendix C**.

Table 3-7.
Estimated Air Emissions from Proposed Construction and Demolition Activities for La Luz Gate Alternative 1

Activity[1]	NO_x (tons)	VOC (tons)	CO (tons)	SO_x (tons)	$PM_{2.5}$[2] (tons)	PM_{10}[2] (tons)	NH_3 (tons)	CO_2e (tons)
Construction / Demolition	0.703	0.228	1.028	0.002	0.028	1.908	0.001	226.3
Project Total:	0.703	0.228	1.028	0.002	0.028	1.908	0.001	226.3

1. All calculations were performed using ACAM v5.0.17b. See Appendix C for the complete report. Values are rounded.
2. PM emissions in this table are uncontrolled. Utilizing standard fugitive dust controls would reduce PM emissions by at least 50%.

Climate Change and Greenhouse Gases. Construction associated with the La Luz Gate Alternative 1 would emit approximately 226.3 tons of CO_2e during a given year. This amount of CO_2e is comparable to the GHG footprint of 27 single family homes for one year (USEPA, 2021). As such, this one-time emission of GHGs would not meaningfully contribute to the effects of global climate change. Therefore, the La Luz Gate Alternative 1 would not be expected to result in a significant impact on climate change.

3.5.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

The La Luz Gate Alternative 2 would result in a short-term, minor impact on air quality, primarily associated with construction operations. Emissions of criteria pollutants and GHGs would be directly produced from activities such as the operation of heavy equipment, heavy-duty diesel vehicles hauling debris to and from the project area, and workers commuting daily to and from the project sites in their personal vehicles. Additionally, heavy equipment moving soil and debris would produce a notable amount of particulate matter if uncontrolled. However, all such emissions would be temporary and produced only when construction activities are occurring. Construction activities would incorporate BMPs and environmental control measures (e.g., wetting the ground surface) to minimize fugitive particulate matter air emissions. Additionally, work vehicles are assumed to be well maintained and to use diesel particulate filters to reduce particulate matter air emissions.

Table 3-8 summarizes the anticipated air emissions from activities by construction category. The ACAM reports are in **Appendix C**.

Table 3-8.
Estimated Air Emissions from Proposed Construction and Demolition Activities for La Luz Gate Alternative 2

Activity[1]	NO_x (tons)	VOC (tons)	CO (tons)	SO_x (tons)	$PM_{2.5}$[2] (tons)	PM_{10}[2] (tons)	NH_3 (tons)	CO_2e (tons)
Renovation	0.371	0.167	0.503	0.001	0.017	1.012	0.000	100.3
Project Total:	0.371	0.167	0.503	0.001	0.017	1.012	0.000	100.3

1. All calculations were performed using ACAM v5.0.17b. See Appendix C for the complete report. Values are rounded.
2. PM emissions in this table are uncontrolled. Utilizing standard fugitive dust controls would reduce PM emissions by at least 50%.

Climate Change and Greenhouse Gases. Construction associated with the La Luz Gate Alternative 2 would emit approximately 100.3 tons of CO_2e during a given year. This amount of CO_2e is comparable to the GHG footprint of 12 single family homes for one year (USEPA, 2021). As such, this one-time emission of GHGs would not meaningfully contribute to the effects of global climate change. Therefore, the La Luz Gate Alternative 2 would not be expected to result in a significant impact on climate change.

3.5.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

The La Luz Gate Alternative 3 would result in a short-term, minor impact on air quality, primarily associated with construction operations. Emissions of criteria pollutants and GHGs would be directly produced from activities such as the operation of heavy equipment, heavy-duty diesel vehicles hauling debris to and from the project area, and workers commuting daily to and from the project sites in their personal vehicles. Additionally, heavy equipment moving soil and debris would produce a notable amount of particulate matter if uncontrolled. However, all such emissions would be temporary and produced only when construction activities are occurring. Construction activities would incorporate BMPs and environmental control measures (e.g., wetting the ground surface) to minimize fugitive particulate matter air emissions. Additionally, work vehicles are assumed to be well maintained and to use diesel particulate filters to reduce particulate matter air emissions.

Table 3-9 summarizes the anticipated air emissions from activities by construction category. The ACAM reports are in **Appendix C**.

Table 3-9.
Estimated Air Emissions from C&D Activities for La Luz Gate Alternative 3

Activity[1]	NO_x (tons)	VOC (tons)	CO (tons)	SO_x (tons)	$PM_{2.5}$[2] (tons)	PM_{10}[2] (tons)	NH_3 (tons)	CO_2e (tons)
Demolition	0.192	0.033	0.246	0.001	0.007	0.383	0.000	60.6
Project Total:	0.192	0.033	0.246	0.001	0.007	0.383	0.000	60.6

1. All calculations were performed using ACAM v5.0.17b. See Appendix C for the complete report. Values are rounded.
2. PM emissions in this table are uncontrolled. Utilizing standard fugitive dust controls would reduce PM emissions by at least 50%.

Climate Change and Greenhouse Gases. Construction associated with the La Luz Gate Alternative 3 would emit approximately 60.6 tons of CO_2e during a given year. This amount of CO_2e is comparable to the GHG footprint of 11 single family homes for one year (USEPA, 2021). As such, this one-time emission of GHGs would not meaningfully contribute to the effects of global climate change. Therefore, the La Luz Gate Alternative 3 would not be expected to result in a significant impact on climate change.

3.5.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed construction and demolition activities associated with the Airfield and Access Control Points Improvements would not be implemented and the existing conditions discussed in **Section 3.5.2** would remain unchanged. Therefore, no air quality impacts would occur with implementation of the No Action Alternative.

3.5.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

Implementation of Alternatives 1, 2, or 3, in addition to reasonably foreseeable future actions at Holloman AFB, would not result in any reasonably foreseeable effects on the region's air quality.

3.6 Biological Resources

3.6.1 Definition of the Resource

Biological resources include native or invasive plants and animals; sensitive and protected floral and faunal species; and the habitats, such as wetlands, forests, and grasslands, in which they exist. Habitat can be defined as the resources and conditions in an area that support a defined suite of organisms. Special status species include plant and animal species that are: (1) listed as endangered, threatened, or proposed for listing by the USFWS under the ESA and their designated critical habitats; (2) protected by the federal Migratory Bird Treaty Act of 1981; (3) protected under the Bald and Golden Eagle Protection Act of 1940; or (4) listed under state ESAs or similar conservation laws. The description of the primary federal statutes that form the regulatory framework for the evaluation of biological resources is provided in **Appendix C**.

The ROI for biological resources includes the areas on Holloman AFB situated on and adjacent to the locations proposed for airfield improvements and gate relocation (see **Figures 2-1 through 2-5**).

3.6.2 Affected Environment

The information presented in this section was primarily gathered from the Holloman AFB Integrated Natural Resources Management Plan (INRMP; Holloman AFB, 2018) and from the USFWS (2021) and New Mexico Department of Game and Fish (NMDGF, 2019, 2021).

Ecoregion descriptions are provided to describe the common vegetation within the ROIs. Ecoregions are used to characterize areas of similar type, quality, and quantity of environmental resources (USEPA, 2021b). Ecoregions are assigned hierarchical levels to delineate ecosystems spatially based on different planning and reporting needs. Level I is the broadest ecoregion level, dividing North America into 15 ecological regions. Level II includes 50 ecoregions, and Level III divides the continental United States into

105 ecoregions. Level IV further subdivides the Level III ecoregions (USEPA, 2021b). Level III ecoregion descriptions provide a regional perspective and are more specifically oriented for environmental monitoring, assessment and reporting, and decision-making (Commission for Environmental Cooperation, 1997).

3.6.2.1 Vegetation

The ecosystems on Holloman AFB, part of a more extensive system ranging beyond base borders, are represented by the Level III Chihuahuan Desert ecoregion (NMDGF, 2019). The Chihuahuan Desert ecoregion encompasses 26,989 mi^2 of the southern third of New Mexico and is the northern portion of a contiguous warm desert extending into central Mexico. Elevations range from 2,800 to 8,550 ft, and the terrain consists of broad basins bordered by isolated, rugged mountains. This ecoregion is arid, marked by hot summers and mild winters. There are 27 naturally vegetated habitat types, 3 unvegetated land covers, and agricultural land mostly comprised of two habitats, Chihuahuan Semi-Desert Grassland and Chihuahuan Desert Scrub (NMDGF, 2019). Holloman AFB land includes both of these upland habitats as well as dunelands (Great Plains Sand Grassland and Shrubland and Intermountain Saltbrush Shrubland), playa (Intermountain Saltbrush Shrubland), arroyo riparian (Warm Desert Arroyo Riparian Scrub), and wetlands (Holloman AFB, 2018). Except in small patches of high elevation woodlands of oak (*Quercus* spp.) and piñon-juniper above 7,050 ft, dominant plant species are blue grama (*Bouteloua gracilis*) and black grama (*Bouteloua eriopoda*), creosote (*Larrea tridentata*), American tarwort (*Flourensia cernua*), mesquite (*Prosopis* spp.), and yuccas (*Yucca* spp.). Common faunas include prairie dogs, kit foxes, pronghorn (*Antilocapra americana*), and black-tailed jackrabbits (*Lepus californicus*) (NMDGF, 2021).

Within the ROI, the undeveloped areas of Holloman AFB are dominated by xerophytic shrubland and grassland communities having plant assemblages biogeographically related to the Chihuahuan Desert and Great Basin (Holloman AFB, 2018). The cantonment area contains the greatest total number of acres and continuous extent of Alkali Sacaton Grasslands within Holloman AFB. Shrublands dominated by fourwing saltbush (*Atriplex canescens*) also cover a large portion of the cantonment area. Pickleweed Shrubland and Gyp Dropseed Grassland make up much of the remaining undeveloped plant assemblages within the cantonment area. Mixed Shrub-Grasslands north of Douglas Road are dominated by shrubland communities with extensive patches of grassland communities (Holloman AFB, 2018). Holloman AFB development, disturbance, and roads cover about eight percent of the area, with the remaining communities associated with riparian habitat within the draws or rock outcrops on Tularosa Peak.

3.6.2.2 Wildlife

Considering its relatively small size, Holloman AFB provides a large diversity of habitats for aquatic and terrestrial species (Holloman AFB, 2018). Throughout the Tularosa Basin, suitable wildlife habitat is limited, due to ranching, farming, and urban and rural development. Within this patchwork, wildlife inhabits increasingly smaller pockets of native habitat further fragmented by roads and fences. Mammals range from small bat and rodent species to medium-size carnivores and large ungulates such as pronghorn, mule deer and the nonnative gemsbok (*Oryx gazella*). Common wildlife in the area includes coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonі*), and black-tailed jackrabbit (*Lepus californicus*). Holloman AFB manages land used by at least 16 different species of bats, including the pale Townsend's big-eared bat *(Corynorhinus townsendii*) and spotted bat (*Euderma maculatum*). A 2011 bat survey using mist-nets and acoustic monitoring identified at least six different bat species on base, including the most commonly detected species, the Mexican free-tailed bat (*Tadarida brasiliensis*) (Holloman AFB, 2018).

Other mammal species observed on Holloman AFB include the Ord's kangaroo rat (*Dipodomys ordii*), desert pocket mouse (*Chaetodipus penicillatus*), plains pocket mouse (*Perognathus flavescens gypsi*), White Sands woodrat (*Neotoma micropus leucophaea*), porcupine (*Erethizon dorsatum*), coyote, kit fox (*Vulpes macrotis neomexicanus*), long-tailed weasel (*Mustela frenata*), ringtail (*Bassariscus astutus*), Rocky Mountain mule deer (*Odocoileus hemionus*), and the desert mule deer (*Odocoileus hemionus crooki*).

During previous surveys, at least 264 bird species have been inventoried on Holloman AFB and the Boles Wells Water System Annex, and 81 of these species are currently listed by at least one agency or organization as a species of concern (Holloman AFB, 2018). Some species that have been more commonly observed include waterfowl such as northern shoveler (*Anas clypeata*) and ruddy duck (*Oxyura jamaicensis*), raptors such as Swainson's hawk (*Buteo swainsoni*) and prairie falcon (*Falco mexicanus*), gamebirds like Gambel's quail (*Callipepla gambelii*) and scaled quail (*Callipepla squamata*), as well as numerous species of passerines (commonly known as song or perching birds). The western burrowing owl (*Athene cunicularia hypogea*) is a year-round resident, taking advantage of the habitat and prey found in and around the airfield and the cantonment area (Holloman AFB, 2018).

Holloman AFB manages habitat for a variety of amphibian, lizard, and snake species, and according to previous surveys, it is home to at least 3 amphibian, 11 lizard, and 9 snake species (Holloman AFB, 2018). This includes the desert massasauga (*Sistrurus tergeminus*) and Texas horned lizard (*Phrynosoma cornutum*). The mosquito fish (*Gambusia affinis*) is the most common fish species on base and was introduced by NMDGF into ditches, lagoons, and Lake Holloman to control mosquito populations.

3.6.2.3 Threatened and Endangered Species and/or Species of Concern

A list of federal listed species that may occur in the action area was obtained from the USFWS Information for Planning and Consultation (IPaC) website (USFWS, 2022) and for state listed species from New Mexico Environmental Review Tool (NMDGF, 2022, Project ID: NMERT-1913)**.** Twenty federal and/or state listed species are identified as potentially occurring on or within 1 mile of the base, of which only five species have been documented on Holloman AFB (Holloman AFB, 2018) **Table 3-10** provides a list of the species and their federal and state status.

None of the federally listed species identified in the IPaC List of Threatened and Endangered Species (Project Code: 2022-0034619) have been documented on base during natural resource surveys (Holloman AFB, 2018). While some riparian habitat is present that may be used by yellow-billed cuckoo, they have not been documented on base. The northern aplomado falcon (*Falco femoralis*) also has the potential to occur on Holloman AFB, yet numerous surveys have not documented its presence. The federal candidate monarch butterfly (*Danaus plexippus*) is found throughout New Mexico, with summer and spring breeding occurring in the southern half of the state (Xerces Society, 2022). While surveys for monarch butterflies and potential habitat have not yet occurred at Holloman AFB, several species of host milkweed (*Asclepias* spp.) are present in Otero County (Xerces Society, 2019), and nectar-producing plants such as desert willow (*Chilopsis linearis*) and sunflowers (*Helianthus* spp.) are located on Holloman AFB (Xerces Society, 2016; Holloman AFB, 2018). For the remaining species listed within the IPaC as potentially being present on Holloman AFB, either the base is not within their known range, suitable habitat does not occur on base, or both.

Table 3-10.
Federal and State Listed Species Identified and Documented on Holloman AFB

Species	Federal Status[1]	State Status[1]	Documented on Holloman AFB[1]
Birds			
Aplomado falcon (*Falco femoralis)*[2]		E	No
Northern aplomado falcon (*Falco femoralis septentrionalis*)[2]	NEP	E	No
Mexican spotted owl (*Strix occidentalis lucida*)	T		No
Yellow-billed Cuckoo *Coccyzus americanus*	T		No
Baird's sparrow (*Centronyx bairdii*)		T	Yes
Bald eagle (*Haliaeetus leucocephalus*)		T	Yes
Peregrine falcon (*Falco peregrinus anatum*)		T	Yes
Common blackhawk (*Buteogallus anthracinus*)		T	No
Interior least tern (*Sternula antillarum athalassos*)[2]		E	No
Bell's vireo (*Vireo bellii*)		T	No
Gray vireo (*Vireo vicinior*)		T	No
Mammals			

Table 3-10.
Federal and State Listed Species Identified and Documented on Holloman AFB

Species	Federal Status[1]	State Status[1]	Documented on Holloman AFB[1]
Peñasco least chipmunk (*Neotamias minimus atristriatus*)	PE	E	No
Spotted bat (*Euderma maculatum*)		T	No
Fish			
Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*)	C	--	No
White Sands pupfish (*Cyprinodon Tularosa*)	--	T	Yes
Insects			
Monarch butterfly (*Danaus plexippus*)	C	C	No
Plants			
Sacramento Mountains thistle (*Cirsium vinaceum*)	T	E	No
Sacramento prickly poppy (*Argemone pleiacantha* ssp. *pinnatisecta*)	E	E	No
Todsen's pennyroyal (*Hedeoma todsenii*)	E	E	No
Wright's marsh thistle (*Cirsium wrightii*)	PT	E	No

Notes:
1. Sources: USFWS, 2022; NMDGF, 2021; Holloman AFB, 2018
2. The Northern aplomado falcon is a subspecies of the Aplomado falcon. The aplomado falcon is believed to be extirpated from New Mexico.

Abbreviations: AFB = Air Force Base; C = Candidate; E = Endangered; NEP = Nonessential Experimental Population; PE = Proposed Endangered; PT = Proposed Threatened; T = Threatened

The state listed species known to occur on Holloman AFB include the Baird's sparrow (*Ammodramus bairdii*), bald eagle (*Haliaeetus leucocephalus)*, least tern (*Sternula antillarum*), peregrine falcon (*Falco peregrinus*), and White Sands pupfish (*Cyprinodon tularosa*) (Holloman AFB, 2018). Of these, the Baird's sparrow and bald eagle are documented as vagrants on Holloman AFB. Peregrine falcons occasionally use the wetlands for foraging on Holloman AFB in the summer and winter months. The White Sands pupfish is endemic to the Tularosa Basin and two translocated populations were introduced in 1970 to Lost River on Holloman AFB (**Figure 3-3**). Numerous species considered Species of Greatest Conservation Need also occur on Holloman AFB, and while these species are not listed under the ESA or the New Mexico Wildlife Conservation Act, Holloman AFB does survey and manage for them, including the western burrowing owl (an S3 vulnerable species) that has been documented within shrubland found within and north of the cantonment area, and the snowy plover (an S3 vulnerable species) documented in the wetlands on the southwest area of the base (**Figure 3-3**).

3.6.2.4 Invasive Species

Saltcedar (*Tamarix* spp.) is a concern in wetland areas at Holloman AFB where it has been planted in the past as a wind break and for dune stabilization (Holloman AFB, 2018). Five-horn smotherweed (*Bassia hyssopifolia*) is native to Europe and Asia, has a high salinity tolerance, and has become invasive at Lagoon G and Ponds 3 and 4. Other invasive plant species such as African rue (*Peganum harmala*) and Russian thistle (*Salsola kali*) are common in grasslands on Holloman AFB and degrade habitat for native wildlife species. On the airfield, saltcedar and African rue are of primary concern, and they are regularly controlled by mechanical and chemical treatment. Saltcedar within the rest of the cantonment and the northern base is also controlled with mechanical treatment and herbicide.

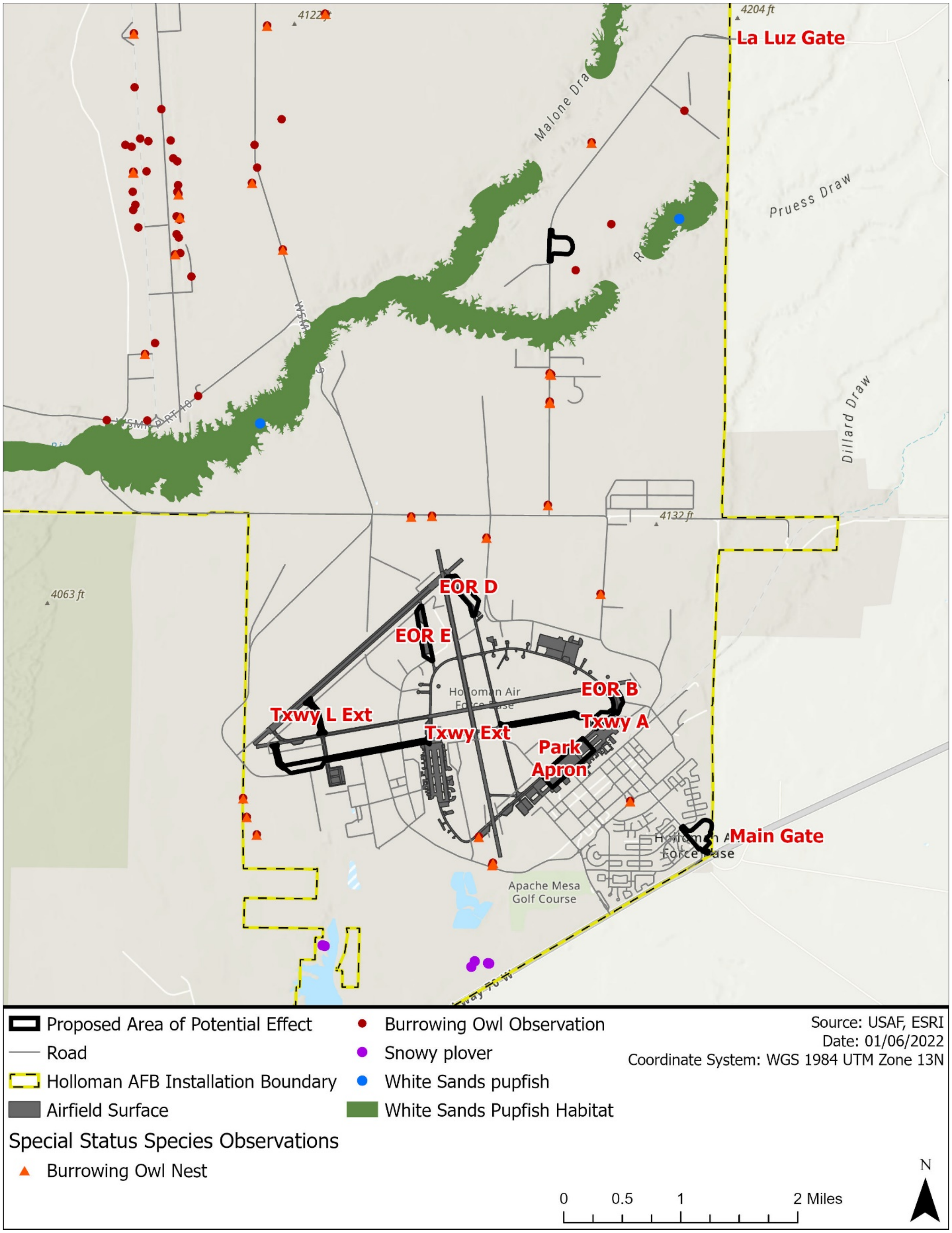


Figure 3-3. Documented Locations of Western Burrowing Owl, White Sands Pupfish, and Snowy Plover on Holloman AFB

3.6.3 Environmental Consequences Evaluation Criteria

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

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

Impacts on biological resources occur if species or habitats of high concern are negatively affected over relatively large areas. Impacts are also considered if disturbances cause reductions in the population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation ensuring that agency actions do not affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid "taking" federally threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a federal agency action.

3.6.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

3.6.4.1 Vegetation

Under Alternative 1, airfield improvements would require ground-disturbing activities of an estimated 110 ac of land within the airfield and an estimated 5.1 ac of land for the Main Gate relocation (see **Table 2-2** and **Figures 2-1 through 2-3**). The cantonment area, which includes the airfield and Main Gate, are the most disturbed areas on the base (Holloman AFB, 2018). The vegetation within the airfield and cantonment is primarily shrubland dominated by sparse fourwing saltbush, associated with highly disturbed areas, and some alkali sacaton shrubland. The proposed relocation of the La Luz Gate would disrupt an estimated 3.1 ac of previously undisturbed fourwing saltbush shrubland/alkaline sacaton grassland vegetation (see **Figures 2-4 and 2-5**).

During construction activities, soil surfaces, including existing vegetation, would be cleared, graded, trenched, and leveled for the construction of expanded ramps and taxiways on the airfield and the new Main Gate traffic lanes, parking, and facilities. During construction on airfield ramps and taxiways, degraded or unnecessary pavement would be removed or replaced. Upon completion of the new Main Gate and La Luz Gate facilities, an estimated 2.8 ac and 0.8 ac, respectively, of obsolete gate facilities and unnecessary roads and parking areas would be demolished. After demolition, the area would be landscaped using xeriscaping techniques that are designed to eliminate or reduce the need for irrigation, as well as drought-tolerant native plants adapted to the region's climate that would provide long-term, beneficial impacts.

Prior to the start of construction, the contractor would be required to implement pre-construction BMPs and obtain permits to limit the displacement of native plants. The vegetation on the airfield and Main Gate is previously disturbed and maintained, and the development of this land would not have significant impacts on vegetation. Moreover, the net loss of previously undisturbed native vegetation from the construction of the La Luz Gate would be minor. As such, there would be long-term, minor impacts to native vegetation from construction activities.

3.6.4.2 Wildlife

Potential impacts to wildlife would occur from the short-term presence of heavy equipment and noise associated with construction activities. The potential short-term impacts would not jeopardize the continued existence of a species or result in an overall decrease in population diversity, abundance, or fitness.

Construction activities under the Proposed Action and Alternatives include potential short-term direct and indirect impacts to wildlife. Direct impacts include possible interactions with machinery or destruction of nests or burrows containing eggs or young. Indirect impacts include habitat loss or disturbance from noise and human activity from land clearing and construction preparation. Projects in the airfield area and Main Gate area are less likely to disturb wildlife due to existing continuous disturbances associated with activities in these areas. More wildlife may be present in the less disturbed location proposed for the La Luz Gate, but conservation efforts would minimize effects. Most of the wildlife species found on base are common and well adapted to rural or semi-urban settings, and some of these species may return following project construction. Some species may avoid project sites long term; however, the affected areas are small and the habitat marginal. While some mortality of wildlife may occur, any loss would be minor and would not result in long-term impacts to wildlife populations. Conservation BMPs to minimize direct and indirect impacts for ground nesting birds include conducting ground-disturbing construction outside the primary nesting season of 1 March through 1 July. When project activities cannot occur outside the bird nesting season, a survey would be conducted by a qualified biologist, prior to scheduled activity, to determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are detected, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling birds. Potential impacts to wildlife and habitat from implementation of the Proposed Action or Alternatives are expected to be short-term and minor.

3.6.4.3 Threatened and Endangered Species

As discussed above, the proposed construction on the airfield and at the Main Gate would occur at locations that experience regular disturbances and therefore do not provide optimal habitat for the federal listed species regularly documented on Holloman AFB. In addition, the northern aplomado falcon has not been documented on Holloman AFB. Therefore, these species would not be affected by the implementation of Alternative 1. While the monarch butterfly has the potential to occur on Holloman AFB, the amount of undisturbed vegetation that would be removed under the Alternative 1 relocation of the La Luz Gate would be minor, comprising only about 0.02 percent of the grassland community north of Douglas Road. Any potential impacts would be negligible. Natural resource surveys have not documented the remaining federally listed species on Holloman AFB (Holloman AFB, 2018). The Air Force has made a *no effect* determination for the Mexican spotted owl, yellow-billed cuckoo, Peñasco least chipmunk, Rio Grande cutthroat trout, Sacramento Mountains thistle, Sacramento prickly poppy, Todsen's pennyroyal, and Wright's marsh thistle from implementation of Alternative 1. The Air Force has made a *may affect, but not likely to adversely affect* determination for the federal candidate monarch butterfly at Holloman AFB from the implementation of Alternative 1.

The minimal amount of undisturbed habitat that would be removed from the relocation of the La Luz Gate would not affect the Baird’s sparrow, bald eagle, or peregrine falcon, which may use this habitat for foraging, since they are either vagrant or occasional visitors on Holloman AFB. These species would not be affected by the airfield improvements and relocations of the Main Gate and La Luz Gate under Alternative 1.

Habitat and documented locations for the state listed White Sands pupfish are located within a quarter mile of the proposed site for the La Luz Gate (see **Figure 3-3**). Prior to construction activities, the contractor would be required to comply with the Holloman AFB Storm Water Pollution Prevention Plan (SWPPP) and the Master Sediment Control Plan, which includes complying with regulatory requirements, coordinating construction BMPs to minimize storm water contamination, and adherence to BMPs for storm water management as related to construction activities (Holloman AFB, 2005). To ensure adherence to the SWPPP, the 49 CES Environmental Flight is required to inspect all temporary construction sites. Prior to the start of construction, sediment traps, sediment basins, storm drain inlet and outlet protection, and other appropriate standard construction practices would be implemented to control stormwater runoff and soil erosion from the site. There would be no impact on the White Sands pupfish from the implementation of Alternative 1.

Western burrowing owls or active nests may be present near the locations proposed for airfield improvements or the Main Gate and La Luz Gate relocations. As discussed in the Wildlife section above, conservation BMPs would be implemented to minimize direct and indirect impacts. If necessary, the 49 CES Environmental Flight may relocate burrows away from the locations proposed for construction activities. Potential impacts on burrowing owls and habitat from implementation of the Proposed Action or Alternatives are expected to be short-term and minor.

Conservation BMPs to minimize direct and indirect impacts for ground nesting birds include conducting the proposed action outside the primary nesting season (identified as 1 March through 1 July). When project activities cannot occur outside the bird nesting season, a survey conducted by a qualified biologist prior to the scheduled activity would determine if active bird nests or breeding behaviors are detected within the area of impact. If nesting birds are present, vegetation removal activities would be delayed until nestlings have fledged, or the nest fails, or breeding behaviors are no longer observed. If the activity must occur, active nests would be properly buffered to avoid take of adults, eggs, and nestling birds.

3.6.4.4 Invasive Species

As described in the Vegetation analysis, there would be activities that disturb vegetation in the airfield, Main Gate, and La Luz Gate ROIs. Upon completion of the construction activities, the area would be landscaped using xeriscaping techniques designed to eliminate or reduce the need for irrigation, as well as drought-tolerant native plants adapted to the region’s climate to stabilize the soil. Affected areas would be maintained to help prevent nonnative, invasive plant growth, which would provide long-term, beneficial impacts. BMPs would help prevent the spread of invasive plants and would include removing vegetation and soils from any equipment used in areas with invasive plants. There would be no impacts on invasive species control from the implementation of Alternative 1.

3.6.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

3.6.5.1 Vegetation

Under Alternative 2, additional access lanes and identification check lanes would be installed at the current La Luz Gate, and the current facilities would be renovated. Under this alternative, an estimated 132,509 square feet of additional pavement for roadway would be added. The additional pavement would require the removal of an estimated three ac of previously disturbed land and may also impact some previously undisturbed fourwing saltbush shrubland/alkaline sacaton grassland vegetation. The amount of native vegetation removed from the additional roadway pavement would be minimal and result in long-term, minor impacts to native vegetation from construction activities.

3.6.5.2 Wildlife

The potential impacts to wildlife from the renovation of the La Luz Gate would be similar to those described under Alternative 1, although less land would be disturbed. The same conservation BMPs described under Alternative 1 would be implemented under Alternative 2 for the La Luz Gate. Potential impacts on wildlife are expected to be short-term and minor.

3.6.5.3 Threatened and Endangered Species

The addition of traffic lanes and renovation of the existing La Luz Gate facilities under Alternative 2 would have no impact on federal or state listed species. While the western burrowing owl may be present near the existing La Luz Gate, the same BMPs described for Alternative 1 would be applied to minimize impacts. Potential impacts to burrowing owls and habitat from the implementation of Alternative 2 are expected to be short-term and minor.

3.6.5.4 Invasive Species

The potential impacts to invasive species from the addition of traffic lanes and renovation of existing La Luz Gate facilities under Alternative 2 and the actions to minimize impacts would be the same as those described under Alternative 1. There would be no impacts on invasive species control from the implementation of Alternative 2.

3.6.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

3.6.6.1 Vegetation

Under Alternative 3, an estimated 0.8 ac of existing La Luz Gate pavement and facilities would be demolished. Upon completion of demolition activities, the area would be landscaped using xeriscaping techniques designed to eliminate or reduce the need for irrigation, as well as drought-tolerant native plants adapted to the region's climate to stabilize the soil. Affected areas would provide long-term, beneficial impacts.

3.6.6.2 Wildlife

The removal of the existing La Luz Gate facilities and the subsequent landscape actions described above would provide additional habitat for wildlife. The small amount of additional land that would be converted from improved to vegetated habitat would have long-term, minor beneficial impacts on wildlife.

3.6.6.3 Threatened and Endangered Species

The removal of existing La Luz Gate facilities under Alternative 3 would have no impact on federal or state listed species. As discussed for Wildlife above, the conversion of land from improved to natural habitat may increase habitat for the western burrowing owl and result in long-term, minor beneficial impacts.

3.6.6.4 Invasive Species

Under Alternative 3, some traffic lanes and the existing La Luz Gate facilities would be demolished. After completion of demolition activities, the area would be landscaped using xeriscaping techniques designed to eliminate or reduce the need for irrigation, as well as drought-tolerant native plants adapted to the region's climate to stabilize the soil. Affected areas would be maintained to help prevent nonnative, invasive plant growth that would provide long-term, beneficial impacts. There would be no impacts on invasive species control from the implementation of Alternative 3.

3.6.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed airfield improvement would not be implemented, the arm/dearm pads and airfield geometry would remain as currently configured, and the Main and La Luz Gates would stay in their current locations and configuration. As such, there would be no impact on biological resources.

3.6.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

The alternatives, in addition to the reasonably foreseeable future actions summarized in **Appendix B**, would result in long-term, negligible to minor impacts on biological resources. There are no impacts on threatened and endangered species on Holloman AFB, when taken in conjunction with reasonably foreseeable future actions. No significant reasonably foreseeable effects on biological resources would be expected from the proposed construction, demolition, and renovation projects.

3.7 CULTURAL RESOURCES

3.7.1 Definition of the Resource

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and EOs.

Cultural resources include the following subcategories:

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

A historic property is defined in 36 CFR § 800.16 as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register of Historic Places (NRHP). To be eligible for the NRHP, historic properties must be 50 years old and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance and meet at least one of four criteria (National Park Service, 2002):

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

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

Federal laws protecting cultural resources include the Archaeological and Historic Preservation Act of 1960, as amended, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the NHPA, as amended through 2016, and associated regulations (36 CFR Part 800). The NHPA requires federal agencies to consider the effects of federal undertakings on historic properties prior to making a decision or taking an action and to integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the Section 106 consultation process, as set forth in 36 CFR Part 800. Section 106 of the NHPA also requires agencies to consult with federally recognized Indian tribes with a vested interest in the undertaking.

Section 106 of the NHPA requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects on historic properties (36 CFR § 800.1[a]). For cultural resource analysis, the Area of Potential Effects (APE) is used as the ROI. APE is defined as the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist,” (36 CFR § 800.16[d]) and thereby diminish their historic integrity.

3.7.2 Affected Environment

Holloman AFB is located in the Tularosa Basin of south-central New Mexico, approximately 7 mi southwest of Alamogordo. The Main Cantonment covers 51,813 ac. Holloman AFB is bounded by White Sands Missile Range (WSMR) to the north, south, and west and by White Sands National Park to the south. Private, state, and Bureau of Land Management lands lie to the east of Holloman AFB.

The APE, as defined for analyzing historic properties in this EA, includes the locations proposed for alteration (i.e., increased pavement at EORs, additional taxiways, and proposed gate locations) and areas in which excess and degraded pavement would be demolished. A 50-foot construction buffer is also included in the APE (**Figure 3-4 through 3-7**). Per 36 CFR 800.4, *Identification of Historic Properties,* Holloman AFB determined the scope of identification efforts in consultation with the New Mexico (NM) SHPO as well as Tribal Historic Preservation Officers (THPO) and other Tribal representatives of the Mescalero Apache, Fort Sill Apache Tribe, Ysleta del Sur Pueblo, and the Pueblo of Zuni. The NM SHPO concurred with the cultural resources APE and historic inventory. See **Appendix A** for feedback from THPOs and other Tribal representatives.

3.7.2.1 Archaeological and Traditional Cultural Properties

Archaeological sites on Holloman AFB cover more than 10,000 years of human occupation and represent a wide range of site types including unique prehistoric "hearth mounds" as well as ranching and military-era sites. Since 1979, a total of 262 sites have been identified and recorded including 135 prehistoric sites, 24 historical sites, 50 military-era sites, 44 multicomponent sites, and 9 recent or undated sites (Holloman AFB, 2017a). Holloman AFB has 100% complete archaeological survey coverage on the main base. A total of 12 archaeological sites are located within a 0.5-mile radius of the APE. Nine of these sites have been determined ineligible for inclusion in the NRHP with SHPO concurrence. Two sites have been determined eligible for inclusion in the NRHP with SHPO concurrence, and one site is unevaluated and therefore is provided the same consideration and protections as an eligible site. **Table 3-11** identifies archaeological historic properties within the vicinity of the APE.

Table 3-11.
Areas of Cultural, Historical, and Architectural Significance Within or Adjacent to the Area of Potential Effect

LA Site Number	HAR Site Number	NRHP Determination	Within APE	Adjacent to APE	Within 0.5-mile Radius of APE
LA 115877	HAR-256	Not evaluated	No	No	Yes
LA 168660	HAR-373	Individually eligible	No	No	Yes
LA 168662	HAR-374	Individually eligible	No	Yes	Yes

Abbreviations: APE = Area of Potential Effect; HAR = Holloman Archeological Resource; LA = New Mexico Laboratory of Anthropology; NRHP = National Register of Historic Places

Site New Mexico Laboratory of Anthropology (LA) 115877/ Holloman Archeological Resource (HAR)-256 is one of 68 single component Jornada Mogollon/Formative period sites and LA 168660/HAR-373 is one of 44 multicomponent sites documented on Holloman AFB Main Base. Both are located approximately 0.25 miles south of the southernmost border of the La Luz Gate Relocation APE (**Figure 3-7**).

Site LA 168662/HAR-374 is the historic Old La Luz Road that connected La Luz to the Mesilla Valley, starting in the Territorial period and continuing into the early twentieth century. The road is currently overgrown with mesquite, fourwing saltbush, alkali sacaton, and broom snakeweed and not completely visible from the ground. It shows up clearly on aerial photographs, however, running parallel to (and south of) the modern segment of La Luz Gate Road that connects the current operating La Luz Gate to the proposed relocation spot. As recorded, the site has been impacted by wind but is in good condition and appears to be undisturbed (Zia Engineering and Environmental, 2010). Old La Luz Road is just outside the northernmost boundary of the La Luz Gate Relocation APE, where the APE crosses the modern La Luz Gate Road (see **Figure 3-7**).

The Mescalero Apache have shown consistent interest in base activities. Although consultation with the Mescalero Apache has involved visits to and tours of the base, no resulting TCPs or other significant resources have been identified. The Fort Sill Apache Tribe, Ysleta del Sur Pueblo, and the Pueblo of Zuni have asked to be notified of major actions taken on Holloman AFB by the Air Force, and access procedures and agreements have been established to facilitate this (Holloman AFB, 2017a). Tribal consultation associated with the Proposed Action is ongoing. Tribes consulted as part of this EA and copies of all associated correspondence are included in **Appendix A**.

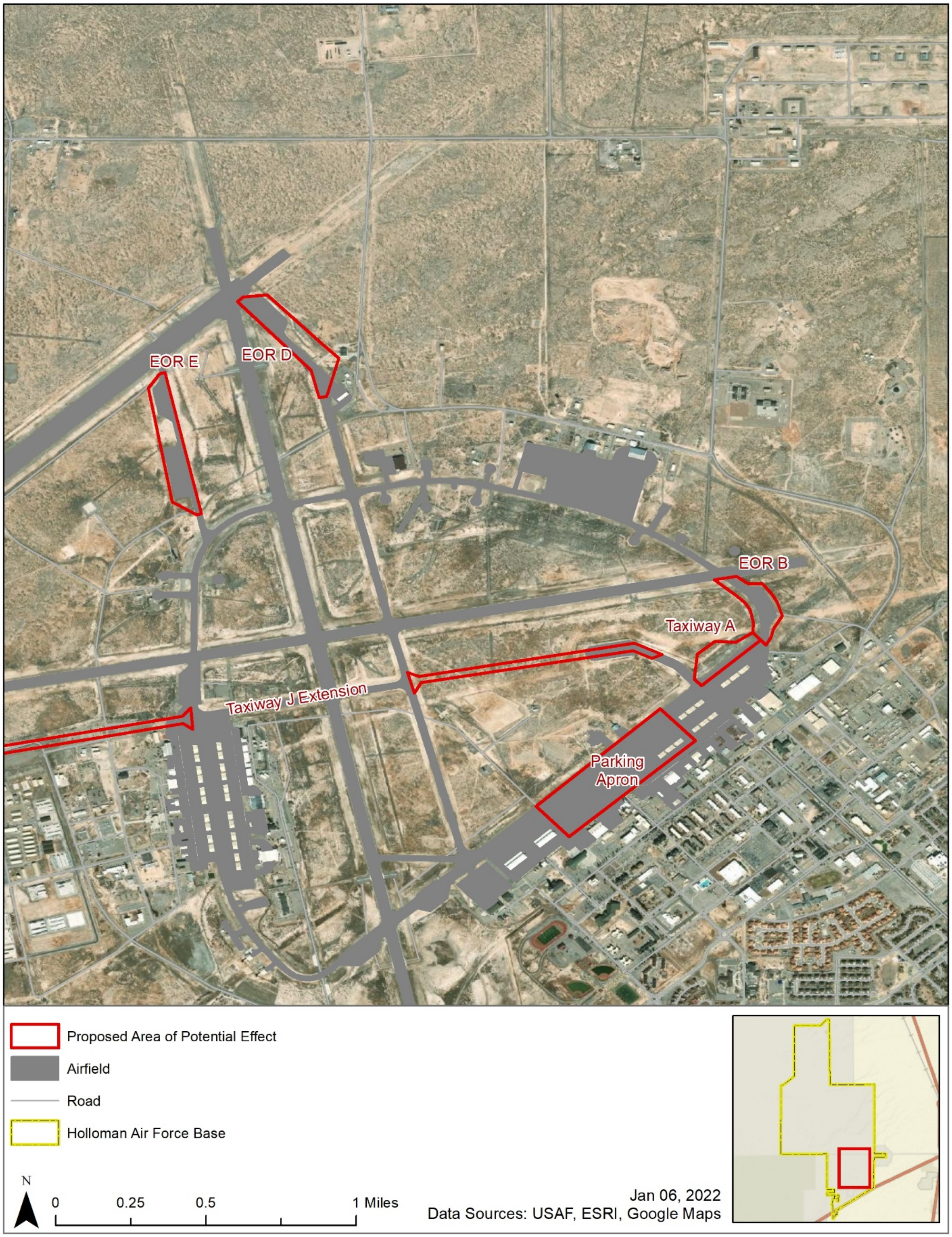


Figure 3-4. Area of Potential Effect for Airfield Improvement, East Side

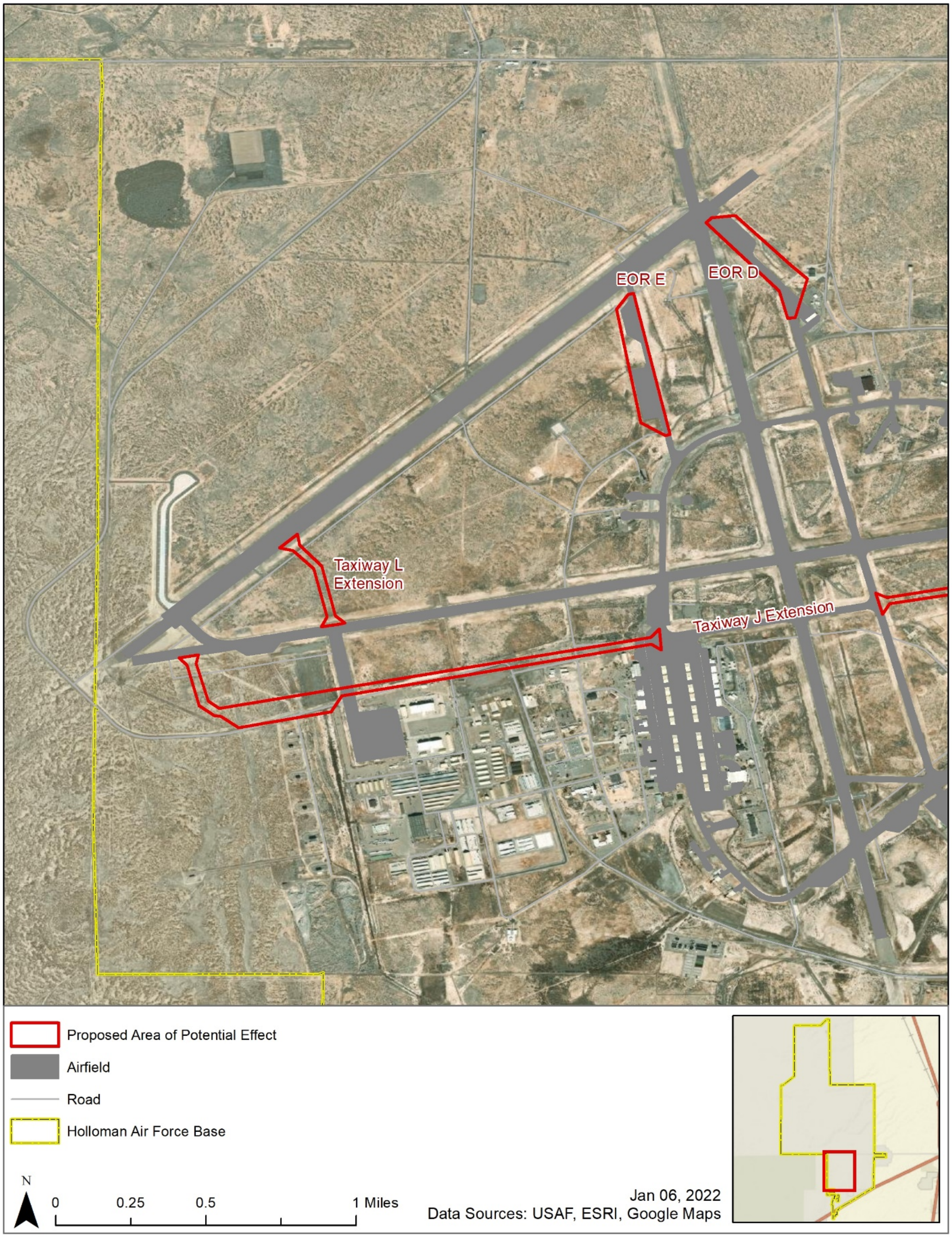
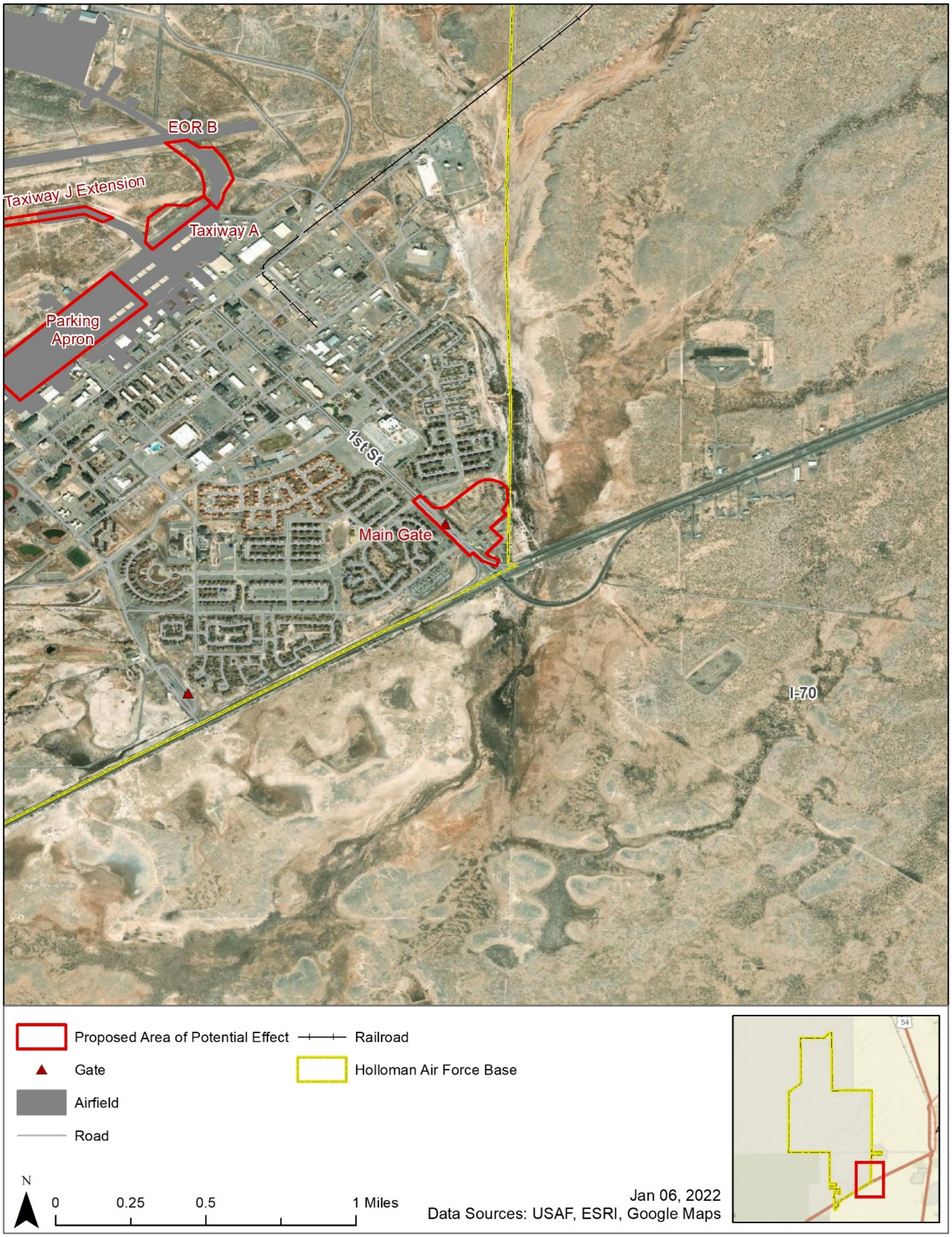


Figure 3-5. Area of Potential Effect for Airfield Improvement, West Side



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2 **Figure 3-6. Area of Potential Effect for Main Gate Repositioning**

Figure 3-7. Area of Potential Effect for La Luz Gate Relocation

3.7.2.2 Architectural Properties

There are no historic districts within the Holloman AFB Main Cantonment. The only Holloman AFB districts considered eligible for inclusion in the NRHP are the High-Speed Test Track Historic District and the Missile Test Stands Historic District—both of which are located several miles from the main cantonment area (Holloman AFB, 2017a; O'Leary, 1994). None of the architectural resources within the APE are eligible for listing on the NRHP.

3.7.3 Environmental Consequences Evaluation Criteria

Effects on cultural resources might include physically altering, damaging, or destroying all or part of a resource or altering characteristics of the resource that make it eligible for listing in the NRHP. Those effects can include introducing visual or audible elements that are out of character with the property or its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate enforceable restrictions or conditions to ensure preservation of the property's historic significance. For the purposes of this EA, an effect is considered adverse if it alters the integrity of a historic property (i.e., NRHP-listed or eligible archaeological sites or architectural resources) or if it has the potential to adversely affect TCPs and the practices associated with the property.

3.7.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

Under Alternative 1, proposed Airfield Improvements as described in **Section 2.3.1.1** and Main Gate Improvements as described in **Section 2.3.2.1** would be implemented. There are no significant archaeological sites, TCPs, or architectural resources within, adjacent to, or in the general vicinity of these locations. Therefore, per 36 CFR § 800.4, *Identification of Historic Properties,* no historic properties would be affected by proposed improvements to the airfield and Main Gate locations.

Proposed improvements for the La Luz Gate location would include construction of three identification check lanes, a new gatehouse and identification check booths, a two-vehicle inspection station, an overwatch tower or pad, and other related facilities (additional details provided in **Section 2.3.3.1**). Potential effects to the proposed area of ground disturbance, including the actual construction footprints, adjacent area where construction-related clearing and grading would occur, and a construction buffer of 50 ft around all construction were analyzed for this EA.

There are no significant TCPs or architectural resources within, adjacent to, or in the vicinity of the portion of the APE associated with the potential La Luz Gate Relocation. Archaeological sites LA 115877/HAR-256 and LA 168660/HAR-373 are located approximately 0.25 miles south of the southernmost border of the portion of the APE associated with the potential La Luz Gate Relocation. It has been determined that any construction-related activities would not diminish or otherwise impact the integrity of these sites.

Site LA 168662/HAR-374, historic Old La Luz Road, is located just outside the northernmost boundary of the La Luz Gate Relocation APE, where the APE crosses the modern La Luz Gate Road. Since the APE was defined with consideration to staging areas and construction buffers, per 36 CFR § 800.4, no historic properties would be affected by construction-related activities as planned actions would not diminish or otherwise impact the integrity of this site. Furthermore, as the site is a historic roadbed, located adjacent to a major existing roadway, the proposed gate relocation would not have the potential to directly or indirectly impact the site's location, setting, feeling, or association. See **Appendix A** for SHPO correspondence.

3.7.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

Under Alternative 2, the existing La Luz Gate would be renovated in place as described in **Section 2.3.3.2.** There are no significant archaeological sites, TCPs, or architectural resources within, adjacent to, or in the general vicinity of the portion of the APE associated with the current location of the La Luz Gate. Therefore, per 36 CFR § 800.4, no historic properties would be affected by implementation of Alternative 2. See **Appendix A** for SHPO correspondence.

3.7.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

Under Alternative 3, the existing La Luz Gate would be permanently closed, and the current facilities would be demolished as described in **Section 2.3.3.3.** Potential effects for the implementation of Alternative 3 would be the same for historic properties as Alternative 2. See **Appendix A** for SHPO correspondence.

3.7.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed airfield improvement projects would not occur, the Main Gate would not be repositioned with the construction of new and additional facilities, and the La Luz Gate would remain in its current location with its existing configuration and facilities. There would be no potential to adversely affect historic properties.

3.7.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

The Proposed Action and alternatives, in addition to reasonably foreseeable future actions on Holloman AFB, are not anticipated to result in incremental or cumulative effects to historic properties, including archaeological sites, TCPs, or architectural resources.

3.8 TRANSPORTATION

3.8.1 Definition of the Resource

Transportation resources includes all means of travel including, but not limited to, streets for vehicles and bicycles, sidewalks for walking, and any means of aircraft movement on the ground. This resource also includes any means of controlling the flow of transportation, such as stop lights, crosswalk placement, and signage. Local municipalities determine their own need for streets and roads while the New Mexico Department of Transportation oversees state and Federal highways.

The ROI for transportation includes the areas on Holloman AFB located on and adjacent to the locations proposed for airfield improvements and gate relocation (see **Figures 2-1 through 2-5**).

3.8.2 Affected Environment

3.8.2.1 Transportation – Airfield

Holloman AFB features three runways (04/22, 07/25, and 16/34) that are commonly used for military training. Additionally, Holloman currently has 23 EOR arm/dearm pads for staging F-16s. The F-16 is one of the primary aircraft that operates out of Holloman AFB and typically uses Runway 16/34 when weather conditions permit. However, frequent windy weather mandates the use of Runway 07/25 instead, creating delays and congestion when returning to the West Ramp.

3.8.2.2 Transportation – Roads

There are currently three gated entrances to Holloman AFB: the Main Gate (at the southeast corner of the installation), the West Gate (at the southwestern side of the base), which is configured for inspecting and accepting large vehicles and heavy equipment, and the La Luz Gate (at the northeast corner of the base). The location of each gate is shown in **Figure 1-1**.

The Main Gate features up to three lanes for base access, which can be increased by stationing extra security personnel per lane to perform identification checks. Even with all lanes open, the Main Gate undergoes significant congestion during the morning hours (0600-0900), which often backs traffic up onto the westbound lanes of Highway 70. This in turn creates a hazardous environment for drivers as they approach stopped or slowed traffic at high speeds, resulting in frequent accidents. According to a recent study by the 49th Security Forces Squadron (49 SFS), the main gate processes approximately 58 percent of all outbound traffic, or around 1200 vehicles per day (**Table 3-12)**. Inbound traffic is likely of similar volume.

Table 3-12.
49 Security Forces Squadron Outbound Traffic Study

Gate	Outbound Traffic (10-day average)	Percent of Total Outbound Traffic
Main Gate	1178	58%
West Gate	655	32%
La Luz Gate	213	10%

The La Luz Gate (also known as the North Gate) sees far less traffic than the Main Gate, in part because it is much smaller and more remote, being located several miles from the main base and featuring up to two lanes only. As shown in **Table 3-12**, approximately 10 percent of the total traffic count passes through the La Luz Gate. Due to its lower use and difficulty reaching the gate in a timely manner for emergency services, the gate is typically only open during peak hours – in the morning and late afternoon. Additionally, the present facilities at La Luz Gate were neither designed nor intended for full-time security personnel.

3.8.3 Environmental Consequences Evaluation Criteria

The level of impact on transportation is based on the:

- (All) Amount of congestion experienced on roads/runways, as measured by wait time to arrive at a given destination.
- (Airfield) Number of sorties prevented from flying due to congestion.
- (Main Gate) Number of cars backed up onto Highway 70, if any.
- (Gates) Response time for emergency responders to arrive at the gate.

3.8.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

3.8.4.1 Transportation – Airfield

Several improvements are proposed under this alternative, resulting in a total construction of 3.23 million square feet of parking pavement, 1.6 million square feet of shoulder asphalt, and demolition of 900,000 square feet of existing pavement. Also included is the demolition of several excess/degraded facilities that exist within the project areas. Individual improvements are shown in **Table 2-2** and **Figure 2-1** and are assessed below.

- Increasing arming positions from 23 to 48 by enlarging those existing areas at Taxiway A and EORs B, D, and E would expand staging for F-16 aircraft.
- Extending Taxiway L would connect Runways 07-25 and 04-22, creating a shortcut so returning aircraft would not need to taxi to the end of the runways to return to the West Ramp, effectively reducing congestion.
- Extending Taxiway J to nearly the full length of Runway 07-25 would allow aircraft to taxi between the West Ramp and the parking apron while Runway 07-25 is in use, creating a more efficient airfield.

Once completed, this alternative would have a major long-term beneficial impact on airfield efficiency, ensuring that Holloman AFB meets both current and future needs of the Air Force.

3.8.4.2 Transportation – Roads

Under this alternative, the existing Main Gate, Visitor's Center, and excess pavement would be demolished, and new facilities and roads would be constructed. Improvements would include an access control point featuring four identification check lanes. Shifting the road would provide more room for traffic to exit from Highway 70, increasing the efficiency of processing vehicles and decreasing the likelihood of accidents. A new Visitor's Center, guardhouse, vehicle inspection building with two vehicle inspection bays, and an overwatch tower or pad would also be constructed (see **Figures 2-2 and 2-3**). See **Table 2-2** for specific details regarding construction and demolition. With all improvements considered, there would be a net beneficial impact on transportation resources given the increased efficiency and enhanced safety of processing traffic.

Under this alternative, the existing La Luz Gate would be demolished, and a new gate would be constructed approximately three miles south along the same road (see **Figure 2-4**). Excess existing roads would be demolished, and the road would be reconfigured to that shown in Figure 2-5. New facilities would meet all modern gate requirements, including AT/FP standoffs. Improvements would include a guardhouse, three identification check lanes with booths, a two-lane inspection building, and an overwatch tower or pad. Once complete, the La Luz facilities would offer an efficient alternative to using the Main Gate for some personnel, potentially reducing traffic at other gates and resulting in a minor long-term beneficial impact on transportation resources.

3.8.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

Under this alternative, the existing La Luz Gate would be renovated to bring it to modern standards. In addition to renovations of existing facilities, this alternative may include construction of new roadway pavement to adhere to AT/FP requirements. To use the renovated facility, 49 SFS personnel would still need to pre-position at the gate to ensure an adequate emergency response time. Traffic efficiency at the gate may increase if two lanes could be used simultaneously, resulting in a negligible beneficial impact on transportation resources.

3.8.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

Under this alternative, the existing La Luz Gate would be demolished, and the gate would be permanently closed. A new security gate would be constructed at the base boundary (fence line) to ensure the road could still be used during emergencies. Personnel that normally use the La Luz Gate would be diverted to the Main and/or West Gate, potentially causing additional congestion and resulting in a minor impact on transportation resources.

3.8.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed construction and demolition activities associated with the Holloman AFB airfield and gates projects would not be implemented and the existing conditions discussed in **Section 3.8.2** would remain unchanged. Therefore, no new impacts on infrastructure would occur with implementation of the No Action Alternative. Sorties that rely on existing ramps and taxiways would continue to operate under suboptimal, congested conditions with inefficient workarounds to implement their mission. Traffic concerns would continue to be an issue at the Main Gate, and emergency services would still need to pre-position to ensure adequate response time to the La Luz Gate.

3.8.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

The alternatives, in addition to the reasonably foreseeable future actions summarized in **Appendix B**, would result in long-term improvements to transportation. No significant reasonably foreseeable effects on transportation would be expected from the proposed construction, demolition, and renovation projects.

3.9 WATER RESOURCES

3.9.1 Definition of the Resource

Water resources are natural and man-made sources of water that are available for use by, and for the benefit of, humans and the environment. Water resources relevant to Holloman AFB's location in New Mexico include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes and ensures compliance with the Clean Water Act, 33 U.S.C. §1251 et seq. (1972).

Groundwater exists in the saturated zone beneath the Earth's surface that collects and flows through aquifers. Groundwater is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial purposes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. The state of New Mexico passed ground and surface water protection objectives subject to the Water Quality Act, New Mexico Statutes Annotated 74-6, under 20.6.2 New Mexico Administrative Code. Groundwater quality and quantity are regulated under several federal and state programs.

Surface water includes natural, modified, and man-made water confinement and conveyance features above groundwater that may or may not have a defined channel and discernable water flow. These features are generally classified as streams, springs, wetlands, natural and artificial impoundments (e.g., ponds, lakes), and constructed drainage canals and ditches.

Floodplains are areas of low, level ground along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation from rain or melting snow. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and provision of habitat for a diversity of plants and animals. Flood potential is evaluated by the Federal Emergency Management Agency, which defines the 100-year floodplain as an area within which there is a one percent chance of inundation by a flood event in a given year, or a flood event in the area once every 100 years. The risk of flooding is influenced by local topography, the frequency of precipitation events, the size of the watershed above the floodplain, and upstream development. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreation and conservation activities, to reduce the risks to human health and safety. EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain and directs them to avoid floodplains to the maximum extent possible whenever there is a practicable alternative.

The ROI for water resources includes the areas on Holloman AFB located on and adjacent to the locations proposed for airfield improvements and gate relocation (see **Figures 2-1 through 2-5**).

3.9.2 Affected Environment

3.9.2.1 Groundwater

Holloman AFB lies within the Tularosa Basin, a closed basin with no known outflow. Groundwater recharge is provided by summer monsoons, storm events, and snowmelt from the nearby San Andres and Sacramento Mountains, which percolate unrestricted through the earth until eventually reaching the Bolson aquifer. The Bolson aquifer is highly saline and contains high total dissolved solids, classifying it as non-potable. The only source of potable water is from several perched aquifers near mountain canyons located off-base (Holloman AFB, 2018).

3.9.2.2 Surface Water

No ponding areas and no perennially flowing surface waters are located on Holloman AFB in the project areas. There are no wetlands or jurisdictional waters as defined by the United States Army Corps of Engineers (USACE, 2015) and none regulated under Section 404 of the Clean Water Act within the project areas. There are, however, several prominent drainages on Holloman AFB which bear intermittent water flows during large rain events such as thunderstorms or monsoons. The largest of these is the Lost River drainage system north of the main installation and running roughly east-west, which splits into the Rita and Malone Draws. The Dillard Draw runs north-south along the southeastern portion of the installation boundary.

3.9.2.3 Floodplains

Floodplains are typically low-lying areas that are subject to inundation during significant rainfall events. The floodplain for Holloman AFB is primarily associated with the Lost River drainage system and several other draws that cross the base. As seen in **Figure 3-8**, the proposed construction site for La Luz Gate Alternative 1 is located between the floodplains of the Rita and Malone Draws. According to the Federal Emergency Management Agency, the draw furthest to the southeast (Dillard Draw) is associated with the 100-year floodplain and is adjacent to the proposed construction site for the Main Gate Alternative 1. There are no floodplains associated with the proposed construction under Airfield Improvements Alternative 1.

3.9.3 Environmental Consequences Evaluation Criteria

The level of impact on water resources is based on the:

- Location of the ROI relative to floodplains;
- Location of the ROI relative to surface water or ponding areas; and
- Use of groundwater during construction and post-construction steady-state usage.

3.9.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

3.9.4.1 Groundwater

This project would have no appreciable effect on daily water use at Holloman AFB. While the aquifer underlying the installation is non-potable and not regulated, BMPs would be implemented under the stormwater permit (see Section 3.9.4.2) to control runoff and ensure no direct access to groundwater recharge points. This would also decrease sediment transportation that could be transferred to groundwater resources or drainage ditches and minimize contamination. With best practices and planning during construction and demolition activities, there would be no impacts on groundwater resources.

3.9.4.2 Surface Water

There are no notable drainage or ponding regions within the project area. Much of the area is level or near level, and minimal runoff occurs during rain events. Most water is readily absorbed into the soils or quickly evaporates in the desert heat. Since more than one acre would be disturbed by this alternative, a National Pollutant Discharge Elimination System (NPDES) stormwater permit would be required. Additionally, construction activities would be governed by a SWPPP, which would outline the necessary steps for stormwater runoff management to reduce soil erosion and minimize the potential impact of contaminants on other water resources. For example, an SWPPP may include containment measures for heavy construction equipment leaking petroleum products. Following construction, soil stabilization efforts such as seeding or compost berms would be used to minimize future erosion. With proper implementation of a well-designed SWPPP, impacts from erosion and offsite sedimentation would be negligible.

3.9.4.3 Floodplains

There are no floodplains associated with any airfield improvements so there would be no impacts (see **Figure 3-8**). The Main Gate is adjacent to Dillard Draw, which contributes to the 100-year floodplain in the region. Since this alternative continues to utilize land adjacent to the draw, care would be taken to ensure facilities, roads, and parking lots remain outside the floodplain. Given the location of the proposed gate features relative to Dillard Draw, no impacts to floodplains are expected from the repositioning of the Main

Gate. The proposed siting location for the La Luz Gate is between floodplains associated with the Rita and Malone Draws. However, the project area itself is flat and elevated relative to the draws and falls outside their area of impact. It is expected that no impacts to floodplains would result from the relocation of the La Luz Gate.

3.9.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

3.9.5.1 Groundwater

Potential impacts to groundwater would be the same as those described under Alternative 1.

3.9.5.2 Surface Water

Potential impacts to surface water would be the same as those described under Alternative 1.

3.9.5.3 Floodplains

There are no floodplains associated with the existing La Luz Gate so there would be no impacts.

3.9.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

3.9.6.1 Groundwater

Potential impacts to groundwater would be the same as those described under Alternative 1.

3.9.6.2 Surface Water

Potential impacts to surface water would be the same as those described under Alternative 1.

3.9.6.3 Floodplains

There are no floodplains associated with the existing La Luz Gate so there would be no impacts.

3.9.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed construction and demolition activities associated with the Holloman AFB airfield and gates projects would not be implemented, and the existing conditions discussed in **Section 3.9.2** would remain unchanged. Therefore, no new impacts on water resources would occur with implementation of the No Action Alternative.

3.9.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

No significant reasonably foreseeable effects on water resources would be expected from the proposed construction, demolition, and renovation projects.

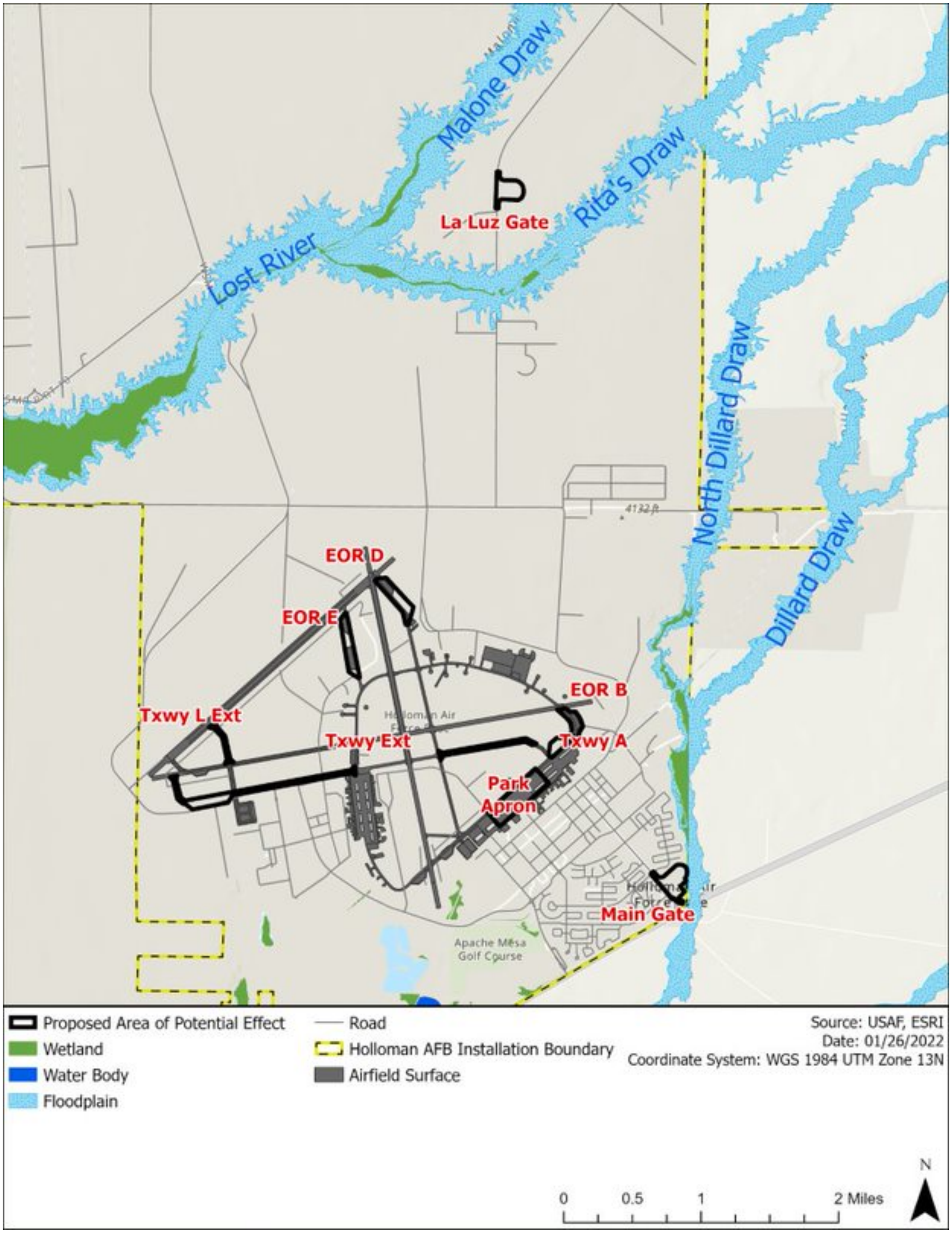

Figure 3-8. Holloman AFB Floodplain Map

3.10 Geological Resources

3.10.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards. Topography and physiography pertain to the general shape and arrangement of the land surface, including the height and position of natural and man-made features. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of structure, elasticity, strength, shrink-swell potential, and erosion potential affect the ability of a given area to support certain applications or uses. In some cases, soil properties must be assessed for their compatibility with particular construction activities or types of land use.

The ROI for geological resources includes the areas on Holloman AFB located on and adjacent to the locations proposed for airfield improvements and gate relocation (see **Figures 2-1 through 2-5**).

3.10.2 Affected Environment

3.10.2.1 Regional Geology

The Rio Grande Rift is a zone of faults and sediment-filled basins extending from south-central Colorado across New Mexico and into northern Mexico. The rift is a defining physiographic feature of central New Mexico and laid the foundation for the Tularosa Valley during the Paleozoic era. The valley filled with sediment from the surrounding mountains: San Andres Mountains to the west, Chupadero Mesa and the New Mexico highlands to the north, Sierra Blanca, Carrizo, and Sacramento Mountains to the east, and Organ Mountains to the southwest. Much of the sediment accrual consists of soils containing high levels of calcium carbonate and sulfate, making it a poor agricultural substrate.

3.10.2.2 Topography and Soils

Project area soils primarily consist of varieties of Holloman-Gypsum land-Yesum complex. Specific soil types potentially found at Holloman AFB are shown in **Figure 3-9.** (USDA-NRCS, 2021; Holloman AFB, 2018).

3.10.3 Environmental Consequences Evaluation Criteria

The level of impact on geological resources is based on the:

- Depth of constructed features potentially impacting the bedrock;
- Changes to topography from construction activities; and
- Type of soil(s) constructed features would be built upon.

Figure 3-9. Soils found on Holloman AFB

3.10.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

The proposed airfield improvements would result in long-term negligible and short-term minor impacts on geology, topography, and soil resources. All airfield projects would largely occur on previously disturbed land. Any previously occupied area would be graded to level and undergo soil stabilization measures.

The proposed repositioning of the Main Gate would result in both long- and short-term, negligible and short-term, minor impacts on geology, topography, and soil resources. As with the airfield projects, actions would largely occur on previously disturbed land and, after demolition of existing facilities, the area would be graded to level and undergo soil stabilization measures.

The proposed relocation of the La Luz Gate would result in long-term, negligible and short-term, minor impacts on geology, topography, and soil resources. Projects under this alternative would largely occur on undisturbed land. All construction areas would be graded to level and previously occupied areas would undergo soil stabilization measures.

3.10.4.1 Regional Geology

No impacts on geology would occur from airfield construction activities. Although impacts on geological features could occur, the proposed construction would not be substantial or deep enough to cause notable impacts on geological features such as those of the supporting bedrock.

Long-term, negligible impacts on geology would occur from construction and demolition activities for the repositioning of the Main Gate and the relocation of the La Luz Gate. A geotechnical investigation would be performed prior to any required excavation to determine the final design of the supporting foundation. Although impacts on geological features could occur, the proposed construction and demolition would not be substantial or deep enough to cause notable impacts on geological features such as the supporting bedrock. Short-term, negligible impacts on geology would occur from demolition activities when extracting previously placed utilities, footings, and other subsurface features.

3.10.4.2 Topography

Long-term, negligible impacts on topography would occur from construction activities associated with airfield improvements. All affected areas would be graded to level prior to construction activities. As the region already features low slopes (0-5%), this would result in little change to the topography of the ROI.

Long-term, negligible impacts on topography would occur from construction and demolition activities associated with the repositioning of the Main Gate. All affected areas were originally graded to level to support existing structures at the time of their construction; however, intermittent settling at some sites is expected. Additionally, as utilities, footings, and other subsurface features of existing structures are extracted from demolition sites, some need for backfill may be expected. After demolition activities are completed for each structure, each site will receive minor grading and backfill as necessary to return the site to the natural topography of the area. Similarly, prior to construction, the affected site would be graded to level to support the new facility.

Long-term, negligible impacts on topography would occur from construction and demolition activities associated with the relocation of the La Luz Gate. Potential siting areas have been partially disturbed from the construction of the existing road, though new disturbances would be required for supporting facilities under this alternative. However, much of the surrounding area is naturally nearly level already (0-5 percent slope) so, while some backfill may be necessary, little change would occur to the region. Upon completion of construction, any remaining open areas would be returned to the natural topography of the area.

3.10.4.3 Soils

Short-term, minor impacts on soils would occur from construction and demolition activities associated with the airfield improvement projects and the repositioning of the Main Gate and La Luz Gate largely via ground disturbance, erosion, and soil compaction. Under the Proposed Action, erosion and soil compaction would be controlled by using established protocols, such as applying water to limit airborne dust in windy environments and employing soil stabilization techniques (e.g., re-vegetating graded areas), once site construction and demolition operations are complete.

3.10.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

This alternative would result in long-term, negligible and short-term, minor impacts on geology, topography, and soil resources. All projects under this alternative would largely occur on previously disturbed land. Any previously occupied area would be graded to level and undergo soil stabilization measures.

3.10.5.1 Regional Geology

Potential impacts to regional geology would be the same as those described under Alternative 1.

3.10.5.2 Topography

Potential impacts to topography would be the same as those described under Alternative 1.

3.10.5.3 Soils

Potential impacts to soils would be the same as those described under Alternative 1.

3.10.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

This alternative would result in short-term, negligible and short-term, minor impacts on geology, topography, and soil resources. All projects under this alternative would largely occur on previously disturbed land. Any previously occupied area would be graded to level and undergo soil stabilization measures.

3.10.6.1 Regional Geology

Potential impacts to regional geology would be the same as those described under Alternative 1.

3.10.6.2 Topography

Potential impacts to topography would be the same as those described under Alternative 1.

3.10.6.3 Soils

Potential impacts to soils would be the same as those described under Alternative 1.

3.10.7 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed construction and demolition activities associated with the Holloman AFB airfield and gates projects would not be implemented, and the existing conditions discussed in **Section 3.10.2** would remain unchanged. Therefore, no new impacts on geology, topography and soils would occur with the implementation of the No Action Alternative.

3.10.8 Reasonably Foreseeable Future Actions and Other Environmental Considerations

The alternatives, in addition to the reasonably foreseeable future actions summarized in **Appendix B**, would result in long-term, negligible to minor impacts on geological resources. No significant reasonably foreseeable effects on geological resources would be expected from the proposed construction, demolition, and renovation projects.

3.11 Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances

3.11.1 Definition of the Resource

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act and the Toxic Substances Control Act, defines hazardous materials (HAZMAT) as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, an incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. OSHA is responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety under 29 CFR Part 1910. OSHA also includes the regulation of HAZMAT in the workplace and ensures appropriate training in their handling. The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, identifies the properties of hazardous waste. According to this Act, hazardous wastes include solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or, pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes, and their associated regulatory requirements are specified in 40 CFR § 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected as part of waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

The DOD developed the Environmental Restoration Program (ERP) to facilitate thorough investigations 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 and Military Munitions Response Program (MMRP) are components of the ERP. The Installation Restoration Program requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addresses non-operational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. A description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identifying properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contamination plume has been completed).

AFPD 32-70, *Environmental Quality*, and Air Force Regulation 32-7000 series incorporate the requirements of all federal regulations and other AFI and DOD Directives for the management of hazardous materials, hazardous wastes, and toxic substances.

AFPD 32-70 establishes the policy that the Air Force is committed to, including:

- Cleaning up environmental damage resulting from its past activities;
- Meeting all environmental standards applicable to its present operations;
- Planning its future activities to minimize environmental impacts;
- Responsibly managing the irreplaceable natural and cultural resources it holds in public trust; and
- Eliminating pollution from its activities wherever possible.

AFI 32-7044, *Storage Tank Compliance*, implements AFPD 32-70 and identifies compliance requirements for underground storage tanks, aboveground storage tanks (ASTs), and associated piping that store petroleum products and hazardous substances. Evaluation of HAZMAT and hazardous wastes focuses on underground storage tanks and ASTs as well as the storage, transport, and use of pesticides, fuels, oils, and lubricants. Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a Proposed Action. In addition to being a threat to humans, the improper release of HAZMAT and hazardous wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of the release of HAZMAT or hazardous wastes, the extent of contamination varies based on type of soil, topography, weather conditions, and water resources.

A toxic substance is a chemical or mixture of chemicals that may present an unreasonable risk of injury to health or the environment, but is not regulated as a contaminant under the hazardous waste statutes. These substances include asbestos-containing materials (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA regulates these special hazard substances under the Toxic Substances Control Act (15 USC § 53).

Asbestos is a mineral fiber found in rock and soil. It has been used in multiple types of building construction materials for insulation and as a fire retardant, and in a variety of manufactured goods such as roofing shingles, attic insulation, heat-resistant fabrics, automobile clutches and brakes, etc. Exposure to asbestos generally occurs during demolition work, production use, and repair/remodeling work (USEPA, 2021c). USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR § 763, with additional regulations concerning emissions at 40 CFR § 61.

Polychlorinated biphenyls are a group of man-made organic chemicals consisting of carbon, hydrogen and chlorine atoms. They were domestically manufactured from 1929 in various electrical equipment, paints, plastics, rubber products, oils, adhesives etc. until they were banned in 1979. The United States no longer produces PCBs, but exposure can still occur during maintenance and repair of older electrical instruments, transformers, caulking, heat insulation and other devices containing PCBs (USEPA, 2021d). The disposal of PCBs is addressed in 40 CFR §§ 750 and 761.

Lead can be found in paint, dust, and soil. Title V of the Toxic Substances Control Act, as well as the Residential Lead-Based Paint Reduction Act of 1992, regulates the use and disposal of LBP at federal facilities. Appropriate disposal of LBP-containing debris depends on testing of representative waste streams, typically via the toxicity characteristic leaching procedure. If toxicity characteristic leaching procedure analysis indicates that the representative debris meets the toxicity characteristic for lead, it is regulated by RCRA under 40 CFR § 261. The presence of toxic substances, as well as their locations, quantities, and conditions, assist in determining the significance of a proposed action.

AFI 32-7086, Hazardous Materials Management, establishes the procedures and standards that govern management of HAZMAT throughout the Air Force. It applies to all Air Force personnel who authorize, procure, issue, use, or dispose of HAZMAT and to those who manage, monitor, or track any of those activities.

The ROI for hazardous materials and wastes, petroleum products, toxic substances, and ERPs includes the areas on Holloman AFB located on and adjacent to the locations proposed for airfield improvements and gate relocation (**see Figures 2-1 through 2-5**).

3.11.2 Affected Environment

Holloman AFB has implemented an Environmental Management System (EMS) program in accordance with the International Organization for Standardization 14001 Standards; EO 13834, *Regarding Efficient Federal Operations*; and AFI 32-7001, *Environmental Management*. The EMS policy prescribes to protect human health, natural resources, and the environment by implementing operational controls, pollution prevention environmental action plans, and training.

All personnel, including contractors, are informed of the Holloman AFB EMS program. All project-related activities should be conducted in a manner that is consistent with relevant policy and objectives identified in the installation's EMS program. Project Managers shall ensure that all personnel are aware of the environmental impacts associated with their activities and reduce those impacts by practicing pollution prevention techniques. Installation Unit Environmental Coordinators manage and monitor the EMS requirements and advise the Project Managers of all the EMS and environmental policies.

3.11.2.1 Hazardous Materials and Wastes

Holloman AFB has one state-issued RCRA Part B permit for treatment, storage, and disposal facilities that maintains installation and hazardous management plans. The permit responsibilities include controlling the procurement and use of hazardous materials to support Air Force missions, ensuring the safety and health of personnel and surrounding communities, and minimizing Air Force dependence on hazardous materials. The Holloman AFB Installation Security Forces serve as Conservation Law Enforcement Officers by providing security for hazardous material spills and ensuring compliance with reporting requirements (Holloman AFB, 2018).

Holloman AFB maintains an inventory of ASTs under the Spill Prevention Control and Countermeasure Plan. This Plan includes the location, contents, capacity, containment measures, status, and installation dates of ASTs (Holloman AFB, 2014). Storage tanks at Holloman AFB contain jet fuel, diesel fuel, used cooking oil, used oil, and unleaded gasoline. There are 148 ASTs on Holloman AFB (Holloman AFB, 2016a). There are no underground storage tanks at Holloman AFB.

3.11.2.2 Environmental Restoration Program

Holloman AFB began its Installation Restoration Program in 1983 with the investigation of possible locations of various Areas of Concern and Solid Waste Management Units for hazardous waste contamination. The RCRA Facility Assessment was completed in 1987 (URS Group, Inc., 2015). Currently, there are 217 ERP sites identified at Holloman AFB: 181 are closed and 36 are open (Holloman AFB, 2016a). Additionally, there are 23 MMRP sites: 11 are closed and 12 are open (Holloman AFB, 2016a). None of the facilities identified for construction or renovation within the ROI are within an active ERP or MMRP site, nor have any been identified as Areas of Concern.

3.11.2.3 Toxic Substances

The 49 CES/CEIE developed the Asbestos Management Plan for Holloman AFB, which includes program administration, organizational roles and responsibilities, standard work practices, and documentation (Holloman AFB, 2017b). A complete asbestos survey was done for all Holloman AFB buildings in the early 1990s. Sampling was done in many buildings to identify locations with ACM. The 49th CE Structures Shop maintains an inventory of the ACM locations at Holloman AFB identified during the comprehensive base-wide survey (Holloman AFB, 2017b). This inventory contains information on the location, quantity, and type of ACM; however, it was not available for review. Comprehensive information or records on the presence or absence of LBP in the buildings identified for construction and renovation is not available. Holloman AFB has not developed an LBP Management Plan at this time.

3.11.3 Environmental Consequences Evaluation Criteria

Impacts on hazardous materials management would be considered if the federal action resulted in noncompliance with applicable federal, state, and local regulations or increased the amounts generated or procured beyond waste management procedures and capacities at Holloman AFB. Impacts on ERP sites would be considered if the federal action disturbed or created contaminated sites, resulting in negative effects on human health or the environment.

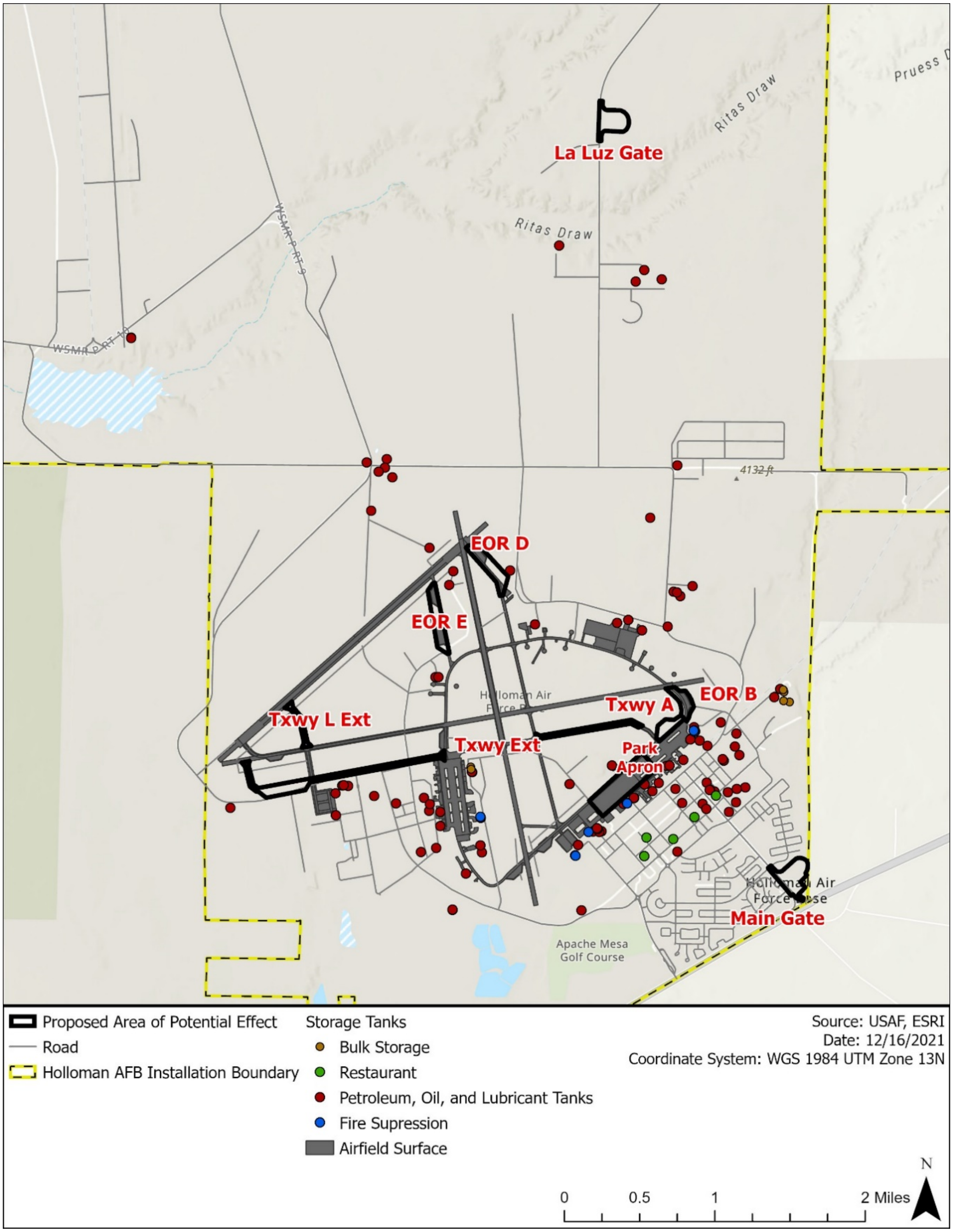

Figure 3-10. Holloman AFB Storage Tanks

3.11.4 Environmental Consequences – Alternative 1 (Airfield Improvements, Reposition Main Gate and La Luz Gate)

3.11.4.1 Hazardous Materials

Short-term, minor impacts on hazardous materials and waste would occur during construction and demolition activities associated with the Proposed Action. Both construction and demolition activities would require the use of hazardous materials (in the form of structural coatings, adhesives, solvents, welding materials, etc.) and petroleum products (fuels, lubricants, hydraulic fluids, etc.). Negligible amounts of hazardous wastes would be generated from the same processes. Construction equipment would be well maintained, and absorbent materials would be placed under the equipment to contain any possible leaks. Additional hazardous wastes would be generated in the form of debris from demolition processes. The contractors performing the work would be responsible for containing, storing, managing, and coordinating the disposal of all hazardous wastes generated during the Proposed Action. Contractors would be required to adhere to all federal, state and local regulations, including those instituted by Holloman AFB.

No long-term impacts from daily operation of the new facilities and structures would exist, as future operations would not differ significantly from those currently performed at Holloman AFB. No new hazardous materials or wastes are expected to be generated. All facilities would continue to operate in accordance with the Holloman AFB RCRA permit to manage wastes.

3.11.4.2 Environmental Restoration Program

No construction activity or soil disturbance at any ERP site would occur as the Proposed Actions are not located in any such area.

3.11.4.3 Toxic Substances

Short-term, minor impacts from toxic hazards would occur during demolition and construction processes. Surveys would be performed by certified personnel to determine the presence and extent of any hazardous materials prior to demolition. Based on exploratory survey results, plans would be created that identify the necessary controls to reduce hazards to workers and prevent the release of toxic materials from the site. Per New Mexico Administrative Code 20.11.20.22, Albuquerque Environmental Health Department-Air Quality Division would be notified if abatement of ACM is anticipated to exceed 75,000 cubic feet, although that is unlikely to happen. All hazardous debris would be disposed of at a USEPA-approved facility.

3.11.5 Environmental Consequences – Alternative 2 (La Luz Gate Renovation)

Potential impacts to hazardous materials and wastes, waste petroleum products, toxic substances, and ERPs would be the same as those described under Alternative 1.

3.11.6 Environmental Consequences – Alternative 3 (La Luz Gate Closure and Demolition)

Potential impacts to hazardous materials and wastes, waste petroleum products, toxic substances, and ERPs would be the same as those described under Alternative 1.

3.11.6.1 Environmental Consequences – No Action Alternative

Under the No Action Alternative, the proposed construction and demolition activities associated with the Alternatives Airfield and Access Control Points Improvements for Holloman AFB would not be implemented, and the existing conditions discussed in **Section 3.11.2** would remain unchanged, resulting in no impacts to hazardous materials and wastes.

3.11.6.2 Reasonably Foreseeable Future Actions and Other Environmental Considerations

The Proposed Action and alternatives, in addition to reasonably foreseeable future actions on Holloman AFB, are not anticipated to result in reasonably foreseeable effects to HAZMAT, waste, contaminated sites, and toxic substances.

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APPENDICES

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APPENDIX A
INTERGOVERNMENTAL AND STAKEHOLDER COORDINATION

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A.1 INTRODUCTION

Scoping is an early, open process for developing the breadth of issues to be addressed in an Environmental Assessment (EA) and for identifying significant concerns related to an action. Per the requirements of Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416, federal, state, and local agencies with jurisdiction that could potentially be affected by the Proposed Action or alternatives were notified during the development of this EA.

The Intergovernmental Coordination Act and EO 12372 require federal agencies to cooperate with and consider state and local views when implementing a federal proposal. Through the coordination process, potentially interested and affected government agencies, government representatives, elected officials, and interested parties that could be affected by the Proposed Action and alternatives were notified during the development of this EA. The recipient mailing list and agency and intergovernmental coordination letters and responses are included in this Appendix.

A.1.1 Agency Consultations

Implementation of the Proposed Action involves coordination with several organizations and agencies. Compliance with Section 7 of the Endangered Species Act (ESA) and implementing regulations (50 CFR Part 402) requires communication with the US Fish and Wildlife Service (USFWS) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. The primary focus of this coordination is to request a determination of whether any of these species occur in the proposal area. If any protected species is present, a determination would be made of any potential adverse effects on the species. Should no species protected by the ESA would be affected by the Proposed Action or alternatives, no additional consultation would be required. Letters were sent to the appropriate USFWS offices as well as relevant state agencies informing them of the proposal, requesting data regarding applicable protected species, and subsequently requesting concurrence with the Air Force's determination of no effect to any federally listed species.

Coordination with appropriate New Mexico state government agencies and planning districts will occur for review and comment. Compliance with Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations (36 CFR § 800) will be accomplished through the State Historic Preservation Officer. Similarly, the New Mexico Environment Department was included for air and water quality, and the New Mexico State Parks Division and the Department of Game and Fish were included in this coordination for input on habitat and species of concern.

A.1.2 Government-to-Government Consultation

The NHPA and its regulations at 36 CFR Part 800 direct federal agencies to consult with federally recognized tribes when a proposed or alternative action may affect tribal lands or properties of religious and cultural significance. Consistent with the NHPA, Department of Defense (DOD) Instruction 4710.02, *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 lands in the vicinity of the Proposed Action and alternatives have been invited to consult on all proposed undertakings that may affect properties of cultural, historical, or religious significance. The tribal consultation process is distinct from the National Environmental Policy Act consultation or the interagency coordination process, and it requires separate notifications to all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The Holloman Air Force Base (AFB) point of contact for Native American tribes is the Wing Commander. The Holloman AFB point of contact for consultation with the Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation is the Deputy Base Civil Engineer. Government-to-government consultation is included this Appendix.

A.2 PUBLIC AND AGENCY REVIEW OF THE ENVIRONMENTAL ASSESSMENT

A Notice of Availability (NOA) of the Draft EA and a Proposed Finding of No Significant Impact (FONSI) announcing the EA's availability to the public for review and comment will be published in the Alamogordo

Daily News. The public and agency review period will last a minimum of 30 days. The public and agency comments are provided in this Appendix.

Copies of the Draft EA and FONSI were also made available for review at the following locations:

- Ahrens Memorial Library, 596 West 4th Street, Holloman AFB, NM 88330
- Alamogordo Public Library, 920 Ogden Avenue, Alamogordo, NM 88310

The Air Force is aware that the ongoing coronavirus (COVID-19) pandemic may impact the usual methods of access to information and ability to communicate, such as the mass closure of local public libraries and challenges associated with an increasingly overburdened internet. The Air Force seeks to implement appropriate additional measures to ensure that the public and all interested stakeholders can participate fully in this EA process. Accordingly, please do not hesitate to contact the Holloman AFB Environmental Impact Analysis Process Program Manager directly at (575) 572-3931 to assist in resolving issues of access to the Draft EA and Proposed FONSI.

A.3 Stakeholder Mailing List

Mr. Ken Lance
Airspace Manager
White Sands Missile Range
2506 East Ridge
Alamogordo NM 88310

Director
Alamogordo City Commission
1376 East 9th Street
Alamogordo NM 88310

Brigadier General Eric D. Little
White Sands Missile Range
Building 1510
White Sands Missile Range NM 88002

Mr. Michael Espiritu
OCEDC President/CEO
Alamogordo Chamber of Commerce
1301 North White Sands Blvd.
Alamogordo NM 88310

Ms. Barbara Mick
Chair
Alamogordo Chamber of Commerce
1301 North White Sands Blvd.
Alamogordo NM 88310

Director
Cloudcroft Chamber of Commerce
P.O. Box 1291
Cloudcroft NM 88317

Commissioner Dara Dana
Chaves County
1 Saint Mary's Place
Roswell NM 88203

Commissioner Gerald Matherly
Otero County
1101 New York Avenue
Alamogordo NM 88310

Mr. Stanton L. Riggs
County Manager
Chaves County
1 Saint Mary's Place
Roswell NM 88203

Mr. Fernando R. Macias
County Manager
Dona Ana County
845 North Motel Boulevard
Las Cruces NM 88007

Ms. Pamela Heltner
County Manager
Otero County
1101 New York Avenue, Room 106
Alamogordo NM 88310

Mr. Bruce Swingle
County Manager
Sierra County
855 Van Platten Street
Truth or Consequences NM 87901

Ms. Delilah Walsh
County Manager
Socorro County
PO Box I
Socorro NM 87801

Mr. Mike Sloane
Director
NM Dept of Game and Fish
One Wildlife Way
Santa Fe NM 87507

Chairman
Dona Ana County Commissioners
845 North Motel Boulevard
Las Cruces NM 88007

Field Manager
Bureau of Land Management
Roswell Field Office
2909 West Second St.
Roswell NM 88201

Mr. Mark Matthews
Field Manager
Bureau of Land Management
Socorro Field Office
901 S. Highway 85
Socorro NM 87801-4168

Director
Las Cruces Chamber of Commerce
150 E Lohman Ave
Las Cruces NM 88001

Director
Lincoln County Commissioners
Commission Chambers, 300 Central Ave.
P.O. Box 711
Carrizozo NM 88301

Mr. Travis Moseley
Superintendent
Lincoln National Forest
3463 Las Palomas
Alamogordo NM 88310

Honorable Richard Boss
Mayor
City of Alamogordo
1376 East 9th Street
Alamogordo NM 88310

Director
Socorro County Commission
Socorro NM 87801

Honorable Chris Ventura
Mayor
Town of Carrizozo
P.O. Box 247
Carrizozo NM 88301

Honorable Ken Miyagishima
Mayor
City of Las Cruces
PO Box 20000
Las Cruces NM 88004

Honorable Dennis Kintigh
Mayor
City of Roswell
425 N. Richardson Ave.
Roswell NM 88201

Honorable Gary Williams
Mayor
City of Ruidoso Downs
103 Acequia
Ruidoso Downs NM 88346

Honorable Sandy Whitehead
Mayor
City of Truth or Consequences
505 Sims Street
Truth or Consequences NM 87901

Honorable Lynn D. Crawford
Mayor
Village of Ruidoso
313 Cree Meadows Dr.
Ruidoso NM 88345

Ms. Deborah Hartell
NEPA Support Division
White Sands Missile Range
Building 163, Springfield Street
White Sands Missile Range NM 88002

Director
New Mexico Department of Energy
490 Old Santa Fe Trail Room 400
Santa Fe NM 87501

Honorable Herrell Yvette
New Mexico Representative, District 2
U.S. House of Representatives
1305 Longworth HOB
Washington DC 20515

Honorable Ben Ray Luján
New Mexico Senator
U.S. Senate
201 N. Church Street, Suite 201B
Las Cruces NM 88001

Honorable Martin Heinrich
New Mexico Senator
U.S. Senate
201 N. Church Street, Suite 305
Las Cruces NM 88001

Mr. Ned Farquhar
NM SPOC Energy and Environmental Policy Advisor
State Capitol Building, Suite 400
Santa Fe NM 87501

Director
Otero County Commissioners
1101 New York Ave.
Alamogordo NM 88310

Ms. Jennifer Montoya
Planning and Environmental Coordinator
Bureau of Land Management
New Mexico State Office Las Cruces
District Office
1800 Marquess Street
Las Cruces NM 88005

Director
Ruidoso Valley Chamber of Commerce
720 Sudderth Dr.
Ruidoso NM 88345

Chairman
Sierra County Commissioners
855 Van Platten Street
Truth or Consequences NM 87901

Mr. Robert Houston
Chief, Special Projects (NEPA)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Ste. 1200
Dallas TX 75202

Ms. Marie Sauter
Superintendent
White Sands National Monument
P.O. Box 1086
Holloman AFB NM 88330

Dr. Jeff Pappas
State Historic Preservation Officer
NM Historic Preservation Division
407 Galisteo Street, Suite 236
Santa Fe, NM 87501

Ms. Amy Lueders
Regional Director
U.S. Fish and Wildlife Service, Southwest Region
500 Gold Avenue SW
Albuquerque, NM 87102

Chairman Lyman Guy
Apache Tribe of Oklahoma
PO Box 1330
Anadarko OK 73005

Chairman Jeff Haozous
Fort Sill Apache Tribe of Oklahoma
43187 US Highway 281
Apache OK 73006-8038

President Arthur Blazer
Mescalero Apache Tribe
PO Box 227
Mescalero NM 88340-0227

State Historic Preservation Office (SHPO) Correspondence

Michelle Lujan Grisham
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 – NM.SHPO@state.nm.us

June 23, 2022

Adam M. Kusmak, USAF
Installation Management, Chief
49th Civil Engineer Squadron
550 Tabosa Avenue
Holloman Airforce Base NM 83330

Mr. Kusmak,

The New Mexico State Historic Preservation Office has reviewed your proposed work in the Airfield East and Airfield West APEs and we concur with your assessment that no historic properties will be affected in these areas.

Please feel free to contact me at steven.moffson@state.nm.us if you have any questions.

Regards,

signed
Steven Moffson
State and National Register Coordinator

#117483

United States Fish and Wildlife Services (USFWS) Correspondence

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH WING (AETC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

31 May 2022

Adam M. Kusmak
Installation Management Chief, 49 CES
550 Tabosa Ave
Holloman AFB NM 88330

Ms. Amy Lueders
Regional Director
U.S. Fish and Wildlife Service, Southwest Region
500 Gold Avenue SW
Albuquerque, NM 87102

Dear Ms. Lueders

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations, and the Department of Defense NEPA regulations, the United States Air Force (Air Force) is preparing an Environmental Assessment (EA) to evaluate the environmental impact of three projects at Holloman Air Force Base (AFB): airfield improvements, the repositioning of the Main Gate, and the relocation or repositioning of the La Luz Gate (also known as the North Gate). 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 Proposed Action includes projects that would:

1. Expand the number of end of the runway (EOR) arm/dearm pads to increase stage, arm and launch volume; increase blast dissipation pavement; and provide shelter for EOR crews. Additionally, taxiway extensions would be constructed to improve airfield geometry. As part of the proposed taxiway extensions, several excess buildings located within and adjacent to the planned routes would be demolished.

2. Alter the configuration of the Main Gate to meet current and future Anti-Terrorism/Force Protection (AT/FP) standards, increase traffic flow, and reduce traffic congestion in the US Highway 70 deceleration lane.

3. Alter the location or configuration of the La Luz Gate to meet current and future AT/FP standards, increase traffic flow, reduce response time for Security Forces personnel, and increase safety.

The Proposed Action areas would only include land located on Holloman AFB as shown in Attachments 1 through 3. Information on the listed, proposed, and candidate species or designated or proposed critical habitat in the Proposed Action areas will be obtained from the United States Fish and Wildlife Service Environmental Conservation Online System, Information for Planning and Consultation. If you have additional information regarding potential impacts of the Proposed Actions on general or specific issues or areas of concern that should be addressed in the environmental analysis of which we may not be aware, we would appreciate receiving such information for inclusion and consideration during the NEPA compliance process.

Please respond within 30 days of receipt of this letter to ensure your concerns are adequately addressed in the EA. We intend to provide you with access to the Draft EA when the document is completed. Please inform us if someone else with your agency other than you should be notified of the availability of the Draft EA. Please send your written responses to Mr. Spencer Robison, Holloman NEPA Program Manager, 49 CES/CEIE, 550 Tabosa Ave, Holloman AFB NM 88330 or email spencer.robison@us.af.mil.

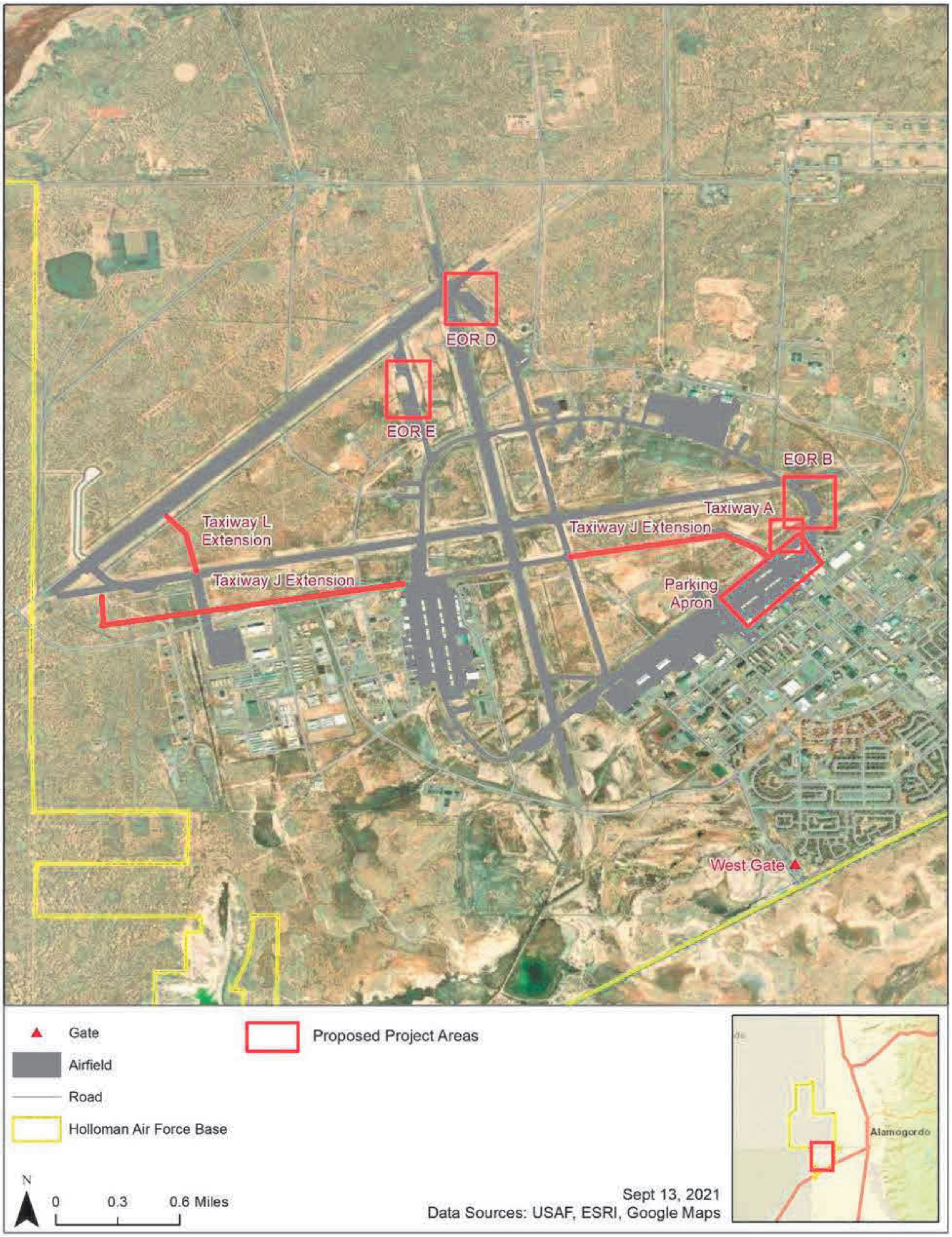
Sincerely

KUSMAK.ADAM.M.1263331806 Digitally signed by KUSMAK.ADAM.M.1263331806 Date: 2022.06.14 12:49:34 -06'00'

ADAM KUSMAK, GS-13, USAF
Installation Management Chief

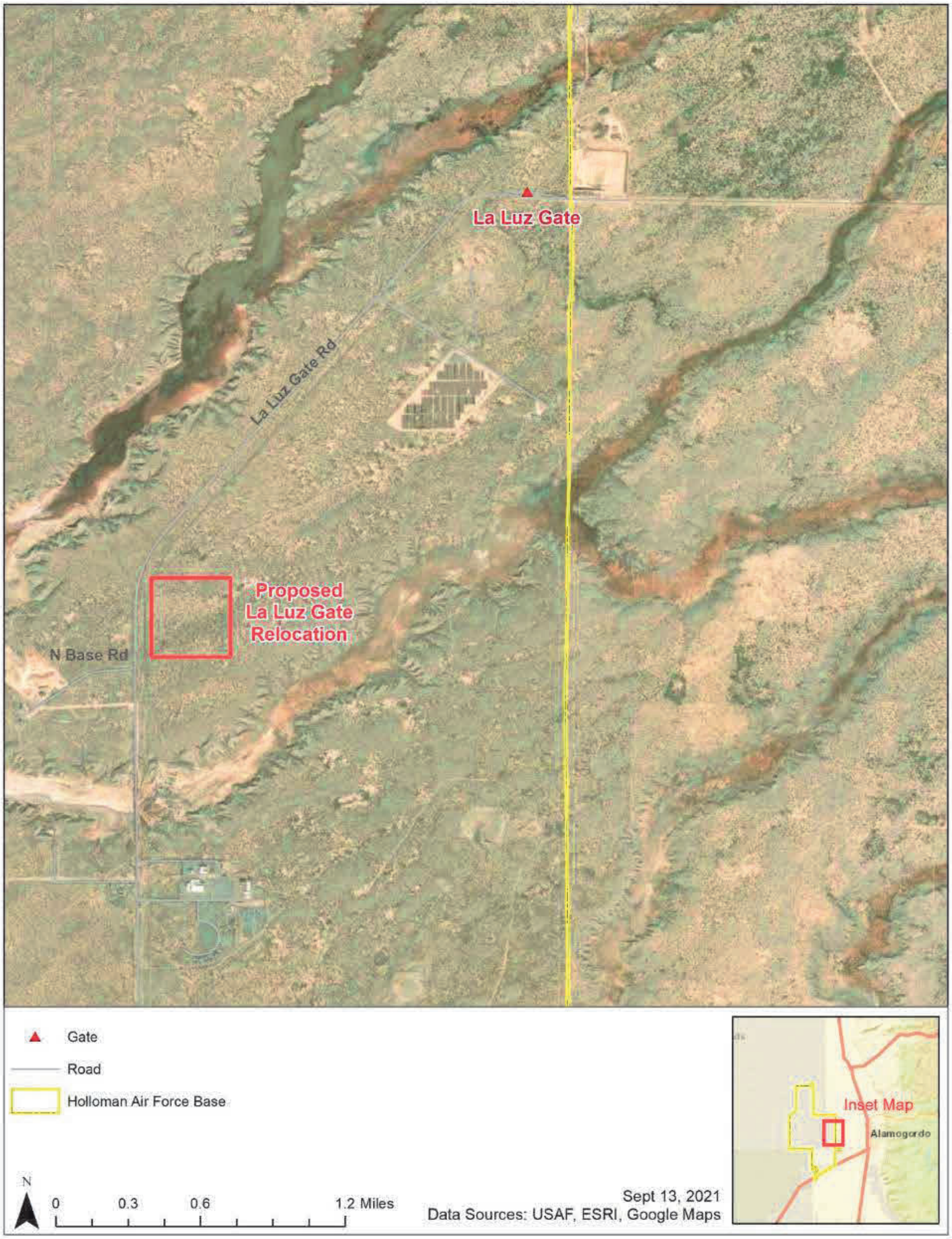
3 Attachments:

1. Location of the Proposed Actions for Airfield Improvement
2. Location of the Proposed Main Gate Repositioning
3. Location of the Proposed La Luz Gate Relocation



Attachment 1. Location of the Proposed Actions for Airfield Improvement

Attachment 2. Location of the Proposed Main Gate Repositioning



Attachment 3. Location of the Proposed La Luz Gate Relocation

Tribal Correspondence and Distribution List

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH WING (AETC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

Colonel Ryan P. Keeney
Commander, 49th Wing
490 First Street, Suite 1700
Holloman AFB NM 88330-8277

Chairman Lyman Guy
Apache Tribe of Oklahoma
PO Box 1330
Anadarko OK 73005

Dear Chairman Guy

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the Airfield Improvements and Gate Repositioning at Holloman Air Force Base (AFB), New Mexico. Per Section 306108 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 Code of Federal Regulation Part 800, *Protection of Historic Properties*, the Air Force is engaging early with tribal governments as it formulates this undertaking.

As part of the proposed undertaking, the Airfield Improvements and Gate Repositioning includes the following elements:

1. Expand the number of end of the runway (EOR) arm and dearm pads to increase stage, arm and launch volume; increase blast dissipation pavement and provide shelter for EOR crews. Additionally, taxiway extensions would be constructed to improve airfield geometry. As part of the proposed taxiway extensions, several excess buildings located within and adjacent to the planned routes would be demolished.

2. Alter the configuration of the Main Gate to meet current and future Antiterrorism and Force Protection (AT/FP) standards, increase traffic flow and reduce traffic congestion in the US Highway 70 deceleration lane.

3. Alter the location or configuration of the La Luz Gate to meet current and future AT/FP standards, increase traffic flow, reduce response time for Security Forces personnel and increase safety.

We have included attachments identifying the locations and limits of the Proposed Action and the working Area of Potential Effects for your review.

In accordance with the NHPA, the Air Force would like to initiate government-to-government consultation regarding the Airfield Improvements and Gate Repositioning project. The Air Force 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.

At your earliest convenience, please provide any information, comments or requests for additional information to Mr. Spencer Robison, Holloman NEPA Program Manager, 49 CES/CEIE, 550 Tabosa Ave, Holloman AFB NM 88330, or e-mail: spencer.robison@us.af.mil. This will ensure we can address them during the environmental impact analysis process. Thank you for your assistance.

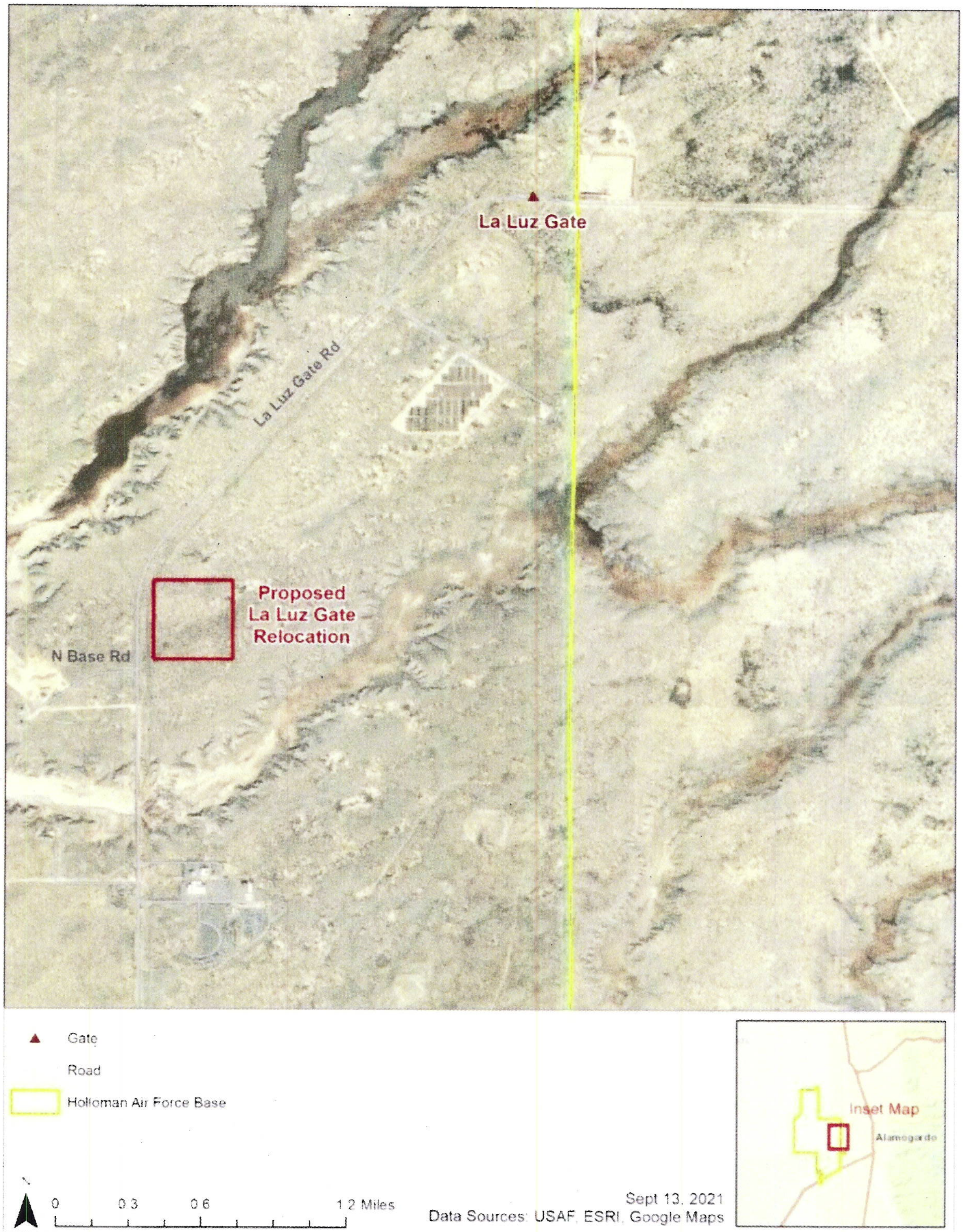
Sincerely

RYAN P. KEENEY, Colonel, USAF

3 Attachments:
1. Location of the Proposed Area of Potential Effect for Airfield Improvement
2. Location of the Proposed Area of Potential Effect for Main Gate Repositioning
3. Location of the Proposed Area of Potential Effect for La Luz Gate Relocation

Attachment 1. Location of the Proposed Area of Potential Effect for Airfield Improvement

Attachment 2. Location of the Proposed Area of Potential Effect for Proposed Main Gate Repositioning



Attachment 3. Location of the Proposed Area of Potential Effect for La Luz Gate Relocation

Government Agency Correspondence and Distribution List

16 Jun 2022

Adam M. Kusmak, USAF
Installation Management, Chief
49th Civil Engineer Squadron
550 Tabosa Ave.
Holloman Air Force Base NM 88330

Mr. Mike Sloane
Director
NM Dept of Game and Fish
One Wildlife Way
Santa Fe NM 87507

Dear Mr. Sloane

In accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations, and the Department of Defense NEPA regulations, the United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate the environmental impact of three projects at Holloman Air Force Base (AFB): airfield improvements, the repositioning of the Main Gate, and the relocation or repositioning of the La Luz Gate (also known as the North Gate). The Proposed Action includes projects that would:

1. Expand the number of end of the runway (EOR) arm/dearm pads to increase stage, arm and launch volume; increase blast dissipation pavement; and provide shelter for EOR crews. Additionally, taxiway extensions would be constructed to improve airfield geometry. As part of the proposed taxiway extensions, several excess buildings located within and adjacent to the planned routes would be demolished.

2. Alter the configuration of the Main Gate to meet current and future Anti-Terrorism/Force Protection (AT/FP) standards, increase traffic flow, and reduce traffic congestion in the US Highway 70 deceleration lane.

3. Alter the location or configuration of the La Luz Gate to meet current and future AT/FP standards, increase traffic flow, reduce response time for Security Forces personnel, and increase safety.

If you have additional information regarding the impacts of the Proposed Actions on the natural environment or other environmental aspects of which we are unaware, we would appreciate receiving such information for inclusion and consideration during the NEPA compliance process. Please respond within 30 days of receipt of this letter to ensure your concerns are adequately addressed in the EA.

Please send your written responses to Mr. Spencer Robison, Holloman NEPA Program Manager, 49 CES/CEIE, 550 Tabosa Ave, Holloman AFB NM 88330 or via email to spencer.robison@us.af.mil.

Sincerely

KUSMAK.ADAM.M.1263331806 Digitally signed by KUSMAK.ADAM.M.1263331806 Date: 2022.06.16 11:20:48 -06'00'

ADAM KUSMAK, GS-13, USAF
Installation Management Chief

PROJECT INFORMATION

Project Title:	Holloman Air Force Base Environmental Assessment Airfield and Gate Improvements
Project Type:	MILITARY, GENERAL (OPERATIONS, INFRASTURCTURE), MAINTENANCE OR CONTINUING OPERATIONS, INFRASTRUCTURE
Latitude/Longitude (DMS):	32.918257 / -106.133730
County(s):	OTERO
Project Description:	The U.S. Air Force is preparing an Environmental Assessment to evaluate the environmental impacts of three projects at Holloman Air Force Base. These include airfield improvements, the repositioning of the Main Gate, and the relocation or repositioning of the La Luz Gate (also known as the North Gate).

REQUESTOR INFORMATION

Project Organization:	US DOD - AIR FORCE
Contact Name:	Virginia Seamster
Email Address:	virginia.seamster@state.nm.us
Organization:	New Mexico Department of Game and Fish
Address:	1 Wildlife Way, Santa Fe NM 87507
Phone:	5056297738

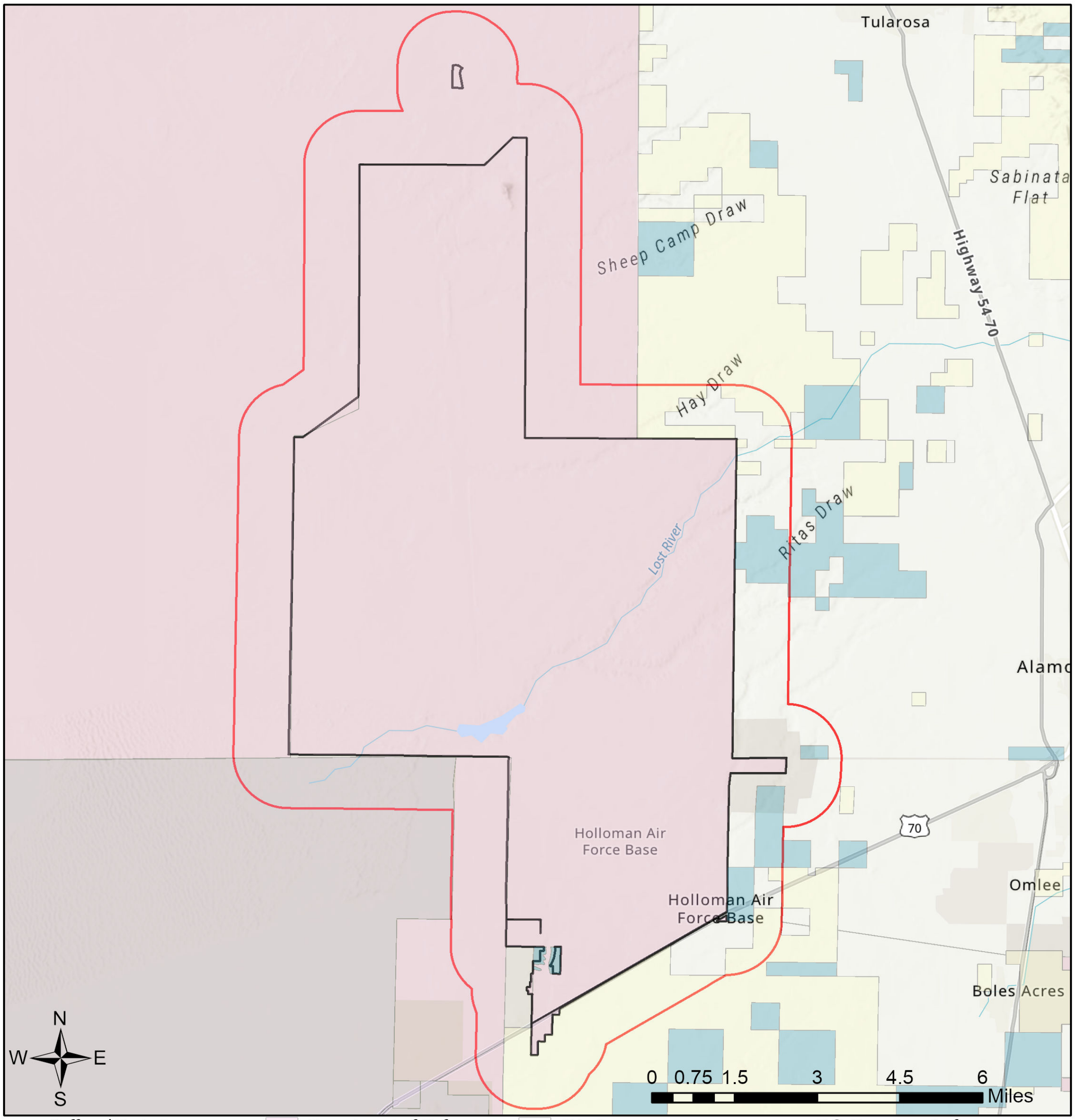
OVERALL STATUS

This report contains an initial list of recommendations regarding potential impacts to wildlife or wildlife habitats from the proposed project; see the Project Recommendations section below for further details. Your project proposal is being forwarded to a New Mexico Department of Game and Fish (Department) biologist for review to determine whether there are any additional recommendations regarding the proposed actions. A Department biologist will be in touch within 30 days if there are further recommendations regarding this project proposal.

About this report:

- This environmental review is based on the project description and location that was entered. The report must be updated if the project type, area, or operational components are modified.
- This is a preliminary environmental screening assessment and report. It is not a substitute for the potential wildlife knowledge gained by having a biologist conduct a field survey of the project area. Federal status and plant data are provided as a courtesy to users. The review is also not intended to replace consultation required under the federal Endangered Species Act (ESA), including impact analyses for federal resources from the U.S. Fish and Wildlife Service (USFWS) using their Information for Planning and Consultation tool.
- The New Mexico Environmental Review Tool (ERT) utilizes species observation locations and species distribution models, both of which are subject to ongoing change and refinement. Inclusion or omission of a species within a report can not guarantee species presence or absence at a precise point location, as might be indicated through comprehensive biological surveys. Specific questions regarding the potential for adverse impacts to vulnerable wildlife populations or habitats, especially in areas with a limited history of biological surveys, may require further on-site assessments.
- The Department encourages use of the ERT to modify proposed projects for avoidance, minimization, or mitigation of wildlife impacts. However, the ERT is not intended to be used in a repeatedly iterative fashion to adjust project attributes until a previously determined recommendation is generated. The ERT serves to asses impacts once project details are developed. The New Mexico Crucial Habitat Assessment Tool is the appropriate system for advising early-stage project planning and design to avoid areas of anticipated wildlife concerns and associated regulatory requirements.

an Air Force Base Environmental Assessment Airfield and Gate Impro



Buffered Project Boundary	Department of Defense	Private	U.S. Department of Agriculture
Project Boundary	Department of Energy	State Land Office	U.S. Fish and Wildlife Service
Bureau of Land Management	NM Department of Game & Fish	State of New Mexico	U.S. Forest Service
City Land	NM State Forestry Division	Tribal Land	U.S. Natural Resources Conservation Service
County Land	NM State Parks	U.S. Army Corps of Engineers	
	National Park Service	U.S. Bureau of Reclamation	

USGS, New Mexico Department of Game and Fish (NMDGF), Natural Heritage New Mexico (NHNM), and USDA Forest Service,

Compiled by Richard Norwood of NHNM over the period 2020 to 2021.
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Special Status Animal Species within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI
Northern Leopard Frog	Lithobates pipiens			SGCN
Eared Grebe	Podiceps nigricollis			SGCN
American Bittern	Botaurus lentiginosus			SGCN
Bald Eagle	Haliaeetus leucocephalus		T	SGCN
Common Black-Hawk	Buteogallus anthracinus		T	SGCN
Aplomado Falcon	Falco femoralis		E	SGCN
Northern Aplomado Falcon	Falco femoralis septentrionalis	LE	E	SGCN
Peregrine Falcon	Falco peregrinus		T	SGCN
American Peregrine Falcon	Falco peregrinus anatum		T	SGCN
Snowy Plover	Charadrius nivosus nivosus			SGCN
Mountain Plover	Charadrius montanus			SGCN
Long-Billed Curlew	Numenius americanus			SGCN
Interior Least Tern	Sternula antillarum athalassos	LE	E	SGCN
Western Burrowing Owl	Athene cunicularia hypugaea			SGCN
Lewis's Woodpecker	Melanerpes lewis			SGCN
Pinyon Jay	Gymnorhinus cyanocephalus			SGCN
Juniper Titmouse	Baeolophus ridgwayi			SGCN
Pygmy Nuthatch	Sitta pygmaea			SGCN
Bendire's Thrasher	Toxostoma bendirei			SGCN
Sprague's Pipit	Anthus spragueii			SGCN
Loggerhead Shrike	Lanius ludovicianus			SGCN
Bell's Vireo	Vireo bellii		T	SGCN
Gray Vireo	Vireo vicinior		T	SGCN
Cassin's Sparrow	Peucaea cassinii			SGCN
Baird's Sparrow	Ammodramus bairdii		T	SGCN
Mccown's Longspur	Rhynchophanes mccownii			SGCN
Chestnut-Collared Longspur	Calcarius ornatus			SGCN
White Sands Pupfish	Cyprinodon tularosa		T	SGCN
Spotted Bat	Euderma maculatum		T	SGCN
Black-Tailed Prairie Dog	Cynomys ludovicianus			SGCN
Cougar	Puma concolor			SERI
Mule Deer	Odocoileus hemionus			SERI
Pronghorn	Antilocapra americana americana			SERI

ESA = Endangered Species Act, WCA = Wildlife Conservation Act, SGCN = Species of Greatest Conservation Need, SERI = Species of Economic and Recreational Importance

Project Recommendations

With implementation of the applicable mitigation or avoidance measures included in the project description, and incorporation of the guidance listed below, the Department does not anticipate significant impacts to wildlife or sensitive wildlife habitats from the proposed project activities. See the "OVERALL STATUS" section above to determine the likelihood that your project will be reviewed further based on its location. If a Department biologist determines that additional conservation measures are needed, then you should expect to receive notification and/or any additional project recommendations within 30 days of your project submission.

Burrowing owl (*Athene cunicularia*) is known to occur within or near your project area. Before any ground disturbing activities occur, the Department recommends that a preliminary survey be conducted by a qualified biologist using the Department's burrowing owl survey protocol. Should burrowing owls be documented in the project area, please contact the Department or USFWS for further recommendations regarding relocation or avoidance of impacts.

The proposed project occurs within or near a riparian area. Because riparian areas are important wildlife habitats, the project footprint should avoid removing any riparian vegetation or creating ground disturbance either directly within or affecting the riparian area, unless the project is intended to restore riparian habitat through non-native plant removal and replanting with native species. If your project involves removal of non-native riparian trees or planting of native riparian vegetation, please refer to the Department's habitat handbook guideline for Restoration and Management of Native and Non-native Trees in Southwestern Riparian Ecosystems.

Your proposed project occurs within an area where springs or other important natural water features occur. This may result in the presence of a high use area for wildlife relative to the surrounding landscape. To ensure continued function of these important wildlife habitats, your project should consider measures to avoid the following.

- Altering surface or groundwater flow or hydrology,
- Disturbance to soil that modifies geomorphic properties or facilitates invasion of non-native vegetation.
- Affecting local surface or groundwater quality.
- Creating disturbance to wildlife utilizing these water features. Disturbance to wildlife can be reduced through practices including clustering infrastructure and activity wherever possible, avoiding large visual obstructions around water features, and limiting nighttime project operations or activities.

Department biologists are available for site-specific consultation regarding measures to assist with management and conservation of these habitat resources.

Disclaimers regarding recommendations:

- The Department provides technical guidance to support the persistence of all protected species of native fish and wildlife, including game and nongame wildlife species. Species listed within this report include those that have been documented to occur within the project area, and others that may not have been documented but are projected to occur within the project vicinity.
- Recommendations are provided by the Department under the authority of § 17-1-5.1 New Mexico Statutes Annotated 1978, to provide "communication and consultation with federal and other state agencies, local governments and communities, private organizations and affected interests responsible for habitat, wilderness, recreation, water quality and environmental protection to ensure comprehensive conservation services for hunters, anglers and nonconsumptive wildlife users".
- The Department has no authority for management of plants or Important Plant Areas. The New Mexico Endangered Plant Program, under the Energy, Minerals, and Natural Resources Department's Forestry Division, identifies and develops conservation measures necessary to ensure the survival of plant species within New Mexico. Plant status information is provided within this report as a courtesy to users. Recommendations provided within the ERT may not be sufficient to preclude impacts to rare or sensitive plants, unless conservation measures are identified in coordination with the Endangered Plant Program.
- Additional coordination may also be necessary under the federal ESA or National Environmental Policy Act (NEPA). Further site-specific recommendations may be proposed during ESA and/or NEPA analyses, or through coordination with affected federal agencies.

APPENDIX B
REASONABLY FORESEEABLE FUTURE ACTIONS

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Table B-1.
Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Projects at Holloman Air Force Base

Scheduled Project	Project Summary	Implementation Date	Relevance to Proposed Action	Interaction with Resources
Holloman Air Force Base				
NC3 Shipping/Storage Facility	MILCON project includes a 67,000-square-foot warehouse in the Basic Expeditionary Airfield Resources Base.	Construction anticipated 2021	Potential construction overlap with the Proposed Action	Noise, Air Quality, Land Use
F-16 Formal Training Unit Permanent Beddown and Relocation	Project at Holloman AFB includes the permanent beddown of additional F-16 FTU squadrons in support of the Formal Training Unit Permanent Beddown and Relocation Plan. The beddown would include adding either 1 or 2 F-16 squadrons and minor construction on and renovation of existing facilities. Improvements include projects on the airfield and in the Administration and Aircraft Operations and Maintenance land use areas.	Anticipated 2022	Potential construction overlap with the Proposed Action.	Infrastructure, Safety, Transportation, Air Quality

Reasonably Foreseeable Future Projects at Holloman Air Force Base

Scheduled Project	Project Summary	Implementation Date	Relevance to Proposed Action	Interaction with Resources
Holloman High Speed Test Track (HHSTT) Operations	Project at the 846th Test Squadron to continue operations of the HHSTT including minor modifications within the existing built environment and processes. Facility modifications are limited to extension of the rain field system attached to the track and modernization of the controls, valves, pumps, and pipes. Operational process modifications are limited to updated best management practices and standard operating procedures that are intended to further avoid adverse impacts on human health and the environment.	Anticipated 2023	Potential construction overlap with the Proposed Action	Noise, Air Quality, Infrastructure, Safety

MILCON = Military construction; EA = Environmental Assessment

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APPENDIX C
SUPPLEMENTAL RESOURCE MATERIAL

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C.1 NOISE

The following sections describe input data used in the noise modeling process. This data was developed in coordination with Holloman Air Force Base (AFB) personnel.

C.1.1 Sound

Sound is a series of vibrations (energy) transmitted through a medium (such as air or water) that is perceived by a receiver (e.g., humans and animals). It is measured by accounting for the energy level represented by the amplitude (volume) and frequency (pitch) of those vibrations and comparing that to a baseline standard. The unit measurement of the intensity of sound is the decibel (dB). The dB is a logarithmic ratio of the increase in atmospheric pressure a sound event causes compared to a defined reference pressure, which is the lowest detectible pressure recognized by the human ear. The sound pressure level represented by a given decibel value is usually adjusted to make it more relevant to sounds that the human ear hears especially well; for example, an "A-weighted" decibel (dBA) is derived by emphasizing mid-range frequencies to which the human ear responds especially well and de-emphasizing lower- and higher-range frequencies. In addition to weighting based on frequency, sound levels are further differentiated by factoring in the effect of time (duration), since sound levels normally vary in intensity and are not continuous.

Sound levels fluctuate over time. For example, the sound increases as an aircraft approaches, then diminishes and blends into the ambient, or background, noise as the aircraft recedes into the distance. Because of this variation, it is often convenient to describe a given noise event by its highest or maximum sound level (L_{max}). It should be noted that L_{max} describes only one dimension of an event and provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical L_{max} may produce very different total noise exposures. One may be of very short duration, while the other may last much longer.

Human perception of sound and noise varies and largely depends on the frequency or frequencies an event produces. Several different scales are used to quantify sound depending on the purpose of the measurement taken. Sound can be quantified with instrumentation that records instantaneous sound levels in dB. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA, 1981a).

Table C-1 compares common sounds and shows how they correspond to potential auditory impacts. As shown, a whisper is normally 30 dBA and considered to be very quiet, while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become irritating at 80 dBA and very annoying at 90 dBA. As sound pressure level is measured on a logarithmic scale, every increase of 3 dB is twice as loud (e.g., 80 dBA is twice as loud as 77 dBA); however, humans do not typically perceive sound to be twice as loud until an increase of at least 10 dB, which can result in inadvertent exposure to hazardous noise levels (USEPA, 1981b).

Table C-1. Typical Sound Levels from Example Activities

Noise Level (dBA)	Common Sounds	Effect[a]	T_{Max}[b]
10	Just audible	Negligible	n/a
30	Soft whisper (15 feet)	Very quiet	n/a
50	Light auto traffic (100 feet)	Quiet	n/a
60	Air conditioning unit (20 feet)	Intrusive	n/a
70	Noisy restaurant or freeway traffic	Telephone use difficult	n/a
80	Alarm clock (2 feet)	Annoying	n/a
90	Heavy truck (50 feet) or city traffic	Very annoying	8 hours
100	Garbage truck	Very annoying	2 hours

Table C-1. Typical Sound Levels from Example Activities

Noise Level (dBA)	Common Sounds	Effect[a]	T_{Max}[b]
110	Pile drivers	Strained vocal effort	30 minutes
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort	7.5 minutes
140	Carrier deck jet operation	Painfully loud	28 seconds

[a] Source: USEPA, 1981b
[b] Source: Occupational Safety and Health Administration, 2017
dBA = A-weighted decibel(s); n/a = not applicable; T_{Max} = maximum time prior to hearing damage

A variety of sounds are emitted from loaders, trucks, graders, and other common construction equipment. Table C-2 presents noise levels associated with common types of construction equipment, which can exceed the ambient sound levels by 20 to 25 dBA in an urban environment. Unobstructed sound pressure levels decrease according to the inverse square law, or approximately 6 dB for every doubling of distance from the source of noise; therefore, as seen in Table C-2, impacts from construction noise are typically confined to within 0.5 miles of a project area.

Table C-2. Estimated Noise Levels for Common Construction Equipment

Construction Equipment	L_{max}[a] 50 ft (dBA)	L_{max}[b] 100 ft (dBA)	L_{max}[b] 250 ft (dBA)	L_{max}[b] 500 ft (dBA)	L_{max}[b] 1,000 ft (dBA)	L_{max}[b] 1,500 ft (dBA)	L_{max}[b] 0.5 mi (dBA)
Backhoe	78	72	64	58	52	48	44
Chain Saw	84	78	70	64	58	54	50
Ground Compactor	83	77	69	63	57	53	49
Concrete Mixer Truck	79	73	65	59	53	49	45
Concrete Pump Truck	81	75	67	61	55	51	47
Crane	81	75	67	61	55	51	47
Dozer	82	76	68	62	56	52	48
Excavator	81	75	67	61	55	51	47
Front End Loader	79	73	65	59	53	49	45
Grapple (Backhoe)	87	81	73	67	61	57	53
Jackhammer	89	83	75	69	63	59	55
Pneumatic Tools	85	79	71	65	59	55	51
Vacuum Excavator	85	79	71	65	59	55	51

[a] Source: United States Department of Transportation, 2006
[b] Derived values utilizing the inverse square law $\left\{L_{p2} = L_{p1} + 20log_{10}\left(\frac{r_1}{r_2}\right)\right\}$ and published values at L_{p1}=L_{50}.
dBA = A-weighted decibel(s); ft = feet; L_{max} = maximum sound level; mi = mile(s)

C.1.2 References

Occupational Safety and Health Administration. 2017. Technical Manual Section III, Chapter 5: Noise (Revised 8/15/13). <https://www.osha.gov/dts/osta/otm/new_noise/ index.html>. Accessed 1 May 2019.

United States Department of Transportation. 2006. FHWA Highway Construction Noise Handbook. FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. NTIS No. PB2006-109012. August.

USEPA. 1981a. Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise. Office of Noise Abatement and Control. October 1979, Revised July 1981.

USEPA. 1981b. Noise and its Measurement. January.

C.2 AIR QUALITY

C.2.1 Detailed Air Conformity Applicability Model Report

Airfield

1. General Information

- Action Location
Base: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Airfield Improvements

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2025

- Action Purpose and Need:
The purpose and need for action include enhancing airfield efficiency to alleviate safety, operational and training shortfalls, as
well as decrease the need to frequently use Runway 07/25 for taxiing during certain weather conditions. Taxiway extensions would allow for improved F-16 recovery and taxiway circulation and overall airfield efficiency.

- Action Description:
The airfield improvements would consist of expanding the number of end of the runway (EOR) arm/dearm pads from 23 to 48 to increase stage, arm, and launch volume; increasing blast dissipation pavement; providing shelter for EOR crews; and extending two taxiways to improve airfield geometry. In addition, excess buildings
located within and adjacent to the planned routes for the taxiway extensions would be demolished.

- Point of Contact
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Taxiway A Parking Pavement
3.	Construction / Demolition	Taxiway A Shoulder Pavement
4.	Construction / Demolition	EOR B Parking Pavement and Demo
5.	Construction / Demolition	EOR B Shoulder Pavement
6.	Construction / Demolition	EOR D Parking Pavement and Demo
7.	Construction / Demolition	EOR D Shoulder Pavement
8.	Construction / Demolition	EOR E Parking Pavement and Demo
9.	Construction / Demolition	EOR E Parking Shoulder and Demo
10.	Construction / Demolition	Extend Taxiway L Parking Pavement and Demo
11.	Construction / Demolition	Taxiway L Shoulder Pavement and Demo
12.	Construction / Demolition	Extended Taxiway J Parking Pavement and Demo
13.	Construction / Demolition	Extend Taxiway J Parking Shoulder and Demo

14.	Construction / Demolition	Building Demo

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: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Taxiway A Parking Pavement

- Activity Description:
Taxiway A - Increase F-16 arming positions from 4 to 6: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.074774
SO_x	0.001053
NO_x	0.390648
CO	0.499423
PM 10	1.546632

Pollutant	Total Emissions (TONs)
PM 2.5	0.017824
Pb	0.000000
NH_3	0.000342
CO_2e	103.7

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 153677

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
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

2.1.4 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

2.2 Paving Phase

2.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

2.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 153677

- 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	2	6
Rollers 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

2.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

2.2.4 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. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Taxiway A Shoulder Pavement

- Activity Description:
Taxiway A - Increase F-16 arming positions from 4 to 6: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.070585
SO_x	0.001082
NO_x	0.383089
CO	0.516745
PM 10	2.778257

Pollutant	Total Emissions (TONs)
PM 2.5	0.016865
Pb	0.000000
NH_3	0.000303
CO_2e	106.0

3.1 Site Grading Phase

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 277582
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
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

3.1.4 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

3.2 Paving Phase

3.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

3.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 27582

- 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

3.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

3.2.4 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)

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: EOR B Parking Pavement and Demo

- Activity Description:
Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1

Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.076659
SO_x	0.001083
NO_x	0.403657
CO	0.503822
PM 10	2.120373

Pollutant	Total Emissions (TONs)
PM 2.5	0.018182
Pb	0.000000
NH_3	0.000411
CO_2e	107.2

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 211312
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 1905

- 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
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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

4.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

4.1.4 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

4.2 Paving Phase

4.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

4.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 172729

- 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	2	6
Rollers 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

4.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

4.2.4 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)

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: EOR B Shoulder Pavement

- Activity Description:
Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.063275
SO_x	0.000947
NO_x	0.339014
CO	0.460727
PM 10	0.433430

Pollutant	Total Emissions (TONs)
PM 2.5	0.015220
Pb	0.000000
NH_3	0.000294
CO_2e	92.8

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 42038
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
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
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

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

5.1.4 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

5.2 Paving Phase

5.2.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 3
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

5.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 42038

- 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

5.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

5.2.4 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)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: EOR D Parking Pavement and Demo

- Activity Description:
Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.100651
SO_x	0.001398
NO_x	0.530578
CO	0.676528
PM 10	3.254763

Pollutant	Total Emissions (TONs)
PM 2.5	0.025173
Pb	0.000000
NH_3	0.000454
CO_2e	139.5

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 1
Number of Days: 0

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 324639
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 2743

- 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
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

6.1.4 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

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 3
Number of Days: 0

6.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 269096

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	6
Rollers Composite	2	6

- 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

6.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

6.2.4 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)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: EOR D Shoulder Pavement

- Activity Description:
Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.083743
SO_x	0.001215

Pollutant	Total Emissions (TONs)
PM 2.5	0.020473
Pb	0.000000

NO_x	0.446465
CO	0.617598
PM 10	0.662112

NH_3	0.000413
CO_2e	118.9

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 64497
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
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
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

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

7.1.4 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

7.2 Paving Phase

7.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 3
Number of Days: 0

7.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 64497

- 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

7.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

7.2.4 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)

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: EOR E Parking Pavement and Demo

- Activity Description:
Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.074844
SO_x	0.001055
NO_x	0.391478
CO	0.499703
PM 10	1.569756

Pollutant	Total Emissions (TONs)
PM 2.5	0.017847
Pb	0.000000
NH_3	0.000346
CO_2e	104.0

8.1 Site Grading Phase

8.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

8.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 155999
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 137

- 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
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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

8.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

8.1.4 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

8.2 Paving Phase

8.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

8.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 153229

- 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	2	6
Rollers 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

8.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

8.2.4 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)

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: EOR E Parking Shoulder and Demo

- Activity Description:
Increase F-16 arming positions from 8 to 12: Remove degraded pavement; add new and additional pavement; install taxiway and parking spot markings; construct EOR crew shelter.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.065046
SO_x	0.000979
NO_x	0.352969
CO	0.465446
PM 10	0.981235

Pollutant	Total Emissions (TONs)
PM 2.5	0.015604
Pb	0.000000
NH_3	0.000367
CO_2e	96.5

9.1 Site Grading Phase

9.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 1
Number of Days: 0

9.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 97063
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 2121

- 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
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
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

9.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

9.1.4 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

9.2 Paving Phase

9.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

9.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 54108

- 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

9.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

9.2.4 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)

10. Construction / Demolition

10.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Extend Taxiway L Parking Pavement and Demo

- Activity Description:
Taxiway L: Extend taxiway from
Runway 7-25 to Runway 04-22

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.333171
SO_x	0.004861
NO_x	1.724406
CO	2.041020
PM 10	24.857796

Pollutant	Total Emissions (TONs)
PM 2.5	0.077076
Pb	0.000000
NH_3	0.001367
CO_2e	487.1

10.1 Site Grading Phase

10.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

10.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1245500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 10570

- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	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

10.1.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

10.1.4 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

10.2 Paving Phase

10.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

10.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 1031450

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- 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

10.2.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

10.2.4 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)

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location

County: Otero

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Taxiway L Shoulder Pavement and Demo

- Activity Description:
Taxiway L: Extend taxiway from Runway 7-25 to Runway 04-22

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.319259
SO_x	0.004805
NO_x	1.700145
CO	2.032817
PM 10	17.130902

Pollutant	Total Emissions (TONs)
PM 2.5	0.076409
Pb	0.000000
NH_3	0.001239
CO_2e	480.6

11.1 Site Grading Phase

11.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

11.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 857171
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 10218

- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8

Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	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

11.1.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

11.1.4 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

11.2 Paving Phase

11.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

11.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 650252

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- 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

11.2.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45

Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

11.2.4 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)

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Extended Taxiway J Parking Pavement and Demo

- Activity Description:
Extend taxiway from Taxiway A to Taxiway R

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.346833
SO_x	0.004888
NO_x	1.736063
CO	2.044962
PM 10	32.320910

Pollutant	Total Emissions (TONs)
PM 2.5	0.077397
Pb	0.000000
NH_3	0.001429
CO_2e	490.2

12.1 Site Grading Phase

12.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

12.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1620590
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 8591

- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	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

12.1.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

12.1.4 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

12.2 Paving Phase

12.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

12.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 1446619

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- 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

12.2.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

12.2.4 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)

13. Construction / Demolition

13.1 General Information & Timeline Assumptions

- Activity Location
County: Otero

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Extend Taxiway J Parking Shoulder and Demo

- Activity Description:
Extend taxiway from Taxiway A to Taxiway R

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.321800
SO_x	0.004790
NO_x	1.693621
CO	2.030610
PM 10	18.429811

Pollutant	Total Emissions (TONs)
PM 2.5	0.076229
Pb	0.000000
NH_3	0.001204
CO_2e	478.9

13.1 Site Grading Phase

13.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 2
Number of Days: 0

13.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 922466
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 8189

- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8

Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	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

13.1.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

13.1.4 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

13.2 Paving Phase

13.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 6
Number of Days: 0

13.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 756637

- 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
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- 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

13.2.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45

Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

13.2.4 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)

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location
County: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Building Demo

- Activity Description:
Demo of buildings B809, B904, B909, and B918.

- Activity Start Date
Start Month: 1
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.042423
SO_x	0.000765
NO_x	0.260489
CO	0.391951
PM 10	0.111508

Pollutant	Total Emissions (TONs)
PM 2.5	0.008896
Pb	0.000000
NH_3	0.000374
CO_2e	76.4

14.1 Demolition Phase

14.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 4
Number of Days: 0

14.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 27125
Height of Building to be demolished (ft): 18

- 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
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

14.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

14.1.4 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

La Luz 1

1. General Information

- Action Location
Base: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: La Luz Gate Alternative 1: Reposition La Luz Gate

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2027

- Action Purpose and Need:
The current location and alignment of La Luz Gate does not meet modern anti-terrorism and force protection standards. Additionally, the remote location of La Luz Gate necessitates pre-positioning of security forces and other emergency response personnel as response time to the gate is not adequate under normal conditions.

- Action Description:
Relocate gate entrance approximately 2.5 to 3 miles south, to include a guardhouse, three identification check lanes with booths, a 2-lane inspection building, and an overwatch tower or pad. Extend security fence and cable barriers to meet the relocated entrance. Demolish current facilities and excess pavement.

- Point of Contact
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Reposition La Luz Gate

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: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Reposition La Luz Gate

- Activity Description:
Relocate gate entrance approximately 2.5 to 3 miles south, to include a guardhouse, three identification check lanes with booths, a 2-lane inspection building, and an overwatch tower or pad. Extend security fence and cable barriers to meet the relocated entrance. Demolish current facilities and excess pavement.

- Activity Start Date
Start Month: 1
Start Month: 2027

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.228106
SO_x	0.002319
NO_x	0.702635
CO	1.028136
PM 10	1.907771

Pollutant	Total Emissions (TONs)
PM 2.5	0.028055
Pb	0.000000
NH_3	0.000767
CO_2e	226.3

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 8176
Height of Building to be demolished (ft): 20

- 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
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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 184697
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
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 2
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 795.2
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 Equipment 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)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 3
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 3
Number of Days: 0

2.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 7952

Height of Building (ft): 20
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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 5
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 7952
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	000.309	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

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: 3
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 2
Number of Days: 0

2.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 134509

- 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	2	6
Rollers 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)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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)

La Luz 2

1. General Information

- Action Location

Base: HOLLOMAN AFB
State: New Mexico

County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: La Luz Gate Alternative 2: Renovate Existing Facilities at La Luz Gate

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2027

- Action Purpose and Need:
The current location and alignment of La Luz Gate does not meet modern anti-terrorism and force protection standards. Additionally, the remote location of La Luz Gate necessitates pre-positioning of security forces and other emergency response personnel as response time to the gate is not adequate under normal conditions.

- Action Description:
Renovate current facilities, expand to three identification check stations with booths, add a 2-lane inspection building and an overwatch tower or pad.

- Point of Contact
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Vehicle Inspection

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: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Vehicle Inspection

- Activity Description:
Renovation of vehicle inspection, gatehouse, guard structures, and canopy. New construction of 100,000 square feet of pavement.

- Activity Start Date
Start Month: 1
Start Month: 2027

- Activity End Date
Indefinite: False

End Month: 12
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.167323
SO_x	0.001019
NO_x	0.371304
CO	0.502741
PM 10	1.011785

Pollutant	Total Emissions (TONs)
PM 2.5	0.016961
Pb	0.000000
NH_3	0.000348
CO_2e	100.3

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 100000
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
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
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

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

2.1.4 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

2.2 Architectural Coatings Phase

2.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 3
Number of Days: 0

2.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 8336
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

2.2.3 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	000.604	000.007	000.679	005.119	000.013	000.012		000.033	00365.157
LDGT	000.784	000.010	001.171	008.128	000.015	000.013		000.034	00488.008
HDGV	001.315	000.015	003.118	025.189	000.035	000.031		000.045	00760.452
LDDV	000.249	000.003	000.329	003.517	000.007	000.006		000.008	00371.991
LDDT	000.550	000.005	000.880	007.137	000.008	000.008		000.008	00579.910
HDDV	000.934	000.014	009.704	002.987	000.373	000.344		000.031	01586.560
MC	002.847	000.008	000.870	014.993	000.028	000.025		000.051	00396.071

2.2.4 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

2.3 Paving Phase

2.3.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 2
Start Quarter: 1

Start Year: 2027

- Phase Duration
Number of Month: 2
Number of Days: 0

2.3.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 100000

- 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	2	6
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

2.3.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

2.3.4 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)

La Luz 3

1. General Information

- Action Location
Base: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: La Luz Gate Alternative 3: Close and Demolish La Luz Gate

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2027

- Action Purpose and Need:
The current location and alignment of La Luz Gate does not meet modern anti-terrorism and force protection standards. Additionally, the remote location of La Luz Gate necessitates pre-positioning of security forces and other emergency response personnel as response time to the gate is not adequate under normal conditions.

- Action Description:
Permanently close and demolish current facilities and excess pavement. Erect a gate across La Luz Gate Road at base boundary for use during emergencies.

- Point of Contact
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Demolition of La Luz Gate

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: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demolition of La Luz Gate

- Activity Description:
Includes demo of guard house, canopy, and gate stations, as well as site grading of previously paved areas.

- Activity Start Date
Start Month: 1
Start Month: 2027

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.033309
SO_x	0.000607
NO_x	0.191986
CO	0.245902
PM 10	0.382672

Pollutant	Total Emissions (TONs)
PM 2.5	0.007013
Pb	0.000000
NH_3	0.000163
CO_2e	60.6

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 8336
Height of Building to be demolished (ft): 20

- 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
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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 2
Start Quarter: 1

Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 34240
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
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
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)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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

Main Gate

1. General Information

- Action Location
Base: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Repositioning of Main Gate

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2027

- Action Purpose and Need:
Improve gate security, increase safety, and reduce traffic congestion.

- Action Description:
Repositioning of the HAFB Main Gate and adding additional access control facilities.

- Point of Contact
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Repositioning of the Main Gate

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: Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Repositioning of the Main Gate

- Activity Description:
Includes construction of new gate facilities, visitor's center, guardhouse, traffic, and parking pavement etc. Also include demolition of existing facilities upon completion of the new gate.

- Activity Start Date
Start Month: 1
Start Month: 2027

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.314966
SO_x	0.003486
NO_x	1.029977
CO	1.521753
PM 10	7.766904

Pollutant	Total Emissions (TONs)
PM 2.5	0.040330
Pb	0.000000
NH_3	0.000934
CO_2e	341.1

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 10686
Height of Building to be demolished (ft): 20

- 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

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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 2027

- Phase Duration

Number of Month: 2
Number of Days: 0

2.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 385585
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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	3	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

2.2.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 2
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1003
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 Equipment 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 3
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 3
Number of Days: 0

2.4.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 10028
Height of Building (ft): 20

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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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: 5
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 1
Number of Days: 0

2.5.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 10028
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	000.309	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

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: 5
Start Quarter: 1
Start Year: 2027

- Phase Duration
Number of Month: 2
Number of Days: 0

2.6.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 241089

- 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
Pavers Composite	1	8

Paving Equipment Composite	2	6
Rollers Composite	2	6

- 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- 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	000.309	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

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)

C.2.2 Summary Air Conformity Applicability Model Report Record of Air Analysis (ROAA)

Airfield

1. General Information

The 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 Manual 32-7002, Environmental Compliance and Pollution Prevention; 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: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Airfield Improvements

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2025

e. Action Description:

The airfield improvements would consist of expanding the number of end of the runway (EOR) arm/dearm pads from 23 to 48 to increase stage, arm, and launch volume; increasing blast dissipation pavement; providing shelter for EOR crews; and extending two taxiways to improve airfield geometry. In addition, excess buildings
located within and adjacent to the planned routes for the taxiway extensions would be demolished.

f. Point of Contact:
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.973	250	No
NOx	10.353	250	No
CO	12.781	250	No
SOx	0.029	250	No
PM 10	106.197	250	Yes
PM 2.5	0.463	250	No
Pb	0.000	25	No
NH3	0.009	250	No
CO2e	2881.8		

2026 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	No
NOx	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM 10	0.000	250	No
PM 2.5	0.000	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	0.0		

The estimated annual net emissions associated with this action temporarily exceed the insignificance indicators. However, the steady state estimated annual net emissions are below the insignificance indicators showing no significant long-term impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

1/25/2022

Jessie Moore, Env. Scientist — DATE

La Luz 1

1. General Information

The 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 Manual 32-7002, Environmental Compliance and Pollution Prevention; 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: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: La Luz Gate Alternative 1: Reposition La Luz Gate

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2027

e. Action Description:

Relocate gate entrance approximately 2.5 to 3 miles south, to include a guardhouse, three identification check lanes with booths, a 2-lane inspection building, and an overwatch tower or pad. Extend security fence and cable barriers to meet the relocated entrance. Demolish current facilities and excess pavement.

f. Point of Contact:
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

Analysis Summary:

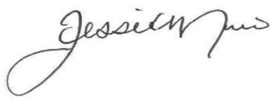
2027

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.228	250	No
NOx	0.703	250	No
CO	1.028	250	No
SOx	0.002	250	No
PM 10	1.749	250	No
PM 2.5	0.028	250	No
Pb	0.000	25	No
NH3	0.001	250	No
CO2e	226.3		

2028 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	No
NOx	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM 10	0.000	250	No
PM 2.5	0.000	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	0.0		

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.



1/25/2022

Jessie Moore, Env. Scientist — DATE

La Luz 2

1. General Information

The 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 Manual 32-7002, Environmental Compliance and Pollution Prevention; 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: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: La Luz Gate Alternative 2: Renovate Existing Facilities at La Luz Gate

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2027

e. Action Description:

Renovate current facilities, expand to three identification check stations with booths, add a 2-lane inspection building and an overwatch tower or pad.

f. Point of Contact:
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving “steady state” (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

“Insignificance Indicators” were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are “Clearly Attainment” (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are “Near Nonattainment” (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

The action’s net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

Analysis Summary:

2027

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.167	250	No
NOx	0.371	250	No
CO	0.503	250	No
SOx	0.001	250	No
PM 10	1.012	250	No
PM 2.5	0.017	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	100.3		

2028 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	No
NOx	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM 10	0.000	250	No
PM 2.5	0.000	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	0.0		

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

1/25/2022

Jessie Moore, Env. Scientist DATE

La Luz 3

1. General Information

The 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 Manual 32-7002, Environmental Compliance and Pollution Prevention; 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: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: La Luz Gate Alternative 3: Close and Demolish La Luz Gate

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2027

e. Action Description:

Permanently close and demolish current facilities and excess pavement. Erect a gate across La Luz Gate Road at base boundary for use during emergencies.

f. Point of Contact:
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving “steady state” (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

“Insignificance Indicators” were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are “Clearly Attainment” (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are “Near Nonattainment” (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

The action’s net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

Analysis Summary:

2027

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.033	250	No
NOx	0.192	250	No
CO	0.246	250	No
SOx	0.001	250	No
PM 10	0.383	250	No
PM 2.5	0.007	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	60.6		

2028 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	No
NOx	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM 10	0.000	250	No
PM 2.5	0.000	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	0.0		

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

1/25/2022

Jessie Moore, Env. Scientist DATE

Main Gate

1. General Information

The 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 Manual 32-7002, Environmental Compliance and Pollution Prevention; 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: HOLLOMAN AFB
State: New Mexico
County(s): Otero
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Repositioning of Main Gate

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2027

e. Action Description:

Repositioning of the HAFB Main Gate and adding additional access control facilities.

f. Point of Contact:
Name: Jessie Moore
Title: Env. Scientist
Organization: HazAir
Email: jessie.moore@hazair.com
Phone Number: 5057025632

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

Analysis Summary:

2027

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.315	250	No
NOx	1.030	250	No
CO	1.522	250	No
SOx	0.003	250	No
PM 10	7.767	250	No
PM 2.5	0.040	250	No
Pb	0.000	25	No
NH3	0.001	250	No
CO2e	341.1		

2028 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	No
NOx	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM 10	0.000	250	No
PM 2.5	0.000	250	No
Pb	0.000	25	No
NH3	0.000	250	No
CO2e	0.0		

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs. No further air assessment is needed.

1/25/2022

Jessie Moore, Env. Scientist — DATE

C.3 BIOLOGICAL RESOURCES

C.3.1 Definition of the Resource

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

Special status species include plant and animal species (1) listed as endangered, threatened, or proposed for listing by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) and their designated critical habitats; (2) protected by the federal Migratory Bird Treaty Act (MBTA) of 1981; (3) protected under the Bald and Golden Eagle Protection Act (BGEPA) of 1940; or (4) listed under state ESAs or similar conservation laws.

C.3.1.1 Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 United States Code [U.S.C.] § 1531 et seq.) established protection over and conservation of threatened and endangered species and their ecosystems. Sensitive and protected biological resources include plant and animal species listed as threatened, endangered, or special status by the USFWS and National Marine Fisheries Service (NMFS). Under the ESA (16 U.S.C. § 1536), an “endangered species” is defined as any species in danger of extinction throughout all, or a large portion, of its range. A “threatened species” is defined as any species likely to become an endangered species in the foreseeable future. The USFWS maintains a list of species considered to be candidates for possible listing under the ESA. The ESA also allows the designation of geographic areas as critical habitat for threatened or endangered species. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA.

Section 9 of the ESA prohibits the take of federally listed species. “Take” as defined under the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Section 7 of the ESA prohibits any federal agency from engaging in any action that is likely to "jeopardize" the continued existence of listed endangered or threatened species or that destroys or adversely affects the critical habitat of such species. Any federal agency proposing an action that may adversely impact an endangered or threatened species must consult with USFWS or NMFS (on an informal or formal basis, as appropriate) before carrying out such action. Species proposed for listing under the ESA (candidate species) are not protected by the law; however, these species could become federally listed in the near future and therefore are considered in this analysis to avoid future conflicts. Under Section 10(j) of the ESA, the USFWS can designate reintroduced populations established outside of the species’ current range, but within its historical range, as “experimental”. The experimental population can be designated as “essential” or “non-essential” to the continued existence of the species. The regulatory restrictions are considerably reduced for a species with a Nonessential Experimental Population designation. The USFWS designates critical habitat through a formal process to provide protection for habitat areas believed to be essential to a species’ conservation.

C.3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 makes it unlawful for anyone to take migratory birds or their parts, nests, or eggs unless permitted to do so by regulations. Per the MBTA, “take” is defined as to “pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 Code of Federal Regulations § 10.12). Migratory birds include nearly all species in the United States, with the exception of some upland game birds and nonnative species.

Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires all federal agencies undertaking activities that may negatively impact migratory birds to follow a prescribed set of actions to implement the MBTA protections.

The National Defense Authorization Act for Fiscal Year 2003 (Public Law 107-314, 116 Stat. 2458) provided the Secretary of the Interior the authority to prescribe regulations that exempt the armed forces from the incidental take of migratory birds during authorized military readiness activities. Congress defined military readiness activities as all training and operations of the US Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.

In December 2017, the US Department of the Interior issued M-Opinion 37050 (U.S. Department of Interior, 2017) which concluded that the take of migratory birds from an activity is not prohibited by the MBTA when the underlying purpose of that activity is not the take of a migratory bird. The USFWS interprets the M-Opinion to mean that the MBTA's prohibition on take does not apply when the take of birds, eggs, or nests occurs as a result of an activity, the purpose of which is not to take birds, eggs, or nests.

On 7 January 2021, the USFWS issued Final Rule (86 Federal Register 1134), effective 8 February 2021 determining that the MBTA's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same, applies only to actions directed at migratory birds, their nests, or their eggs; however, the USFWS delayed the implementation of the final MBTA rule until 8 March 2021 in conformity with the Congressional Rule Act (86 Federal Register 8715).

C.3.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. § 668 to 668c) deems it illegal to "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*), alive or dead, or any part, nest, or egg thereof." "Take" is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb," and "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, injury to an eagle, a decrease in productivity by substantially interfering with the eagle's normal breeding, feeding or sheltering behavior, or nest abandonment by substantially interfering with the eagle's normal breeding, feeding or sheltering behavior." The Bald and Golden Eagle Protection Act also prohibits activities around an active or inactive nest site that could result in an adverse impact on the eagle.

C.3.1.4 Invasive Species

As defined in Executive Order 13112, invasive species are "an alien species whose introduction does or is likely to cause economic or environmental harm to human health." Invasive species are highly adaptable and often displace native species. The characteristics that enable them to do so include high reproduction rates, resistance to disturbances, lack of natural predators, efficient dispersal mechanisms, and the ability to outcompete native species for food, habitat and resources.

APPENDIX D
LIST OF PREPARERS AND CONTRIBUTORS

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LIST OF PREPARERS AND CONTRIBUTORS

The following individuals assisted in the preparation of this Environmental Assessment:

Courtney Addie
HazAir, Inc.
M. Business Administration
B.A. Business Management
Years of Experience: 20
Contribution: QA/QC

Brian Bishop
Versar, Inc.
Environmental Scientist
M.S. Environmental Science
B.S. Biology
Years of Experience: 18
Contribution: Safety, Biological Resources

Mackenzie Caldwell Rohm
Versar, Inc.
M.A. Anthropology/Archaeology
B.A. Anthropology/Archaeology/Sociology
Years of Experience: 17
Contribution: Cultural Resources

Madison Correiro
Versar, Inc.
Environmental Scientist, Jr.
B.S. Environmental Science
Years of Experience: 2
Contribution: Administrative Record

Sophie Desmond
Versar, Inc.
Technical Editor
B.A. English
Years of Experience: 4
Contribution: Editing, Report Production

Steven Douglas
Versar, Inc.
GIS Specialist
M.S. Environmental Science
B.S. Environmental Science
Years of Experience: 6
Contribution: GIS

Jessie Moore
HazAir, Inc.
Environmental Scientist
B.S. Environmental Science
Years of Experience: 3
Contribution: Air Quality, HazMat,
Geological Resources, Water Resources

Danny Taylor
HazAir, Inc.
Project Manager
B.S. Materials Engineering
Years of Experience: 14
Contribution: Noise, Transportation, QA/QC

Ingrid Taylor
HazAir, Inc.
Technical Editor
M.F.A. Writing
Years of Experience: 5
Contribution: Editing, QA/QC

Government Contributors

The following individuals contributed to this Environmental Assessment:

Contributor	Organization/Affiliation
Kristen Long	USACE Albuquerque District
Jeniffer Montes Olmo	49 CES/CENPP
Adam Kusmak	49 CES/CEI
Spencer Robinson	49 CES/CEIE

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