Draft

Environmental Assessment

for Jacks Valley District Development,
U.S. Air Force Academy, Colorado

September

2021

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ABBREVIATIONS AND ACRONYMS

ABEL	Adventure-Based Experiential Learning
ac	acre
ACM	asbestos-containing material
AFI	Air Force Instruction
APE	area of potential effects
ATV	all-terrain vehicle
BCT	Basic Cadet Training
BMP	best management practice
CATM	Combat Arms Training and Maintenance
CBRNE	chemical, biological, radiological, and nuclear explosives
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CSU	Colorado Springs Utilities
CWA	Clean Water Act
dBA	A-weighted decibels
DNL	Day-Night Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
FERL	Field Engineering Readiness Laboratory
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
ft	foot
GHG	greenhouse gas
gpd	gallons per day
I-25	Interstate 25
ID	identification
IED	Improvised Explosive Device
JVDP	Jacks Valley District Plan
LBP	lead-based paint
MBTA	Migratory Bird Treaty Act
MMA	Mouse Management Area
MSA	munitions storage area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act

NOA	Notice of Availability
NO_X	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PA	Programmatic Agreement
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
$PM_{2.5}$	particulate matter measured less than or equal to 2.5 microns in diameter
PM_{10}	particulate matter measured less than or equal to 10 microns in diameter
PMJM	Preble's meadow jumping mouse (*Zapus hudsonius preblei*)
POL	petroleum, oils, and lubricants
POW	Prisoner of War
SDZ	surface danger zone
SHPO	State Historic Preservation Office
SO_X	sulfur oxides
sq ft	square foot
TCP	traditional cultural properties
tpy	tons per year
UFC	Unified Facilities Criteria
USAF	U.S. Air Force
USAFA	U.S. Air Force Academy
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WWTP	wastewater treatment plant

Cover Sheet

Draft
Environmental Assessment for
Jacks Valley District Development
at U.S. Air Force Academy, Colorado

Responsible Agencies: U.S. Air Force (USAF); 10th Air Base Wing.

Affected Location: U.S. Air Force Academy (USAFA), Colorado.

Report Designation: Preliminary Draft Environmental Assessment (EA).

Abstract: This EA supports USAF's *Environmental Impact Analysis Process* (EIAP) for the proposed district development within Jacks Valley, USAFA, Colorado. Under this proposal, USAF would implement 28 projects that were identified as priorities for development in the Jacks Valley District Plan (JVDP), completed in September 2020. The JVDP identifies requirements for the improvement of the physical infrastructure and functionality of Jacks Valley, including current and future mission, facilities, and infrastructure requirements; development constraints and opportunities; and land use relationships. Evaluating all 28 projects as individual Proposed Actions in one integrated EA streamlines National Environmental Policy Act compliance and facilitates the district development process.

The purpose of implementing the Proposed Actions is to develop Jacks Valley into a well-connected, safe and secure, premier cadet training site with multipurpose, collaborative spaces and maximized natural open spaces, in accordance with the JVDP. The Proposed Actions are needed to support USAFA capabilities within Jacks Valley for cadet training, to provide flexibility for future training requirements, and to improve efficiency of infrastructure and training venues within Jacks Valley while protecting cultural and natural resources.

Written inquiries regarding this document should be directed to Mr. Barry Schatz at barry.schatz.2@us.af.mil or by postal mail at: Barry Schatz, 8120 Edgerton Drive, USAFA, Colorado, 80840.

PRIVACY NOTICE

This EA is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality NEPA Regulations (40 CFR Parts 1500-1508; July 2020 version), and 32 CFR Part 989, Environmental Impact Analysis Process (EIAP).

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

Public commenting allows the USAF to make better, informed decisions. Letters or other written or oral comments provided may be published in the Final Environmental Assessment (EA). 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 Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of Final EA. However, only the names of the individuals making comments and the specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

DRAFT

ENVIRONMENTAL ASSESSMENT

FOR

JACKS VALLEY DISTRICT DEVELOPMENT AT U.S. AIR FORCE ACADEMY, COLORADO

PREPARED FOR:

10 CES
8120 EDGERTON DRIVE
U.S. AIR FORCE ACADEMY, CO
80840

SEPTEMBER 2021

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1. Purpose of and Need for the Proposed Action

1.1 Introduction

The U.S. Air Force Academy (USAFA) has identified priorities for district development within Jacks Valley, USAFA, Colorado, and proposes to implement them to maintain the USAFA mission. This Environmental Assessment (EA) supports the U.S. Air Force's (USAF's) *Environmental Impact Analysis Process* (EIAP) for the proposed Jacks Valley district development. The EA analyzes the potential for significant environmental impacts associated with the Proposed Action and alternatives, including the No Action Alternative. The environmental documentation process associated with preparing the EA is carried out in compliance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508, July 2020 version); and the USAF implementing regulation for NEPA, the EIAP at 32 CFR Part 989, as amended.

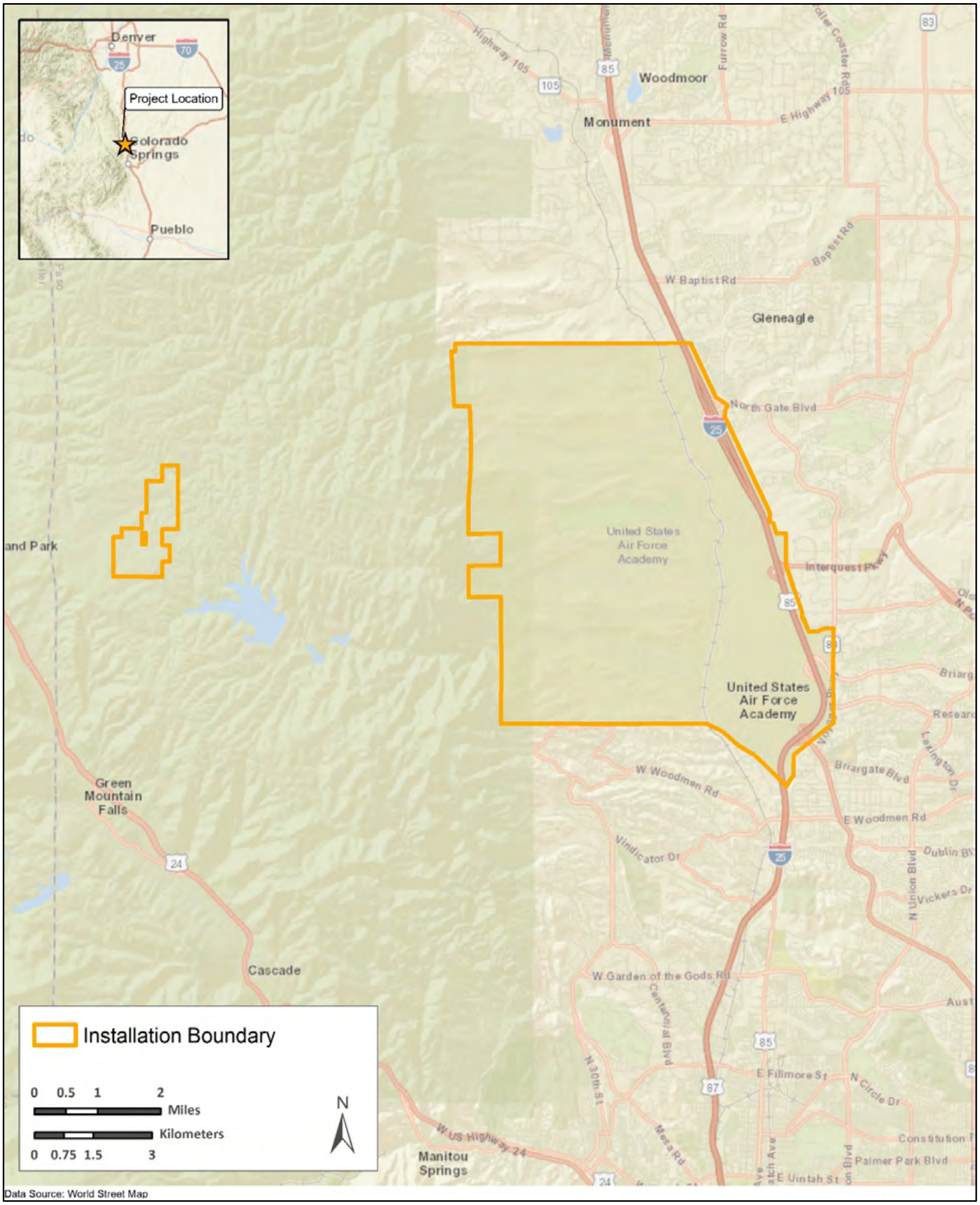
The intent of district development within Jacks Valley is to provide infrastructure improvements necessary to support the USAFA mission. The 28 projects presented in this EA were identified as priorities for development in the Jacks Valley District Plan (JVDP; USAF 2020). The JVDP identifies requirements for the improvement of the physical infrastructure and functionality of Jacks Valley, including current and future mission, facilities, and infrastructure requirements; development constraints and opportunities; and land use relationships. USAFA intends to streamline NEPA compliance and facilitate the district development process by evaluating, in one integrated document, the potential impacts on the human environment of the 28 projects proposed for execution. These projects are listed in **Section 1.6, Table 1-1**.

The information presented in this EA serves as the basis for deciding whether the proposed projects would result in a significant impact on the human environment, requiring the preparation of an Environmental Impact Statement (EIS), or whether no significant impacts would occur, in which case a Finding of No Significant Impact (FONSI) would be appropriate. If the execution of any of the proposed projects would involve "construction" in a wetland as defined in Executive Order (EO) 11990, *Protection of Wetlands*, or "action" in a floodplain under EO 11988, *Floodplain Management*, a Finding of No Practicable Alternative (FONPA) would be prepared in conjunction with the FONSI.

1.2 Background

1.2.1 U.S. Air Force Academy

USAFA is a regionally accredited university and military service academy established in 1954 near Monument and Colorado Springs, Colorado (see **Figure 1-1**). USAFA occupies 18,455 acres (ac) and is situated along the Rocky Mountain Front Range, about 6 miles north of downtown Colorado Springs and approximately 60 miles south of Denver. USAFA land covers an area that is about 5 miles wide by 7 miles long and also includes a satellite property west of the main installation. In addition, USAFA has the Bullseye Auxiliary Airfield, which is approximately 37 miles to the east-southeast of the main installation and is not shown in **Figure 1-1** because of the map extent.

1 

2 **Figure 1-1. USAFA and Surrounding Area**

USAFA is the premier military education institution for USAF, providing world-class education and research in air, space, and cyberspace fields. The USAFA mission is to “educate, train, and inspire men and women to become officers of character motivated to lead the Department of the Air Force in service to our nation” (USAF 2020).

1.2.2 Installation Master Planning

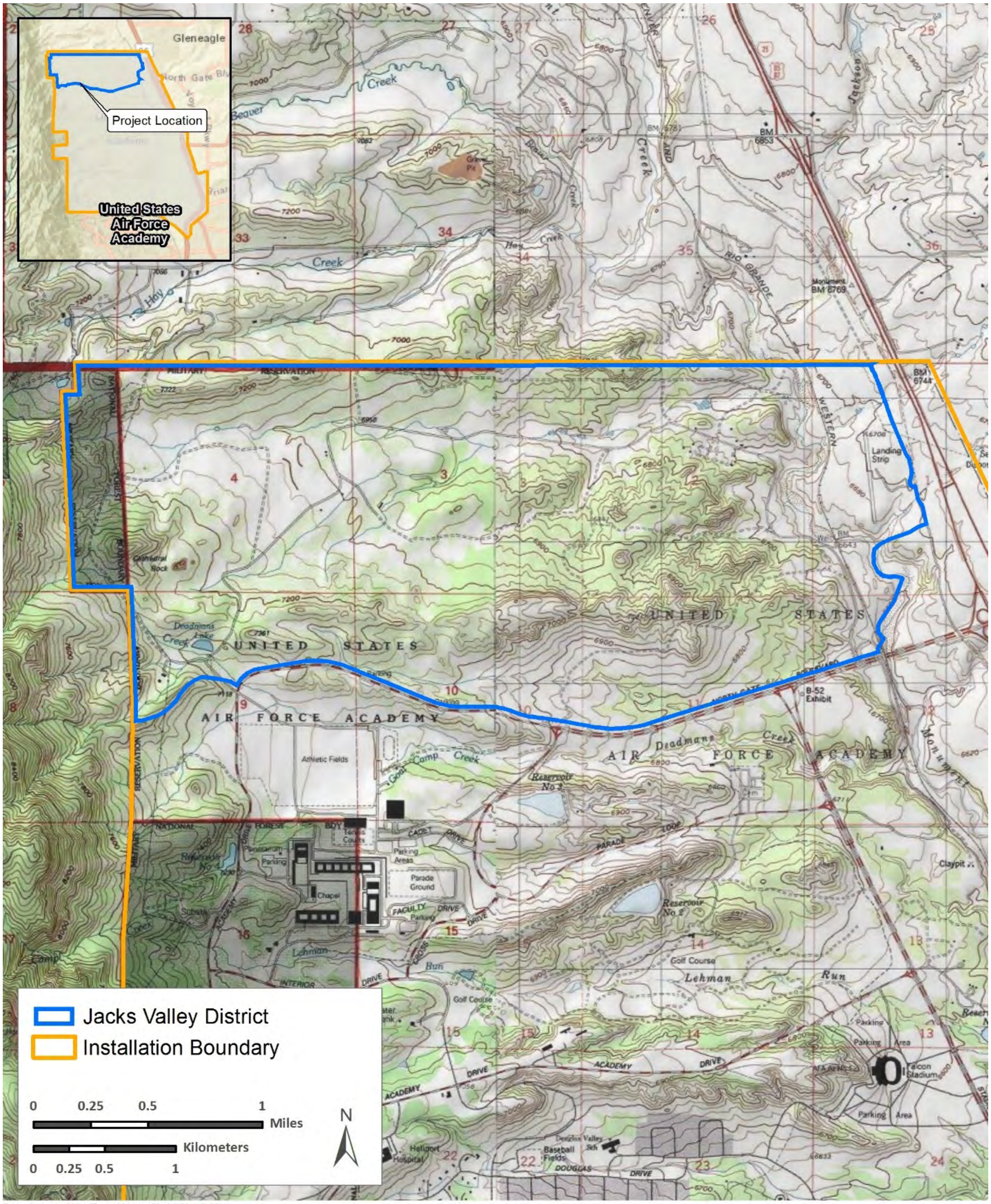
Master planning is required by USAF and the Department of Defense (DoD) to ensure the continual success and effectiveness of their installations. Master planning is essential to an installation’s mission capacity and readiness capability because it promotes regulated real property development. In accordance with master planning requirements, District Plans are developed to establish a high-level outlook of real property investment over the next 20 years, focusing on a particular district within an installation. The District Plan builds on previous planning efforts, policies, strategic and operation visions, and mission requirements to become a guiding document for all future physical and programmatic decisions.

USAFA completed a District Plan for the Jacks Valley district of USAFA in September 2020 (USAF 2020). The JVDP was developed in accordance with Unified Facilities Criteria (UFC) 2-100-01, *Installation Master Planning*, and highlights the ideal outcome of real property development for the Jacks Valley district. The JVDP identifies site-specific issues and opportunities and provides guidance for future development and capital improvements.

The JVDP provides a comprehensive planning framework to identify future priority requirements and goals for base development to ensure successful operations, adequate support capacity, and continued ability of the base to support its assigned mission sets. Ideal development principles for maximizing USAFA’s long-term capabilities are identified in the Strategic Vision Alignment section of the JVDP. The JVDP Planning Constraints, together with the Installation Capacity Opportunities, identify areas suitable for future development. Planning activities must integrate the NEPA process to ensure that planning and decisions reflect environmental values, to identify alternatives considered, to document which alternatives would be carried forward for full analysis and the rationale for those dismissed, to avoid delays later in the process, and to head off potential conflicts.

1.3 Project Location

Jacks Valley, one of eight districts that make up USAFA, is in the northernmost part of the main installation, as shown in **Figure 1-2**. Jacks Valley is bordered to the west by the mountainous Pike and San Isabel National Forests owned by the U.S. Department of Agriculture (USDA) Forest Service and to the north by private development. The Santa Fe Trail and Interstate 25 (I-25) run along Jacks Valley’s eastern edge and provide a distinct border between USAFA and the local communities to the east. USAFA’s North Gate Boulevard, which later becomes Academy Drive as the boulevard runs westward, defines Jacks Valley’s southern border (USAF 2020).



1 Data Source: USA Topo Maps; World Street Map

2 **Figure 1-2. Jacks Valley within USAFA**

Today, Jacks Valley consists of over 3,000 ac for cadet field training. While the cadet training requirement remains static, Jacks Valley has evolved to support training for various external organizations as well. However, because of the sensitive nature of USAFA's training missions, public access to Jacks Valley is restricted and secured by gates at Jacks Valley Road and Providence Way. The Jacks Valley district contains the following six distinct mission and training areas: Basic Cadet Training (BCT) area, Combat Arms Training and Maintenance (CATM) area, Field Engineering Readiness Laboratory (FERL) area, munitions storage area (MSA), Aardvark area, and Prisoner of War (POW) camp area (USAF 2020).

1.3.1 Basic Cadet Training Area

The 250 ac BCT area is in the east-central portion of Jack's Valley. BCT supports training for new cadets in a field encampment environment. One of the largest training areas in Jacks Valley, it includes a cantonment area that houses a dining hall, medical facility, latrines, storage facilities, and concrete pads for tent sleeping quarters. Near the cantonment area is an explosive ordnance disposal pit; a chemical, biological, radiological, and nuclear explosives (CBRNE) training facility; and instruction spaces for many different training courses, including an obstacle course, an assault course, a land navigation course, a confidence course, and a leadership reaction course. Typically, all new cadets spend 2 weeks of their summer initiation in the BCT area. As many as 4,000 cadets pass through the BCT area every year. In the off season, the encampment is used for training exercises by cadets and outside organizations (USAF 2020).

1.3.2 Combat Arms Training and Maintenance Area

CATM supports live-fire training and includes a pistol range, a rifle range, two armories, classrooms, support facilities, and a course for military operations in urban terrain. Although CATM facilities are in a relatively small area in western Jacks Valley, the surface danger zone (SDZ) created by the live-fire ranges encompasses most of the western portion of the district. CATM supports weapons training and qualification for USAFA personnel, BCT, and cadet summer training programs, including Expeditionary Survival and Evasion Training. As one of three military installations on the Front Range in Colorado with firing ranges, CATM supports weapons training and qualification requirements for other DoD units. It also supports weapons training for non-USAF organizations, such as federal agencies and emergency responders in the region (USAF 2020).

1.3.3 Field Engineering Readiness Laboratory Area

FERL is part of USAFA's Department of Civil and Environmental Engineering and provides cadets with hands-on experience in surveying and construction methods, materials, and equipment. Facilities include sleeping quarters, a kitchen and dining facility, storage facilities for equipment and materials, support facilities, classrooms, and hands-on training areas (USAF 2020).

1.3.4 Munitions Storage Area

MSA is a restricted-access area that consists of four ammunition storage magazines as well as a munitions maintenance and administration facility. The MSA also serves as a temporary hazardous materials storage area for materials in transit. Depending on the type and amount of materials, certain areas of Jacks Valley are off limits while the MSA is being used for hazardous materials storage (USAF 2020).

1.3.5 Aardvark Area

The Aardvark area is in the easternmost part of Jacks Valley. It includes the closed Aardvark Airfield, unmanned aerial system takeoff and landing sites, and support trailer. Monument Creek and a railroad easement cut through Jacks Valley north to south, isolating the Aardvark area from the rest of Jacks Valley. Currently, the only access to the Aardvark area is from the east along an unmarked road outside of USAFA's fence line (USFA 2020).

1.3.6 Prisoner of War Camp Area

The POW camp area includes facilities constructed during the Cold War era that simulated an enemy encampment and provided realistic, confidence-building training for future pilots who might be shot down and captured. Use of the site has since ceased, and facilities have been vacated. However, the area still retains historical value, and access to the site is restricted (USAF 2020).

1.4 Purpose of the Proposed Action

The district planning process provides a comprehensive planning framework to identify future priority requirements and goals for development to ensure successful operations, adequate support capacity, and continued ability of the base to support its assigned mission sets. In accordance with the JVDP, the purpose of district development within Jacks Valley is to develop Jacks Valley into a well-connected, safe and secure, premier cadet training site with multipurpose, collaborative spaces, and maximized natural open spaces.

1.5 Need for the Proposed Action

District development within Jacks Valley is needed to provide and maintain facilities and infrastructure that are adequate to support USAFA, and to do so in a manner that:

- Supports USAF mission requirements and future mission capabilities requirements;
- Meets applicable DoD installation master planning criteria consistent with UFC 2-100-01, *Installation Master Planning*, and USAF comprehensive planning policy and directives;
- Meets all applicable DoD, federal, state, and local laws and regulations, including, but not limited to, the Endangered Species Act (ESA), National Historic Preservation Act (NHPA), Clean Water Act (CWA), Clean Air Act, Resource Conservation and Recovery Act, and Migratory Bird Treaty Act (MBTA).

In summary, the district development within Jacks Valley is needed to support USAFA capabilities for cadet training, to provide flexibility for future training requirements, and to improve efficiency of infrastructure and training venues within Jacks Valley while protecting cultural and natural resources.

1.6 Projects Proposed for District Development

Twenty-eight projects are proposed for district development within Jacks Valley at USAFA. This EA assumes that all projects could occur within the next 5 years and treats each project as a discrete Proposed Action. **Table 1-1** lists these projects by category and identifies them by the Project Identification (ID) used in the JVDP. **Section 2.3** describes each project in detail. **Figures 2-1** and **2-2** show the locations of the projects.

Table 1-1. Jacks Valley District Development Projects included as Proposed Actions

Project ID	Project Name	Description of Project
Facility Construction and Demolition		
D	Construct Regional Indoor Firing Range	Construct and operate an indoor firing range with 35 firing positions for weapons qualification.
H	Construct Classroom Addition to Building 1021	Construct an addition to the CATM facility to provide a 70-person classroom.
M	Construct FERL Storage Facility	Construct additional storage capacities in FERL driven by mission requirements.
R	Construct All-Terrain Vehicle (ATV) Storage Facility	Construct facility to store up to 40 ATVs with vehicle charging stations and hardstand. Includes demolition of Building 1068.
T	Construct Consolidated BCT Facility	Construct facility to provide a medical clinic, administrative space, indoor classroom space, drill pad, and accessible parking. Includes demolition of Buildings 1040, 1070, 1075, and 1099.
U	Construct Dining Facility Storage	Construct facility with dry, refrigerated, and freezer storage space and a loading dock.
Z	Construct Four Training Course Restrooms	Construct restrooms at the leadership reaction course and restrooms to be shared by the assault course and obstacle course.
AA	Construct CBRNE Facility	Construct and operate a gas training facility with overhead cover for instruction.
Land Modification		
E	Baffle CATM Ranges	Install baffles at the CATM ranges to remove the existing SDZs.
N	Construct Counter Improvised Explosive Device (IED) Identification Training Course	In the area proposed for the IED course, install a storage facility, and install overhead cover for the course instruction area.
W	Construct Rappelling Tower	Install a rappelling tower on the field within the existing track.
X	Construct Drainage Improvements at the Assault Course and Obstacle Course	Improve drainage at the water obstacles by doing land grading and constructing drainage swales.
AE	Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements	Implement best management practices (BMP) across the district to provide for better erosion control and stormwater management.
Roads and Trails Improvements		
C	Construct North/South Connector Roads	Construct connector roads to deter creation of off-road trails.
J	Construct CATM Bypass Road	Construct a bypass road as a safety requirement to direct traffic around the CATM Complex.
K	Construct FERL Parking Lot	Construct a FERL parking lot to provide 60 parking spaces.

Project ID	Project Name	Description of Project
L	Construct FERL Road Improvements	Repair existing FERL roads that have deteriorated.
O	Return Unused Roads to Natural Condition	Break up existing dirt roads west of the MSA and east of the confidence course and mix in topsoil for plantings.
S	Improve the Existing BCT Parking Lot	Improve the existing BCT parking lot and install lighting along the parking lot perimeter and sidewalks.
AG	Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard	Construct an unpaved surface on the side of the existing roadways.
Utilities and Communications Installation		
G	Provide Jacks Valley District Wi-Fi Infrastructure	Install communications lines within existing disturbed areas to provide Wi-Fi to cadets and instructors in Jacks Valley.
AF	Provide Geofencing with Closed Circuit Television and Intrusion Detection Systems	Install geofencing with electronic barriers that provide for closed-circuit television capabilities and intrusion detection systems.
AH	Loop the Jacks Valley District Water Supply Line	Increase water availability in Jacks Valley while also supplying water in an efficient manner.
Renovations		
A	Repurpose Buildings 1002 and 1006; Repurpose and Renovate Buildings 1000, 1003, and 1004	Transfer existing POW camp facilities to be used for USAF Combatives Center of Excellence mission requirements.
F	Install Bleacher Covers at the CATM Ranges	Provide overhead cover for the course instruction area at both ranges.
P	Renovate and Construct Addition to Building 1072, Training Storage Warehouse	Renovate the existing warehouse area and construct an addition that provides an administrative facility, restroom, storage space, and a hardstand area.
Q	Renovate Building 1069	Renovate the training storage warehouse for ATV maintenance, to include vehicle lifts.
Y	Renovate BCT Entry Control Point, Building 1062	Renovate/repair existing guard shack, add restroom and ID check canopy, and provide electronic entry system.

1.7 Environmental Analysis Approach and Methodology

The USAF initially identified 34 projects in the JVDP (USAF 2020) for environmental analysis that are related to the different categories of activities considered and geographic areas associated with Jacks Valley. The proposed projects are focused on future development activities and priorities of the installation as established by the JVDP during mission planning. Six projects listed in the JVDP were not included in this EA; five of these projects were identified as priority projects prior to development of the JVDP and have already been reviewed under the EIAP, and one of these projects was considered not currently viable after additional project review. Any additional projects or future activities proposed in areas associated with Jacks Valley must be evaluated on their own merit under the USAF EIAP guidelines to determine their environmental impacts and the appropriate level of NEPA analysis.

1.7.1 Elements of the Proposed Action Dismissed from Further Environmental Analysis

Due to the nature of the actions, it can be determined without additional analysis that 9 of the 28 projects presented in **Table 1-1** would not, individually or cumulatively, have the potential for significant effects on human health and the environment. **Table 1-1** included these projects as Proposed Actions, but they will not be analyzed further for environmental impacts in the EA due to the nature of the activities. **Table 1-2** identifies those projects that will be dismissed from further environmental analysis. Therefore, 19 projects will be carried forward as Proposed Actions for environmental analysis in the EA.

Table 1-2. Elements of the Proposed Action Dismissed from Further Environmental Analysis

Project ID	Project Title	Reason for Dismissal
Facility Construction and Demolition		
H	Construct Classroom Addition to Building 1021	Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.
Land Modification		
W	Construct Rappelling Tower	Installing on previously developed land, equipment that does not substantially alter land use (i.e., land use of more than 1 ac). This includes outgrants to private lessees for similar construction.
Utilities and Communications Installation		
G	Provide Jacks Valley District Wi-Fi Infrastructure	Installing, operating, modifying, and routinely repairing and replacing utility and communications systems, data processing cable, and similar electronic equipment that use existing rights of way, easements, distribution systems, or facilities.
AF	Provide Geofencing with Closed Circuit Television and Intrusion Detection Systems	Installing, operating, modifying, and routinely repairing and replacing utility and communications systems, data processing cable, and similar electronic equipment that use existing rights of way, easements, distribution systems, or facilities.
Renovations		
A	Repurpose Buildings 1002 and 1006; Repurpose and Renovate Buildings 1000, 1003, and 1004	Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.
F	Install Bleacher Covers at the CATM Ranges	Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.
P	Renovate and Construct Addition to Building 1072, Training Storage Warehouse	Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.
Q	Renovate Building 1069	Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.
Y	Renovate BCT Entry Control Point, Building 1062	Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.

1.8 Purpose of and Need for Individual Proposed Actions

As individual Proposed Actions, each of the projects in this EA have a specific purpose and need. The purpose of and need for each of the projects considered for environmental analysis is presented in **Table 1-3**.

Table 1-3. Purpose of and Need for Each Jacks Valley District Development Project

Project ID	Project Name	Purpose	Need
Facility Construction and Demolition			
D	Construct Regional Indoor Firing Range	Provide a permanent, purpose-built facility to allow for year-round training conditions.	The current range is outdoors, and trainings are restricted by weather conditions.
M	Construct FERL Storage Facility	Provide better storage capacities in FERL.	Current storage is lacking, in accordance with mission requirements.
R	Construct ATV Storage Facility	Provide better ATV storage capabilities.	Current storage does not provide enough space, or the capabilities, to store and charge ATVs and other equipment.
T	Construct Consolidated BCT Facility	Provide a single consolidated space to meet BCT requirements.	Existing BCT facilities are disjointed and do not allow for efficient training and instruction.
U	Construct Dining Facility Storage	Provide additional storage space for dry, refrigerated, and freezer goods near the dining facility.	There is currently not enough space to store dining goods in Jacks Valley.
Z	Construct Four Training Course Restrooms	Improve current conditions in Jacks Valley to enhance cadet training and make it a more holistic, self-sufficient training area.	Current restroom facilities and the facility locations do not support the current throughput of cadets using the training courses.
AA	Construct CBRNE Facility	Provide a permanent, purpose-built, and larger facility to enhance training.	The current configurations for gas training are semi-permanent and are inadequate to support continued training.
Land Modification			
E	Baffle CATM Ranges	Remove existing SDZs and reduce impacts on the Cathedral Rock cultural resources area.	This is a safety requirement to remove the SDZs. Additionally, the current small arms firing has the potential to impact the Cathedral Rock cultural resources area.
N	Construct Counter IED Identification Training Course	Improve training capabilities for cadets using Jacks Valley.	There is currently not a dedicated location for counter IED training that can support the throughput of cadets.
X	Construct Drainage Improvements at the Assault Course and Obstacle Course	Improve drainage at the assault and obstacle courses to limit flooding and stormwater runoff.	The training courses would be able to support training year-round.
AE	Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements	Establish better flow of water through Jacks Valley to provide better stormwater management.	Flooding during heavy precipitation events currently occurs and results in erosion issues.

Project ID	Project Name	Purpose	Need
Roads and Trails Improvements			
C	Construct North/South Connector Roads	Improve current navigation through Jacks Valley.	The roads in Jacks Valley currently require additional travel through areas that could otherwise be avoided with more direct routes.
J	Construct CATM Bypass Road	Direct traffic around the CATM Complex.	This is a safety requirement to protect cadets using CATM.
K	Construct FERL Parking Lot	Improve current parking conditions to support cadet training capabilities and needs.	The current parking lot is eroded and unlevel, which is unsafe and contributes to sedimentation in stormwater runoff.
L	Construct FERL Road Improvements	Improve current road conditions to support cadet training capabilities and needs.	These roads are damaged and require maintenance for safety and continued use.
O	Return Unused Roads to Natural Condition	Allow for maintenance of naturalized open space in Jacks Valley.	The natural conditions would further the goal of maintaining naturalized open space in Jacks Valley.
S	Improve the Existing BCT Parking Lot	Improve current conditions to support cadet training capabilities and needs.	The current parking lot is eroded and unlevel, and does not have lighting or a sidewalk. These conditions are unsafe and lead to sedimentation in stormwater runoff from the parking lot.
AG	Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard	Provide safer conditions for cadets exercising and moving between Jacks Valley and the rest of USAFA.	Cadets currently have no safe access/exercise trail along these roads.
Utilities and Communications Installation			
AH	Loop the Jacks Valley District Water Supply Line	Increase water availability in Jacks Valley while also supplying water in an efficient manner.	The water supply is currently not in a looped system, reducing water availability.

1.9 NEPA and Other Compliance Requirements

NEPA is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before those actions are taken. NEPA helps decision makers make well-informed decisions that are based on an understanding of the potential environmental consequences. NEPA established the CEQ, which is charged with developing implementing regulations and ensuring federal agency compliance with NEPA. The process for implementing NEPA is outlined in 40 CFR Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

CEQ regulations specify that an EA be prepared to provide evidence and analysis for determining whether to prepare a FONSI or an EIS. The EA aids in an agency's compliance with NEPA when an EIS is unnecessary and facilitates preparation of an EIS when one is required.

Air Force Policy Directive 32-70, *Environmental Considerations in Air Force Programs and Activities*, states that USAF will comply with applicable federal, state, and local environmental laws and regulations, including NEPA. USAF's implementing regulation for NEPA is the EIAP, 32 CFR Part 989.

In compliance with NEPA, this EA determines whether the Proposed Actions would result in significant impacts. This EA will be used to guide USAF in implementing the Proposed Actions in a manner consistent with USAF standards for environmental stewardship should the Proposed Actions be approved for implementation.

USAF is required to manage floodplains and wetlands in accordance with Air Force Manual 32-7003, *Environmental Conservation*, which includes the USAF guidance for compliance with EO 11988, *Floodplain Management*, and with EO 11990, *Protection of Wetlands*. USAF has identified one project under the Proposed Action, Project O, that would have the potential to disturb floodplains; additional information is provided in **Section 2.1**.

1.10 Interagency/Intergovernmental Coordination and Consultations

1.10.1 Interagency Coordination and Consultations

NEPA requirements help ensure that environmental information is made available to the public during the decision-making process and prior to actions being taken. Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and for identifying significant concerns related to a proposed action. In accordance with the Intergovernmental Cooperation Act of 1968 (42 United States Code [USC] § 4231(a)) and EO 12372, *Intergovernmental Review of Federal Programs*, as amended by EO 12416 with the same title, federal, state, and local agencies with jurisdiction that could be affected by the Proposed Actions have been notified during the development of the EA. **Appendix A** contains the list of agencies consulted during this analysis.

1.10.2 Government to Government Consultations

NHPA implementing regulations at 36 CFR Part 800 require federal agencies to consult with federally recognized tribes historically affiliated with the area of potential effects (APE) for the project to determine the presence of, and resolve adverse effects on, traditional cultural properties (TCP). Consistent with NHPA implementing regulations, DoD Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes*, and Air Force Instruction (AFI) 90-2002, *Interactions with Federally Recognized Tribes*, federally recognized tribes that are historically affiliated with the USAFA geographic region were invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation and the interagency coordination process, and it requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The Native American tribal governments that were coordinated or consulted with regarding these actions are listed in **Appendix A**.

1.10.3 Other Agency Consultations

In accordance with Section 106 of the NHPA and implementing regulations (36 CFR Part 800), findings of effect and requests for concurrence were transmitted to the Colorado State Historic Preservation Officer (SHPO). In accordance with Section 7 of the ESA and implementing regulations, USAF has determined the Proposed Actions would have no effect and coordinated with the U.S. Fish and Wildlife Service (USFWS) on this finding.

1.11 Public and Agency Review of EA

Because the Proposed Action area coincides with floodplains, it is subject to the requirements and objectives of EO 11988, *Floodplain Management*. On June 5, 2021, USAF published in the newspapers of record (identified below) an early notice that one of the Proposed Actions would occur in a floodplain. The notice informed federal and state regulatory agencies with special expertise and solicited public and agency comment on the Proposed Actions and any practicable alternatives. No comments were received, although USFWS and Colorado Parks and Wildlife acknowledged the receipt of the early notice.

A Notice of Availability (NOA) of the Draft EA and FONSI (including FONPA statement) are being published in the newspapers of record (identified below), announcing the availability of the Draft EA for review. The NOA invites the public and agencies to review and comment on the Draft EA.

The early notice of project execution in a floodplain and the NOA were published in the following newspapers: *Colorado Springs Gazette* and *Our Community News.* Copies of the Draft EA are also being sent to local libraries. Public and agency comments on the Draft EA will be considered prior to a decision being made on whether or not to sign a FONSI (including FONPA statement).

1.12 Decision to be Made

This EA evaluates whether the Proposed Actions would result in significant impacts on the human environment. If significant impacts are identified, USAFA would undertake mitigation to reduce impacts to below the level of significance, prepare an EIS addressing the Proposed Actions, or abandon the Proposed Actions. The EA is a planning and decision-making tool that will be used to guide USAFA in implementing the Proposed Actions in a manner consistent with USAF standards for environmental stewardship.

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2. Description of the Proposed Actions and Alternatives

This section describes the Proposed Actions and alternatives considered, including the No Action Alternatives. As discussed in **Section 1.9**, the NEPA process evaluates potential environmental consequences associated with a Proposed Action. The NEPA process also considers alternative courses of action; reasonable alternatives must satisfy the purpose of and need for the Proposed Actions, as defined in **Sections 1.4, 1.5,** and **1.8**, and the selection standards described in **Section 2.2.1**. The USAF NEPA regulations specify the inclusion of a No Action Alternative against which potential effects can be compared. In addition, CEQ guidance recommends inclusion of the No Action Alternative in an EA to assess any environmental consequences that may occur if the Proposed Action is not implemented. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in accordance with the USAF NEPA regulations.

2.1 Proposed Actions

This EA presents the 19 projects selected from the JVDP for environmental analysis as the Proposed Actions (see **Section 1.8, Table 1-3**). This document treats each project as a discrete Proposed Action and evaluates each project separately. In summary, the Proposed Actions include the following types of activities:

- Facility construction and demolition
- Land modification
- Roads and trails improvements
- Utilities and communications installation

This EA assumes that all projects could occur within the next 5 years. **Figures 2-1** and **2-2** show the notional locations of the 19 projects within Jacks Valley. The figures in this EA show the mission and training areas in Jacks Valley (BCT area, CATM area, FERL area, MSA area, Aardvark area, and POW camp area) as distinct district planning areas with boundaries to help the reader understand the extent of where development has occurred or could occur within those areas. The BCT area is broken down into the BCT developed area, which houses existing facilities and infrastructure, and the broader BCT training area, which includes the developed area and existing training courses.

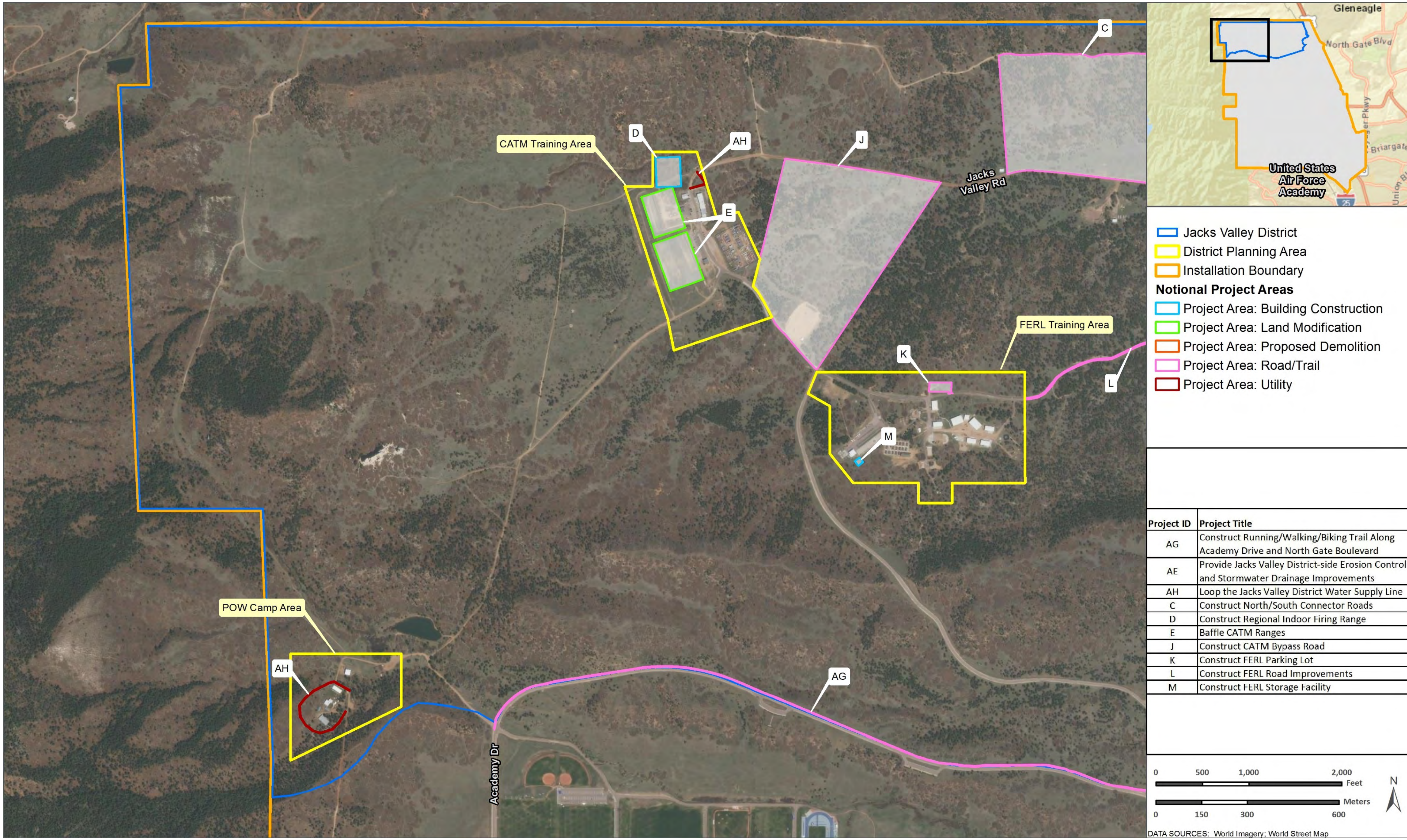
Sections 2.3.1 through **2.3.4** provide additional details regarding each Proposed Action and its proposed location. Detailed figures of the proposed locations of the 19 projects are provided in **Appendix B**. The exact locations of the proposed projects could shift within the constraints of the environmental effects analysis presented in this EA; based on engineering, environmental, or design limiting factors; and based on input from SHPO during the project-specific consultation processes. The Proposed Actions and potential areas of disturbance are summarized in **Section 2.3.5**.

2.2 Selection of Alternatives

2.2.1 Selection Standards for Project Alternatives

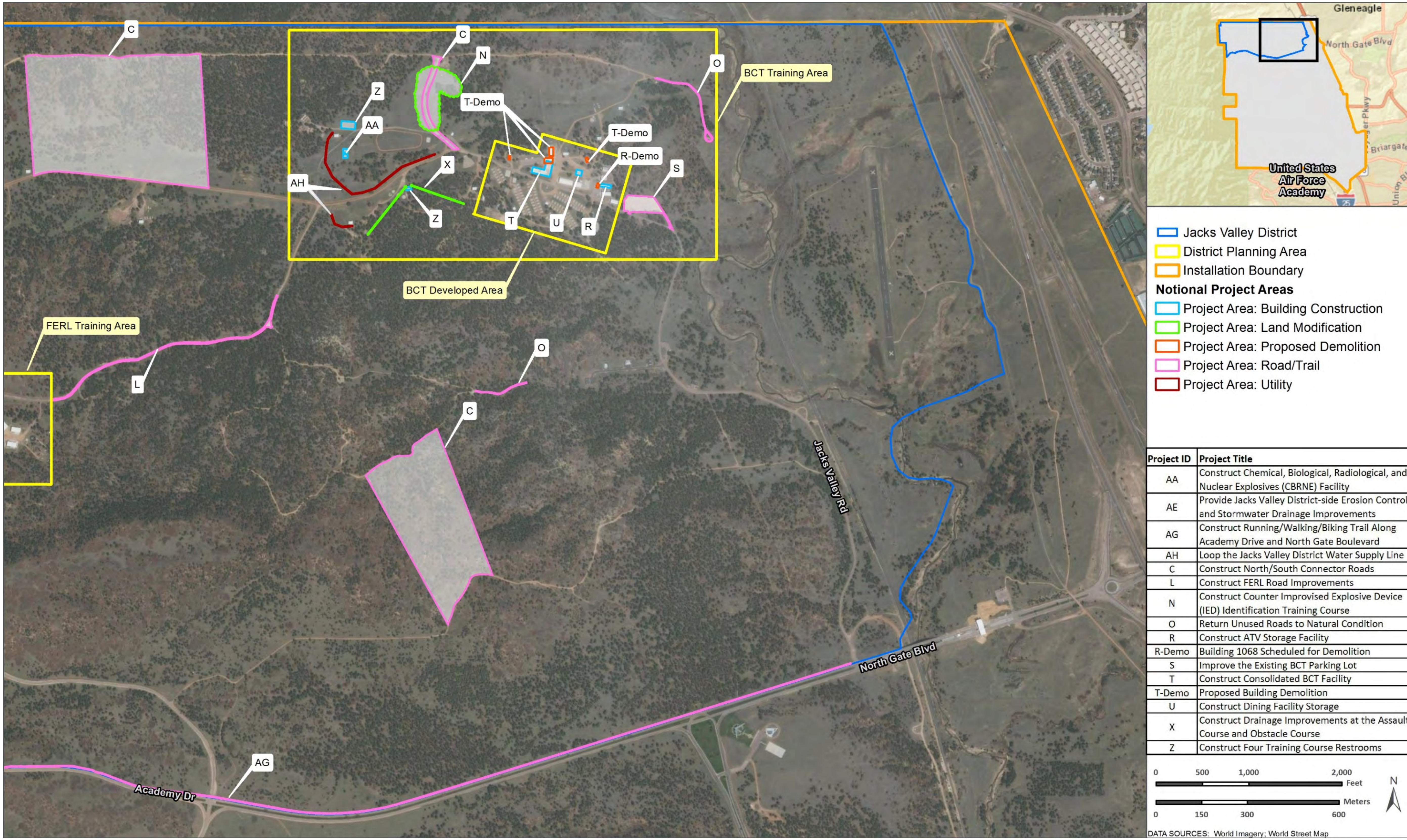
The scope and location of each Proposed Action and, where applicable, its alternatives underwent extensive review by USAFA Civil Engineering Squadron personnel, local government agencies, and supporting installation and USAF staff specialists during the JVDP planning process. Potential alternatives to each Proposed Action were evaluated based on three universal selection standards. Each project description in **Section 2.3** provides details regarding how these selection standards apply to specific project requirements. In accordance with USAF and DoD master planning requirements, district planning includes consideration of the following specific planning components as universal selection standards: Planning Constraints, Capacity Opportunities, and Sustainability Development Indicators. These standards are defined as follows:

- **Standard 1, Planning Constraints:** Human-made or natural elements that can create significant limitations to the operation or construction of buildings, roadways, utility systems, airfields, training ranges, and other facilities. These constraints, when considered collectively with the installation's capacity opportunities, inform the identification of potential areas for development, as well as those areas that can be redeveloped to support growth. This selection standard addresses compatibility with installation operational aspects, natural and built resources, and land use compatibility, as follows, and largely dictates the location and placement of a proposed facility:
    - Operational and mission – Operational constraints are generally related to operating aircraft; storing fuel, munitions, and other potentially hazardous cargo; and operating training ranges or fulfilling similar operational requirements that can limit future development activity.
    - Natural – Natural constraints include environmental and cultural resources within Jacks Valley. These provide positive aesthetic, social, cultural, and recreational attributes that substantially contribute to the overall quality of training within Jacks Valley.
    - Built – Built constraints are related to the condition, functionality, or effectiveness of infrastructure systems, facilities, and other human-made improvements.
    - Land Use Compatibility – Land use compatibility constraints are associated with land use designations (e.g., airfield, administrative, recreation) on the installation and ensure that planning considerations account for compatibility between proposed and existing uses (e.g., recreational use may not be compatible with the airfield).



Project ID	Project Title
AG	Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard
AE	Provide Jacks Valley District-side Erosion Control and Stormwater Drainage Improvements
AH	Loop the Jacks Valley District Water Supply Line
C	Construct North/South Connector Roads
D	Construct Regional Indoor Firing Range
E	Baffle CATM Ranges
J	Construct CATM Bypass Road
K	Construct FERL Parking Lot
L	Construct FERL Road Improvements
M	Construct FERL Storage Facility

Figure 2-1. Notional Proposed Development within Jacks Valley – West



Project ID	Project Title
AA	Construct Chemical, Biological, Radiological, and Nuclear Explosives (CBRNE) Facility
AE	Provide Jacks Valley District-side Erosion Control and Stormwater Drainage Improvements
AG	Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard
AH	Loop the Jacks Valley District Water Supply Line
C	Construct North/South Connector Roads
L	Construct FERL Road Improvements
N	Construct Counter Improvised Explosive Device (IED) Identification Training Course
O	Return Unused Roads to Natural Condition
R	Construct ATV Storage Facility
R-Demo	Building 1068 Scheduled for Demolition
S	Improve the Existing BCT Parking Lot
T	Construct Consolidated BCT Facility
T-Demo	Proposed Building Demolition
U	Construct Dining Facility Storage
X	Construct Drainage Improvements at the Assault Course and Obstacle Course
Z	Construct Four Training Course Restrooms

Figure 2-2. Notional Proposed Development within Jacks Valley – East

- **Standard 2, Capacity Opportunities:** The capabilities of the existing facilities and infrastructure to meet existing and future mission needs. This largely drives the scope of the facility or infrastructure development and/or improvement and requires that proposed facility or infrastructure development and improvements support the following aspects: mission operations, mission support, built infrastructure, and quality of life.

- **Standard 3, Sustainability Development Indicators:** The ability to operate into the future without a decline in either the mission or the natural and human-made systems that support it, creating sustainable installations or districts. Sustainability is a holistic approach to asset management that seeks to minimize the negative impacts of the USAF's mission and operations on the environment. This selection standard also drives the scope of facility and infrastructure development and improvement and supports sustainability and resiliency of the installation through consideration of energy, water, wastewater, air quality, facilities space optimization, encroachment, airfields, natural and cultural resources, restoration sites, petroleum products, hazardous materials, solid and hazardous waste, and toxic substances.

These planning component universal selection standards were also used during the JVDP planning process to identify specific standards against which potential district development project alternatives could be considered. The following selection standards were identified in the JVDP for district development project alternatives:

- Provide for safe and secure training
- Create multipurpose collaborative spaces
- Maximize natural open spaces
- Promote or increase accessibility and connectivity

In accordance with the 2020 CEQ revised guidelines for implementing NEPA (40 CFR Parts 1500–1508), specifically 40 CFR § 1501.12, *Incorporation by Reference*, and with the intent of reducing the size of this document, paperwork, and project delays, this EA incorporates by reference the extensive review and consideration of project alternatives presented in the JVDP. Additional information on the alternatives development, review, and selection process is available in the 2020 JVDP at https://www.usafa.af.mil/Units/10th-Air-Base-Wing/Mission-Support-Group/Civil-Engineer-Squadron/Installation-Management/Environmental-Management/.

2.2.2 Consideration of Location Alternatives

Prior to development of the purpose and need and the Proposed Actions, USAF reviewed strategic requirements for BCT and considered whether BCT could be replicated in another location or split between Jacks Valley and another location. Regional locations considered as part of this strategic review process included Fort Carson and adjacent USDA Forest Service land.

2.2.2.1 FORT CARSON

The U.S. Army Installation Fort Carson is south of Colorado Springs in El Paso, Pueblo, and Fremont Counties, Colorado. Fort Carson could be used for BCT activities because of its proximity to USAFA and availability of multiple training areas. However, due to the year-round active army training schedule at Fort Carson, USAFA would have difficulty scheduling events around the existing Army training. Additionally, cadets would have to be driven to Fort Carson for training, requiring additional time and expenses. Therefore, USAFA determined that implementing BCT at Fort Carson would not adequately support BCT.

2.2.2.2 USDA FOREST SERVICE LAND

USAFA has a special use permit for conducting Adventure-Based Experiential Learning (ABEL) on USDA Forest Service land adjacent to the USAFA western boundary. The ABEL program is a USAFA training program that is separate from the BCT program and is to train cadets in peer and team leadership, risk management, and strategic thinking. The USDA Forest Service special use permit allows for nine separate training events during 10-day periods. However, the special use permit is granted for a specific type of training, with a limited number of training days and within a limited training window, and the permit includes management practices specific to the type of training described in the permit. Therefore, USAFA determined that implementing BCT on USDA Forest Service land under the existing special use permit would not adequately support BCT.

2.3 Proposed Action and Alternatives

The USAF and CEQ regulations address the consideration of reasonable alternatives to proposed action(s). Considering alternatives helps to avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. “Reasonable alternatives” are those that meet the purpose of and need for a proposed action, among other requirements.

The NEPA process is intended to support flexible, informed decision-making; the analysis provided in the EA and feedback from the public and agencies will inform decisions made about whether, when, and how to execute the Proposed Actions. Among the alternatives evaluated for each project is a No Action Alternative. The No Action Alternative allows USAF to substantively analyze the consequences of not undertaking the Proposed Action rather than to simply conclude no impact and serves to establish a comparative baseline for analysis.

The scope, location, and objectives of the Proposed Actions are described here, grouped by project category. This section also presents consideration of reasonable and practicable alternatives for individual projects where multiple viable courses of action could exist. Those alternatives are assessed relative to the selection standards described in **Section 2.2.1**. Alternatives that met all three selection standards were considered reasonable and retained for consideration in the EA. Alternatives that did not meet one or more of the standards were considered unreasonable and are not retained for consideration in the EA. **Appendix B** provides individual figures for the proposed location of each Proposed Action.

2.3.1 Facility Construction and Demolition

Seven facility construction projects have been identified for analysis in the EA (see **Table 2-1** and **Figures 2-1** and **2-2**). These projects would occur in CATM, FERL, and the BCT training areas of Jacks Valley. These projects would result in approximately 85,060 square feet (sq ft; 2.0 ac) of ground disturbance. Additionally, five existing facilities occur within the proposed project areas and would be demolished.

Table 2-1. Facility Construction and Demolition Proposed within Jacks Valley

Project ID	Project Title	Approximate Size of Disturbance (sq ft)	Project Location
D	Construct Regional Indoor Firing Range	30,625	CATM
M	Construct FERL Storage Facility	4,000	FERL
R	Construct ATV Storage Facility	3,360	BCT
T	Construct Consolidated BCT Facility	38,815	BCT
U	Construct Dining Facility Storage	3,300	BCT
Z	Construct Four Training Course Restrooms	960	BCT
AA	Construct CBRNE Facility	4,000	BCT
	Total	**85,060**	

2.3.1.1 PROJECT D: CONSTRUCT REGIONAL INDOOR FIRING RANGE

The Proposed Action is to construct a regional indoor firing range in a previously undeveloped but partially disturbed location in the CATM training area of Jacks Valley. The 30,625 sq ft building would be used for weapons qualifications for USAFA cadets, the 10th Security Forces Squadron at USAFA, and other local installations. No anticipated increase in training throughput would occur once construction is complete; the current level of small arms training would be continued in this new facility or split between this new facility and the existing outdoor range. The regional indoor firing range would contain 35 firing positions and would be constructed to support the firing of small arms rounds. **Figure 2-1** shows the proposed siting location of the indoor firing range in the CATM training area.

Alternatives Considered but Eliminated from Analysis in the EA. This project would be sited within the area identified in the JVDP as "developable" in the CATM training area. Siting alternatives outside of the CATM training area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would infringe on outdoor training land, would require utilities to be extended greater distances, and would increase the potential for environmental impacts. One additional alternative was considered that included replacing the existing outdoor ranges with an indoor-only range; however, this alternative was dismissed because it did not meet the Capacity Opportunities selection standard to support mission operations and provide cadets with the opportunity to train in outdoor environments.

Alternatives to be Analyzed in the EA for Project D. The following alternatives are carried forward for analysis in the EA:

- **Project D (Preferred Alternative):** USAF would implement the described Proposed Action for Project D, to construct the indoor firing range in the CATM training area of Jacks Valley.
- **Project D1 Alternative:** Under the D1 Alternative, USAF would construct the indoor firing range in the CATM training area of Jacks Valley, south of the existing outdoor ranges. The facility would be approximately 30,625 sq ft and would be used as

described under the Project D Proposed Action. **Figure 2-3** shows the proposed siting location of the indoor firing range in the CATM training area under the D1 Alternative.

- **No Action Alternative for Project D:** Under the No Action Alternative, Project D would not be constructed, and the outdoor firing range would solely be used for small arms training. Training qualifications would continue to be affected by adverse weather conditions.

2.3.1.2 PROJECT M: CONSTRUCT FERL STORAGE FACILITY

The Proposed Action is to construct an approximately 4,000 sq ft FERL storage facility. The facility would be sited within the developed FERL training area, and **Figure 2-1** shows a notional site layout for the facility. This facility would be used to provide additional storage space for various FERL equipment.

Alternatives Considered but Eliminated from Analysis in the EA. The facility would be constructed in the existing developed FERL training area to minimize potential environmental impacts and to provide a close functional relationship to other FERL facilities and facilities with similar storage functions. Siting alternatives outside of the FERL training area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would infringe on outdoor training land, would not provide the close functional relationship to FERL training activities, would require utilities to be extended greater distances, and would increase the potential for environmental impacts.

Alternatives to be Analyzed in the EA for Project M. The following alternatives are carried forward for analysis in the EA:

- **Project M (Preferred Alternative):** USAF would implement the described Proposed Action for Project M, to construct the FERL storage facility in the FERL training area.
- **No Action Alternative for Project M:** Under the No Action Alternative, Project M would not be constructed, and adequate storage would not be available for FERL training in accordance with mission requirements.

2.3.1.3 PROJECT R: CONSTRUCT ATV STORAGE FACILITY

The Proposed Action is to construct an approximately 2,240 sq ft ATV storage facility in the BCT developed area of Jacks Valley; **Figure 2-2** shows a notional site layout for the facility. Currently, ATVs are stored in the garage, reducing the ability to bring in vehicles for maintenance or the ability to store other equipment. This project would include demolition of Building 1068 and would result in 1,119 sq ft of temporary disturbance and removal of impervious surfaces.

1 Data Source: World Imagery; World Street Map

2 **Figure 2-3. Notional Site Layout for Project D1 Alternative**

Alternatives Considered but Eliminated from Analysis in the EA. The ATV storage facility would be constructed within the existing developed area of the BCT, adjacent to other ATV maintenance and storage functions and in an area that currently hosts other maintenance/storage facilities. Siting alternatives outside of the BCT developed area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would infringe on outdoor training land, would not provide the close functional relationship to other BCT facilities, would require utilities to be extended greater distances, and would increase the potential for environmental impacts.

Alternatives to be Analyzed in the EA for Project R. The following alternatives are carried forward for analysis in the EA:

- **Project R (Preferred Alternative):** USAF would implement the described Proposed Action for Project R, to construct the ATV storage facility in the BCT developed area.
- **No Action Alternative for Project R:** Under the No Action Alternative, Project R would not be constructed, and adequate storage and capabilities would not be available to support ATV use and maintenance.

2.3.1.4 PROJECT T: CONSTRUCT CONSOLIDATED BCT FACILITY

The Proposed Action is to construct a consolidated BCT facility in the BCT developed area; **Figure 2-2** shows a notional site layout for the facility. This facility would consist of a 32,536 sq ft building and would contain a full medical clinic for 10 medical group personnel, administrative space, indoor classroom space, a drill pad, and accessible parking. This project would include demolition of Buildings 1040, 1070, 1075, and 1099, which would result in 6,279 sq ft of temporary disturbance and removal of impervious surfaces.

Alternatives Considered but Eliminated from Analysis in the EA. The consolidated BCT facility would be constructed in the central portion of the BCT developed area, which currently hosts other administrative and cadet support facilities and is easily accessible. Siting alternatives outside of the BCT developed area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would infringe on outdoor training land, would not provide the close functional relationship to other BCT facilities, would require utilities to be extended greater distances, and would increase the potential for environmental impacts.

Alternatives to be Analyzed in the EA for Project T. The following alternatives are carried forward for analysis in the EA:

- **Project T (Preferred Alternative):** USAF would implement the described Proposed Action for Project T, to construct the consolidated BCT facility in the BCT developed area.
- **No Action Alternative for Project T:** Under the No Action Alternative, Project T would not be constructed, and the developed BCT area would not provide for efficient training and instruction.

2.3.1.5 PROJECT U: CONSTRUCT DINING FACILITY STORAGE

The Proposed Action is to construct a 3,300 sq ft dining facility storage area within the BCT developed area. The facility would be used to store dry, refrigerated, and freezer goods within Jacks Valley to support dining during basic training.

Alternatives Considered but Eliminated from Analysis in the EA. The dining facility storage would be constructed within an existing disturbed footprint of the BCT developed area, immediately adjacent to the dining facility, with room for delivery trucks to maneuver to and from the facility. Siting alternatives outside of the BCT developed area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would increase ground disturbance, would not provide an adequate area for delivery vehicles to maneuver, would infringe on outdoor training land, and would not provide the close functional relationship to the existing dining facility.

Alternatives to be Analyzed in the EA for Project U. The following alternatives are carried forward for analysis in the EA:

- **Project U (Preferred Alternative):** USAF would implement the described Proposed Action for Project U, to construct the dining facility storage in the BCT developed area.
- **No Action Alternative for Project U:** Under the No Action Alternative, Project U would not be constructed, and adequate space to store dining goods for Jacks Valley training would not be available.

2.3.1.6 PROJECT Z: CONSTRUCT FOUR TRAINING COURSE RESTROOMS

The Proposed Action is to construct four restrooms, in two facilities, for cadets within the BCT training area; **Figure 2-2** shows notional locations for the restrooms. Construction of the restrooms would result in 960 sq ft of additional impervious surfaces. The restrooms would support training at the existing leadership reaction course, assault course, and obstacle course, as well as at the proposed IED training course (Project N) and CBRNE facility (Project AA).

Alternatives Considered but Eliminated from Analysis in the EA. The restrooms would be constructed in existing cleared areas immediately adjacent to the courses they are proposed to support within the BCT training area. Siting alternatives outside of the BCT training area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would infringe on existing outdoor training land and habitat, would increase vegetation and habitat clearance, and would not provide the close functional relationship to the existing training courses.

Alternatives to be Analyzed in the EA for Project Z. The following alternatives are carried forward for analysis in the EA:

- **Project Z (Preferred Alternative):** USAF would implement the described Proposed Action for Project Z, to construct the four training course restrooms in the BCT training area, adjacent to the existing training courses.
- **No Action Alternative for Project Z:** Under the No Action Alternative, Project Z would not be constructed, and the existing restrooms would continue to support cadet training.

Restrooms would not provide adequate capacity or location efficiency to support the current throughput of cadets.

2.3.1.7 PROJECT AA: CONSTRUCT CBRNE FACILITY

The Proposed Action is to construct a 4,000 sq ft CBRNE facility in the BCT training area. The facility would be a permanent facility to replace the existing temporary facility and would include an instructional area with overhead cover. **Figure 2-2** shows a notional site layout for the CBRNE facility within the BCT training area.

Alternatives Considered but Eliminated from Analysis in the EA. The proposed facility would be constructed in the BCT training area in a different location than the current temporary facility to avoid impacts on natural resources (specifically wetlands, natural waterways, and critical habitat) while also providing proximity to existing training courses. Siting alternatives outside of the BCT training area would not meet the Planning Constraints (built, land use compatibility) or Sustainability Development Indicators selection standards because such alternatives would not provide the close functional relationship to other training courses or the BCT developed area, and would cause a decline in the natural resources of Jacks Valley.

Alternatives to be Analyzed in the EA for Project AA. The following alternatives are carried forward for analysis in the EA:

- **Project AA (Preferred Alternative):** USAF would implement the described Proposed Action for Project AA, to construct the permanent CBRNE facility in the BCT training area, adjacent to the existing training courses.
- **No Action Alternative for Project AA:** Under the No Action Alternative, Project AA would not be constructed, and the existing temporary CBRNE facility would continue to inadequately support cadet training.

2.3.2 Land Modification

Four land modification projects have been proposed in Jacks Valley (see **Table 2-2**). The projects would result in approximately 54 ac of disturbance.

Table 2-2. Land Modification Proposed within Jacks Valley

Project ID	Project Title	Approximate Size of Disturbance (ac)	Project Location
E	Baffle CATM Ranges	4	CATM
N	Construct Counter IED Identification Training Course	15	BCT
X	Construct Drainage Improvements at the Assault Course and Obstacle Course	5	BCT
AE	Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements	30	Jacks Valley
	Total	**54**	

2.3.2.1 PROJECT E: BAFFLE CATM RANGES

The Proposed Action is to install barriers to baffle the existing CATM outdoor ranges. Baffles are specifically designed as berms, backstops, walls, and/or ceilings to contain splatter and ricochet of a bullet. Baffling the ranges would eliminate the need for the existing SDZs[1] and would reduce existing impacts on the Cathedral Rock cultural resources area. This would result in approximately 4 ac of disturbance. **Figure 2-1** shows the location of the existing outdoor training ranges that would be baffled.

Alternatives Considered but Eliminated from Analysis in the EA. The existing CATM outdoor ranges are in a fixed location and would be baffled to remove SDZs and to reduce current impacts on cultural resources. Because the proposed modification is to an existing facility, it could not be addressed by siting an alternative elsewhere. No other alternatives were identified that met the purpose of and need for this Proposed Action.

Alternatives to be Analyzed in the EA for Project E. The following alternatives are carried forward for analysis in the EA:

- **Project E (Preferred Alternative):** USAF would implement the described Proposed Action for Project E, to baffle the existing CATM outdoor ranges.
- **No Action Alternative for Project E:** Under the No Action Alternative, Project E would not be conducted, and the existing outdoor ranges would continue to be used without baffles. Firing at the ranges would continue to require SDZs, and the current impacts on cultural resources would not be reduced.

2.3.2.2 PROJECT N: CONSTRUCT COUNTER IED IDENTIFICATION TRAINING COURSE

The Proposed Action is to develop a 15 ac counter IED identification training course in the BCT training area. **Figure 2-2** shows the notional project area for the counter IED identification training course. The training course would provide cadets with the opportunity to learn IED identification in Jacks Valley. This training course would contain replica IEDs; no live IEDs would be used in the course. As part of the course construction, a storage facility would be installed, and an overhead cover would be installed for the course instruction area.

Alternatives Considered but Eliminated from Analysis in the EA. The proposed training course would be near existing training courses and would include an existing unpaved road. Siting alternatives outside of the BCT training area would not meet the Planning Constraints (natural, built, land use compatibility) selection standard because such alternatives would not be adjacent to the existing training courses or would not have an existing road, increasing the potential for environmental impacts due to access road construction.

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[1] An SDZ is an area associated with a training range that is designed to protect people during weapons training. It may include land, water, and airspace. When a range is in active use, the SDZ is an exclusion area that is strictly controlled and could contain projectiles, fragments, or components from firing weapons.

Alternatives to be Analyzed in the EA for Project N. The following alternatives are carried forward for analysis in the EA:

- **Project N (Preferred Alternative):** USAF would implement the described Proposed Action for Project N, to construct the counter IED identification training course in the BCT training area, adjacent to the existing training courses.
- **No Action Alternative for Project N:** Under the No Action Alternative, Project N would not be constructed, and cadets would not have an adequate training location for IED identification.

2.3.2.3 PROJECT X: CONSTRUCT DRAINAGE IMPROVEMENTS AT THE ASSAULT COURSE AND OBSTACLE COURSE

The Proposed Action is to construct approximately 5 ac of drainage improvements at the assault and obstacle courses within the BCT training area. **Figure 2-2** shows a notional location for the proposed improvements. The improvements would reduce erosion potential and would include grading and installation of drainage swales.

Alternatives Considered but Eliminated from Analysis in the EA. This project would improve drainage at existing training courses, in accordance with engineering designs, and could not be addressed by siting alternatives elsewhere. Siting drainage improvement alternatives outside of the BCT training area, not adjacent to the existing training courses, would not meet the purpose of and need for this Proposed Action.

Alternatives to be Analyzed in the EA for Project X. The following alternatives are carried forward for analysis in the EA:

- **Project X (Preferred Alternative):** USAF would implement the described Proposed Action for Project X, to improve drainage at the existing assault and obstacle training courses in the BCT training area.
- **No Action Alternative for Project X:** Under the No Action Alternative, Project X would not be constructed, and erosion would continue to occur at the assault and obstacle training courses in the BCT training area.

2.3.2.4 PROJECT AE: PROVIDE JACKS VALLEY DISTRICT-WIDE EROSION CONTROL AND STORMWATER DRAINAGE IMPROVEMENTS

The Proposed Action is to make Jacks Valley district-wide erosion control and stormwater drainage improvements to improve water flow across the district and to reduce the potential for erosion. Approximately 30 ac of repairs would include drainage ditch repairs, culvert repairs, and installation of erosion control devices. This project is addressed programmatically in the EA because project-specific locations for improvements have not yet been identified; district-wide drainage improvements are not shown in **Figures 2-1** and **2-2**.

Alternatives Considered but Eliminated from Analysis in the EA. This project would improve drainage and reduce erosion across Jacks Valley in accordance with engineering designs. Other siting or action alternatives for improvements would not meet the Sustainability Development Indicators selection standard because such alternatives would not as greatly improve the ability of Jacks Valley to support training mission requirements into the future.

Inadequate erosion control and stormwater runoff measures could cause the quality of natural habitat and training land to degrade and could also affect built infrastructure.

Alternatives to be Analyzed in the EA for Project AE. The following alternatives are carried forward for analysis in the EA:

- **Project AE (Preferred Alternative):** USAF would implement the described Proposed Action for Project AE, to make district-wide erosion control and stormwater drainage improvements.
- **No Action Alternative for Project AE:** Under the No Action Alternative, Project AE would not occur, and Jacks Valley district-wide erosion and stormwater issues would continue.

2.3.3 Roads and Trails Improvements

Seven road and trail improvement projects have been proposed within Jacks Valley (see **Table 2-3** and **Figures 2-1** and **2-2**). The projects would result in approximately 658,591 sq ft (15.1 ac) of disturbance.

Table 2-3. Roads and Trails Improvements Proposed within Jacks Valley

Project ID	Project Title	Approximate Size of Disturbance (sq ft)	Project Location
C	Construct North/South Connector Roads	69,750	Jacks Valley
J	Construct CATM Bypass Road	52,875	CATM
K	Construct FERL Parking Lot	25,200	FERL
L	Construct FERL Road Improvements	156,150	FERL
O	Return Unused Roads to Natural Condition	47,916	BCT and Jacks Valley
S	Improve the Existing BCT Parking Lot	60,300	BCT
AG	Construct a Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard	246,400	Jacks Valley
	Total	**658,591**	

2.3.3.1 PROJECT C: CONSTRUCT NORTH/SOUTH CONNECTOR ROADS

The Proposed Action is to construct north/south connector roads in multiple locations in Jacks Valley. **Figures 2-1** and **2-2** provide notional project areas identified for the north/south connector roads; one road would be constructed in each project area. The project areas were selected to deter off-road vehicle access currently occurring in these areas and to prevent further erosion created by off-road travel. These proposed roads would effectively replace existing unauthorized trails with improved granite roads suitable for vehicle travel. The north/south connector roads would each consist of a 10-foot-wide unpaved crushed granite road and would total 6,975 linear feet, resulting in a total of 69,750 sq ft of disturbance.

Alternatives Considered but Eliminated from Analysis in the EA. The proposed connector roads are sited in locations to provide north/south vehicle access in accordance with where off-road trails are currently common and to avoid known natural and cultural resources. Siting north/south connector roads in other locations would not meet the Planning Constraints (natural, built) or Sustainability Development Indicators selection standards. Alternative siting locations would not provide north/south access where it frequently occurs, and unauthorized off-road access would likely continue, which would also increase the potential for erosion and environmental impacts.

Alternatives to be Analyzed in the EA for Project C. The following alternatives are carried forward for analysis in the EA:

- **Project C (Preferred Alternative):** USAF would implement the described Proposed Action for Project C, to construct north/south connector roads in Jacks Valley.
- **No Action Alternative for Project C:** Under the No Action Alternative, Project C would not be constructed, and the unauthorized, unimproved off-road trails would continue to be used.

2.3.3.2 PROJECT J: CONSTRUCT CATM BYPASS ROAD

The Proposed Action is to construct a CATM bypass road in a previously undeveloped area, which would establish an alternative route to decrease through-traffic in the CATM area and improve vehicle circulation in Jacks Valley. The bypass road would be unpaved and would be approximately 24 feet (ft) wide with about 10 to 12 inches of depth for base course and gravel. This project would be approximately 2,200 linear feet and would result in 52,875 sq ft of disturbance. **Figure 2-1** shows the notional project area for the CATM bypass road.

Alternatives Considered but Eliminated from Analysis in the EA. This road is proposed to provide a shorter route between FERL Road and Jacks Valley Road, and to bypass the CATM area, which is a safety requirement for traffic to bypass the live-fire area. The road is proposed to provide a specific utility; therefore, siting alternatives outside of the proposed project area would not meet the Planning Constraints (built) selection standard because such alternatives would not provide the functionality needed.

Alternatives to be Analyzed in the EA for Project J. The following alternatives are carried forward for analysis in the EA:

- **Project J (Preferred Alternative):** USAF would implement the described Proposed Action for Project J, to construct the CATM bypass road between FERL Road and Jacks Valley Road.
- **No Action Alternative for Project J:** Under the No Action Alternative, Project J would not be constructed, and through-traffic would continue to move through the CATM area.

2.3.3.3 PROJECT K: CONSTRUCT FERL PARKING LOT

The Proposed Action is to construct a parking lot within the existing unpaved parking area adjacent to FERL Road in the FERL training area, which would result in approximately 25,200 sq ft of disturbance. Construction would include defining the boundaries of the parking lot, levelling and grading the area, and potentially placing gravel on the top surface of the parking area. The FERL parking lot would include up to 60 parking spaces. **Figure 2-1** shows the notional parking lot location within the FERL training area.

Alternatives Considered but Eliminated from Analysis in the EA. While there are approximately 20 ac of developable land north of FERL Road where a parking lot could be sited within the FERL training area, the Proposed Action would use an existing unpaved parking area adjacent to FERL Road. This would minimize ground disturbance and environmental impacts, while still providing proximity to the FERL training and storage facilities. Siting the proposed parking lot in an alternative location within the FERL training area would not meet the Planning Constraints (natural) or Sustainability Development Indicators selection standards because such locations would require vegetation and habitat clearing.

Alternatives to be Analyzed in the EA for Project K. The following alternatives are carried forward for analysis in the EA:

- **Project K (Preferred Alternative):** USAF would implement the described Proposed Action for Project K, to construct the FERL parking lot within the existing unpaved parking area adjacent to FERL Road in the FERL training area.
- **No Action Alternative for Project K:** Under the No Action Alternative, Project K would not be constructed, and the existing unpaved FERL parking lot would continue to be used. Erosion of the lot would continue and would require regular maintenance.

2.3.3.4 PROJECT L: CONSTRUCT FERL ROAD IMPROVEMENTS

The Proposed Action is to construct road improvements on approximately 156,150 sq ft of existing roads, approximately 2,800 linear feet, in the FERL training area. The roads proposed for maintenance are damaged or deteriorated and require maintenance for safety and continued use by cadets and instructors. Paving improvements would occur only on the portions of this road that are already paved; additional pavement is not proposed. **Figure 2-1** identifies the roads leading to and from the FERL training area that would be improved.

Alternatives Considered but Eliminated from Analysis in the EA. The existing roads, which are in a fixed location, would be improved in accordance with mission requirements and could not be addressed by siting alternatives elsewhere. Improving roads other than the FERL roads would not meet the purpose of and need for this Proposed Action.

Alternatives to be Analyzed in the EA for Project L. The following alternatives are carried forward for analysis in the EA:

- **Project L (Preferred Alternative):** USAF would implement the described Proposed Action for Project L, to construct road improvements on existing roads in the FERL training area.
- **No Action Alternative for Project L:** Under the No Action Alternative, Project L would not be constructed, and the existing roads would continue to deteriorate and pose a safety hazard.

2.3.3.5 PROJECT O: RETURN UNUSED ROADS TO NATURAL CONDITION

The Proposed Action is to return unused roads in the BCT training area and south of the BCT training area near the MSA to natural conditions. Approximately 47,916 sq ft of existing dirt roads, each approximately 1,200 linear feet, would be broken up and mixed with topsoil for native seeding and plantings. **Figure 2-2** shows the roads that would be returned to natural conditions.

A portion of the road in the BCT training area is within a floodplain; therefore, this project has the potential for disturbance within a floodplain. During the breakup of these dirt roads, USAF would implement erosion and stormwater control BMPs, such stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; and using erosion control blankets. After road demolition, this area would be allowed to return to natural habitat through native seeding and plantings.

Alternatives Considered but Eliminated from Analysis in the EA. The existing roads are dirt roads that are not regularly used and would be returned to a natural condition to support long-term sustainability of Jacks Valley habitat in accordance with the Sustainability Development Indicators selection standard. These are existing unused roads in fixed locations, and no other siting alternatives were identified.

Alternatives to be Analyzed in the EA for Project O. The following alternatives are carried forward for analysis in the EA:

- **Project O (Preferred Alternative):** USAF would implement the described Proposed Action for Project O, to return unused roads in the BCT training area and south of the BCT training area near the MSA to natural conditions.
- **No Action Alternative for Project O:** Under the No Action Alternative, Project O would not be constructed, and the existing roads would continue to be unused and would not provide suitable vegetation or wildlife habitat.

2.3.3.6 PROJECT S: IMPROVE THE EXISTING BCT PARKING LOT

The Proposed Action is to improve the existing parking lot in the BCT training area, which would include grading and levelling, resulting in approximately 60,300 sq ft of disturbance. The BCT parking lot improvements would include better lighting and an additional gravel sidewalk. **Figure 2-2** shows the location of the existing BCT parking lot.

Alternatives Considered but Eliminated from Analysis in the EA. The existing unpaved parking lot is in a fixed location and would be improved to create a graded and level surface to provide better drainage and safety. Improving the existing lot, rather than constructing a new lot, would minimize ground disturbance and environmental impacts while still providing proximity to the BCT training facilities and courses. Siting a parking lot in an alternative location within the BCT training area would not meet the Planning Constraints (natural) and Sustainability Development Indicators selection standards because such locations would require vegetation and habitat clearing.

Alternatives to be Analyzed in the EA for Project S. The following alternatives are carried forward for analysis in the EA:

- **Project S (Preferred Alternative):** USAF would implement the described Proposed Action for Project S, to improve the existing BCT parking lot.

- **No Action Alternative for Project S:** Under the No Action Alternative, Project S would not be constructed, and the existing unimproved lot, which lacks lighting and a sidewalk, would continue to be used.

2.3.3.7 PROJECT AG: CONSTRUCT A RUNNING/WALKING/BIKING TRAIL ALONG ACADEMY DRIVE AND NORTH GATE BOULEVARD

The Proposed Action is to construct a 6-foot-wide, 17,600-linear-foot, unpaved trail to be used by the cadets for running, walking, and biking along Academy Drive and North Gate Boulevard. Approximately 246,400 sq ft (5.65 ac) of disturbance would be required, which would include the 6-foot-wide trail as well as a 4-foot buffer on either side of the trail to construct shoulders and any necessary culverts.

As Academy Drive approaches the intersection with the POW camp entrance road, it runs adjacent to floodplains associated with Deadman's Creek. USAF would avoid any activity or disturbance in these floodplains, and the proposed trail would be narrowed or moved so that it would fall within the existing road shoulder or outside of the floodplain or both. To avoid activity within, or disturbance to, the floodplain, USAF would also implement erosion and stormwater control BMPs, such stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; and using erosion control blankets. During design, USAF would ensure that post-project hydrology mirrors pre-project hydrology to the maximum extent technically feasible. The JVDP did not specify a side of Academy Drive and North Gate Boulevard for construction; therefore, analysis will be conducted for both sides.

Alternatives Considered but Eliminated from Analysis in the EA. It is currently unknown whether the trail would be constructed within the north or south shoulder of the existing roadway, so both options will be evaluated in the EA. Analyzing the trail on both sides of the road would allow for flexibility in the plan design and would allow for the trail to cross from the north to the south side of the roadway and vice versa. This trail is proposed to provide safer transport for foot traffic along these roads, which are already used for running, walking, and biking. These roads are in a fixed location, and the purpose and need could not be addressed by siting this trail elsewhere. Siting the trail in an alternative location would not meet the Planning Constraints (built) selection standard and would not meet the purpose of and need for this Proposed Action.

Alternatives to be Analyzed in the EA for Project AG. The following alternatives are carried forward for analysis in the EA:

- **Project AG (Preferred Alternative):** USAF would implement the described Proposed Action for Project AG, to construct a running, walking, and biking trail along Academy Drive and North Gate Boulevard.

- **No Action Alternative for Project AG:** Under the No Action Alternative, Project AG would not be constructed, and recreational users would continue to use the road shoulders, off-road trails, or the actual road for running, walking, and biking. Under the No Action Alternative, recreational users would be exposed to safety hazards from vehicles on the road, or would cause erosion from off-road and road shoulder usage.

2.3.4 Utilities and Communications Installation

One utilities and communication project has been proposed in Jacks Valley (see **Table 2-4** and **Figures 2-1** and **2-2**). The project would result in approximately 271,600 sq ft (6.2 ac) of disturbance.

Table 2-4. Utilities and Communications Proposed within Jacks Valley

Project ID	Project Title	Approximate Size of Disturbance (sq ft)	Project Location
AH	Loop the Jacks Valley District Water Supply Line	271,600	Jacks Valley
	Total	**271,600**	

2.3.4.1 PROJECT AH: LOOP THE JACKS VALLEY DISTRICT WATER SUPPLY LINE

The Proposed Action is to loop existing water supply lines throughout Jacks Valley to provide better water supply within the district. Currently, the water distribution system has lines that terminate at the POW camp area, the north area of CATM, and various locations near the BCT area. This project would loop (i.e., reconnect) the water lines to the existing water lines to improve the water pressure and water quality in Jacks Valley. A total of approximately 13,580 linear feet of water supply lines would be installed. The project area would include a 20-foot-wide corridor for the construction footprint and would result in approximately 271,600 sq ft (6.2 ac) of disturbance. **Figures 2-1** and **2-2** show the notional locations for the supply lines.

Alternatives Considered but Eliminated from Analysis in the EA. The supply lines would loop off the existing lines, which are in a fixed location and could not be addressed by siting alternatives elsewhere. Additionally, supply line loops would continue to be in roadway shoulders, minimizing ground disturbance and environmental impacts. Siting supply line loops in alternative locations would not meet the Planning Constraints (built, natural) selection standard.

Alternatives to be Analyzed in the EA for Project AH. The following alternatives are carried forward for analysis in the EA:

- **Project AH (Preferred Alternative):** USAF would implement the described Proposed Action for Project AH, to loop the existing water supply lines in Jacks Valley.
- **No Action Alternative for Project AH:** Under the No Action Alternative, Project AH would not be implemented, the water supply system would remain unchanged, and water availability would continue to be limited in Jacks Valley.

2.3.5 Proposed Action Summary

The JVDP included 34 projects; of these 34 projects, 5 priority projects have been addressed in separate EIAP documentation, 1 project is no longer considered viable, and 28 projects are presented in this EA as part of the district development within Jacks Valley at USAFA. This EA assumes that all projects could occur within the next 5 years. Due to the nature of the actions, it can be determined without additional analysis that 9 of the 28 projects that are part of Jacks Valley district development, presented in **Section 1.6, Table 1-1**, would not, either individually or cumulatively, have the potential for significant effects on human health and the environment. The remaining 19 projects addressed in this EA include facility construction and demolition, land modification, roads and trails improvements, and utilities and communications installation. A total of approximately 3,367,251 sq ft (77.3 ac) of disturbance in Jacks Valley would occur from the development projects included in the Proposed Actions (see **Table 2-5**).

Table 2-5. Summary of Disturbance

Activity Type	Approximate Size of Total Disturbance (sq ft [ac])
Facility Construction and Demolition	85,060 (2.0)
Land Modification	2,352,000 (54.0)
Roads and Trails Improvements	658,591 (15.1)
Utilities and Communications Installation	271,600 (6.2)
Total	**3,367,251 (77.3)**

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3. Affected Environment and Environmental Consequences

3.1 Introduction

This section describes the environmental resources and conditions most likely to be affected by the Proposed Actions and alternatives and provides information to serve as a baseline from which to identify and evaluate potential environmental impacts. Baseline conditions represent current conditions. This section also describes the potential environmental impacts of the Proposed Actions and alternatives on the baseline conditions.

3.1.1 Scope of Analysis

As explained in **Sections 1** and **2**, the Proposed Actions addressed in this EA include 19 district development projects selected from the JVDP (see **Section 1.8, Table 1-3**). This EA treats each project as a discrete Proposed Action; because of similarities in project types, the EA summarizes the types of impacts anticipated where impacts across Proposed Actions are anticipated to be similar. The EA describes in detail impacts for Proposed Actions where the context or intensity of impacts would differ. The Proposed Actions include the following types of activities:

- Facility construction and demolition
- Land modification
- Roads and trails improvements
- Utilities and communications installation

3.1.2 Resource Analysis

Sections 3.2 through 3.11 address impacts on the environmental resources carried forward for analysis in this EA. Resource definitions, overviews of the applicable environmental regulations for the Proposed Actions and the project areas, and other supporting information are provided in **Appendix C**. Based on the scope of the Proposed Actions, resource areas with minimal or no impacts were identified through a preliminary screening process. **Appendix C** describes those resource areas not being carried forward for detailed analysis, along with the rationale for their elimination. **Appendix D** provides an evaluation of other environmental considerations.

3.1.3 Reasonably Foreseeable Actions

As noted in **Section 1.1**, this EA is developed in accordance with the 2020 CEQ NEPA regulations (40 CFR Parts 1500–1508) and therefore analyzes environmental impacts from the Proposed Actions and alternatives combined with potential impacts from reasonably foreseeable actions**.** One reasonably foreseeable action that could have a causal relationship with the Proposed Actions and could contribute to additional impacts is the USAFA ABEL program, described below. No other reasonably foreseeable projects have been identified for analysis; no other USAFA projects are planned in Jacks Valley, and due to size and geographic separation of the district, no other known projects at USAFA or in the region would have potential interrelationship with the Proposed Actions.

USAFA Adventure-Based Experiential Learning. This USAFA cadet training program is to be conducted on USDA Forest Service land adjacent to the western boundary of Jacks Valley. USAFA would conduct up to nine 36-hour training events during 10-day periods from June through August. Depending on the location within the training area, the project would consist of cadet and faculty navigation by foot on trails, and on and off trails to waypoints. The ABEL program would also include use of USDA Forest Service roads for training support and pre-disturbed upland roadside areas for two cadet support camps.

See the Environmental Consequences section for each resource area analyzed in this EA for a discussion of potential impacts of the Proposed Actions together with the ABEL program.

3.2 Land Use

3.2.1 Existing Conditions

USAFA is federally owned and operated by USAF. Land use planning, development, and use decisions at USAFA are guided by the following plans:

- The 2020 JVDP identified requirements for the improvement of the physical infrastructure and functionality of Jacks Valley, including current and future missions, facilities and infrastructure requirements, development constraints and opportunities, and land use relationships (USAF 2020).
- The 2018 USAFA Installation Development Plan described the installation's past, present, and future states to guide future programming decisions (USAFA 2018a).
- The Integrated Natural Resources Management Plan provides guidance for the protection and management of natural resources across the installation (USAFA 2018b).
- The 2018 Colorado Springs Regional Joint Land Use Study reviewed compatibility issues related to impacts of military operations and community growth to account for the five major military installations in the region: USAFA, Fort Carson, Peterson Air Force Base, Cheyenne Mountains Air Force Station, and Schriever Air Force Base. Key land use compatibility issues identified in the Joint Land Use Study that are applicable to Jacks Valley include compliance with regulations, and potential impacts on stormwater management (PPACG 2018).

USAFA uses natural, physical, and visual landscape features to identify eight separate districts. The eight districts include Cadet Area; Airfield; Service and Supply; Housing; Internal Community; External Community; Jacks Valley; and the Husted, Edgerton, Northfield Corridor. Land on USAFA is used and developed within these districts with consideration of nearby environmental resource constraints such as topography, wetlands and floodplains, endangered species, security, SDZs, historical or cultural resources, transportation, and utility infrastructure (USAF 2020). Depending on the potential threat to human health and safety or sensitive resources, development may be prohibited (for major constraints), may be restricted (for minor constraints), or may proceed without constraints (USAF 2020; USAFA 2018a).

As described in **Section 1.3**, Jacks Valley comprises approximately 3,300 ac along the northern boundary of the installation, with Monument Creek to the east and Academy Drive to the south. Directly east of Jacks Valley are small portions of the External Community and the Husted, Edgerton, Northfield Corridor districts (USAFA 2018a). Lands surrounding Jacks Valley outside the installation boundaries are predominantly park, agricultural, and USDA Forest Service forest to the west and residential to the north with some park, agricultural, and forest (PPACG 2018).

Jacks Valley lands are predominately designated as natural open space, with some designated open space and restricted open space, munitions support area, field training, and protection boundary. Land uses in these areas include field training, community commercial, industrial, and academic areas. The JVDP consolidates similar land uses to optimize training and operational efficiency across the district. Additionally, in accordance with the USAFA Installation Development Plan, planning, development, and training actions at Jacks Valley must preserve important views and vistas, preserve the Cadet Area chapel as the focal point of the installation, develop communities of facilities, preserve transitional areas, support expandability and flexibility, support sustainability, and incorporate force protection requirements (USAFA 2018a). Future land use planning goals at Jacks Valley include updating land use designations to align with the consolidated functional land uses more appropriately therein. The changes in land use designation would not alter the intent of the original land uses.

Table 3-1 identifies the mission and training areas and associated land use constraints for each of the Proposed Actions at Jacks Valley, and **Figure 3-1** shows the land use constraints in relation to the Proposed Actions.

3.2.2 Environmental Consequences

Land use compatibility is defined as the ability of two or more land uses to coexist without conflict. Potential effects associated with land use—including usage, construction, demolition, and operations—and land use sensitivity in areas affected by the Proposed Actions were analyzed. Additionally, compatibility of the Proposed Actions with existing land use conditions was considered. A Proposed Action could have a significant effect with respect to land use if any of the following were to occur:

- Conflict with existing land use plans or policies
- Conflict with planning criteria established to ensure the safety and protection of human life and property
- Precluding continued use or occupation of an area
- Incompatibility with adjacent land uses

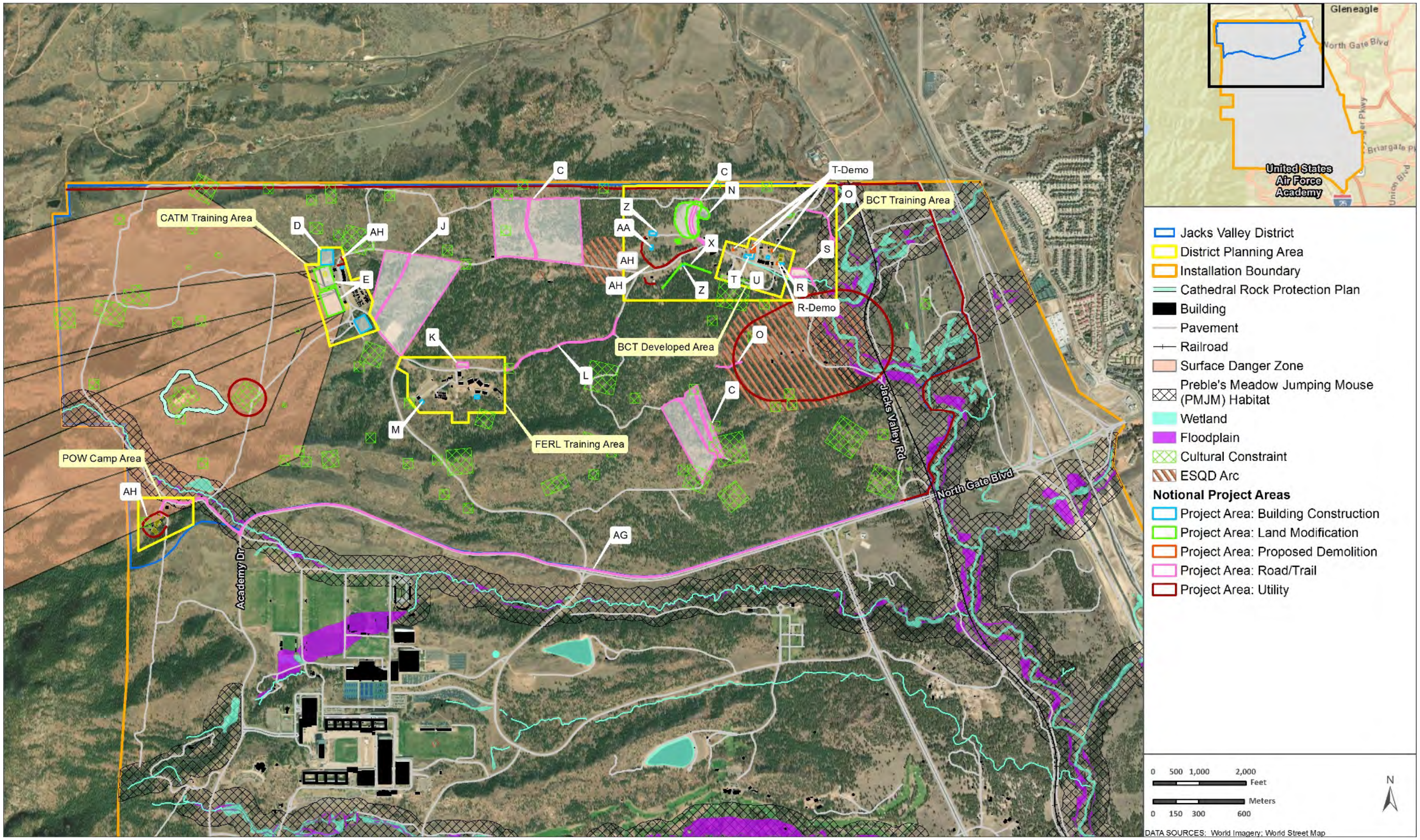
Table 3-1. Land Use Designations and Constraints Associated with Proposed Actions

Project ID	Project Name [a]	Land Use Designation [b]	Land Use Constraints
Facility Construction and Demolition			
D, D1	Construct Regional Indoor Firing Range	Field Training	Explosive safety zones
M	Construct FERL Storage Facility	Field Training	Historic and cultural resources
R	Construct ATV Storage Facility	Field Training	Historic and cultural resources
T	Construct Consolidated BCT Facility	Field Training	Historic and cultural resources
U	Construct Dining Facility Storage	Field Training	Historic and cultural resources
Z	Construct Four Training Course Restrooms	Field Training	None identified
AA	Construct CBRNE Facility	Field Training	None identified
Land Modification			
E	Baffle CATM Ranges	Field Training	SDZs and explosive safety zones
N	Construct Counter IED Identification Training Course	Field Training	None identified
X	Construct Drainage Improvements at the Assault Course and Obstacle Course	Field Training	None identified
AE	Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements	Field Training	Threatened and endangered species; SDZs and explosive safety zones; historic and cultural resources; wetlands and floodplain
Roads and Trails Improvements			
C	Construct North/South Connector Roads	Natural Open Space	Explosive safety zones; historic and cultural resources
J	Construct CATM Bypass Road	Natural Open Space	Explosive safety zones
K	Construct FERL Parking Lot	Field Training	None identified
L	Construct FERL Road Improvements	Natural Open Space	Historic and cultural resources
O	Return Unused Roads to Natural Condition	Field Training, Natural Open Space	Threatened and endangered species
S	Improve the Existing BCT Parking Lot	Field Training	None identified
AG	Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard	Natural Open Space	Threatened and endangered species; wetlands and floodplain
Utilities and Communications Installation			
AH	Loop the Jacks Valley District Water Supply Line	Natural Open Space	SDZs and explosive safety zones; historic and cultural resources

Source: USAF 2020
Key (in order of appearance): CATM = Combat Arms Training and Maintenance; SDZ = surface danger zone; FERL = Field Engineering Readiness Laboratory; BCT = Basic Cadet Training; CBRNE = chemical, biological, radiological, and nuclear explosives; IED = Improvised Explosive Device

[a] JVDP projects identified for implementation over the next 5 years.

[b] Future land use planning goals at Jacks Valley include updating land use designations to align with the consolidated functional land uses more appropriately therein (USAF 2020; USAFA 2018a). The planned changes in land use designation would not alter the intent of the original land uses.

1 

2 **Figure 3-1. Land Use Constraints**

3.2.2.1 PROPOSED ACTIONS

Short-term, minor, adverse impacts, and long-term, minor to moderate, beneficial impacts on land use would occur in Jacks Valley from implementation of the Proposed Actions. Impacts for the Proposed Actions include the following:

- Overall, the Proposed Actions would be sited and developed in consideration of identified environmental and use constraints, where applicable. Operation of the Proposed Actions would conform to the existing on-installation land use designations, operational support functions, and development plans for the areas where they would be operated, per the USAFA Installation Development Plan and the JVDP. Additionally, the Proposed Actions would be consistent with land uses surrounding the installation and would be in conformance with the Joint Land Use Study.

- Land use designations for areas encompassing the Proposed Actions would likely be changed to optimize land use efficiency and to align with the functional land uses more appropriately. These changes in land use designation would not alter the intent of the original land use designation. This would result in long-term, minor, beneficial impacts on land use and operational efficiency for the installation.

- Short-term, minor, adverse impacts on land use in the BCT developed area would be expected because of increased noise during the demolition of five buildings associated with Projects R and T and construction associated with these Proposed Actions. These impacts would be temporary, lasting only during demolition and construction activities, and would occur only during work hours.

- Long-term, moderate, beneficial impacts on land use would be expected from the implementation of Project E (Baffle CATM Ranges). This baffling would eliminate the need for the existing SDZs and would reduce existing impacts on the Cathedral Rock cultural resources area.

- Construction and operation of new roads, constructing an indoor firing range, and baffling the outdoor ranges in the CATM training area (Projects J, D, and E) would improve training efficiency and consolidate uses to that area per the JVDP. Because land in the CATM training area is already partially disturbed, construction and operation of these training facilities would not require conversion of undeveloped natural spaces. Long-term impacts from these changes would be minor and beneficial.

- Short-term, minor, adverse effects and long-term, minor, beneficial effects on land use would be expected with the implementation of Project O (Return Unused Roads to Natural Condition), which is partially within a floodplain. The rerouting of vehicle traffic to new roads would result in minor disruptions of existing travel in Jacks Valley. However, the proposed connector roads and roadway improvements associated with Project C (Construct North/South Connector Roads) would provide new and more efficient road and trail infrastructure; these changes would support long-term beneficial impacts from optimized land use.

3.2.2.2 PROJECT D1 ALTERNATIVE

The short-term, negligible to minor, adverse impacts and long-term, minor, beneficial impacts on land use from the construction and operation of the Project D1 Alternative would be the same as described for the Proposed Actions. The only difference would be that the indoor firing range (Project D1) would be constructed and operated in the southern portion of the CATM training area.

3.2.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on land use.

3.2.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and land use conditions in Jacks Valley would remain unchanged.

3.3 Biological Resources

3.3.1 Existing Conditions

3.3.1.1 VEGETATION

The vegetation types in Jacks Valley are generally divided into montane and foothill zones. The montane zone occurs between 8,000 and 9,000 ft elevation. The foothill zone occurs between 6,000 and 8,000 ft elevation (USAFA 2018b).

The montane zone along the western edge of Jacks Valley consists of mixed conifer forests and steep slopes of the Rampart Range. Common species in this zone include Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), limber pine (*Pinus flexilis*), blue spruce (*Picea pungens*), Englemann spruce (*Picea engelmannii*), and common juniper (*Juniperus communis*). Dominant shrubs include kinnikinnik (*Arctostaphylos uva-ursi*), waxflower (*Jamesia americana*), and mountain mahogany (*Cercocarpus montanus*; USAFA 2018b).

The foothills zone occurs in the remainder of Jacks Valley and is subdivided into four community types:

1. The Douglas-fir / white fir woodlands are dominated by Douglas-fir, with some white fir occurring on moist, north-facing slopes. Important associates include common juniper, waxflower, and mountain mahogany.

2. Ponderosa pine woodlands are the most prevalent woodland community in the foothills. This community occurs on sites drier than those supporting Douglas-fir and white fir, but moister than those dominated by grasslands. Common associates are gooseberries and currants (*Ribes aureum* and *R. cereum*), yellow mountain parsley (*Pseudocymopterus montanus*), mountain muhly (*Muhlenbergia montana*), ninebark (*Physocarpus monogynus*), and Gambel oak (*Quercus gambelii*).

3. The oak shrubland community dominates the mesas and dry, south-facing slopes in the foothills. The dominant species is Gambel oak. Piñon pine (*Pinus edulis*) and one-seeded juniper (*Juniperus monosperma*) are small trees found in this community in the southern parts of the installation. Also, occasional ponderosa pines occur in this community. Important shrubs include mountain mahogany, ocean spray (*Holodiscus dumosus*), boulder raspberry (*Rubus deliciosus*), and snowberry (*Symphoricarpus albus*).

4. Grasslands occur on much of the eastern portion of the installation. The grasslands community is dominated by short-grass prairie species that include blue grama (*Bouteloua gracilis*), little bluestem (*Schizchyrium scoparium*), fringed sage (*Artemisia frigida*), and Spanish bayonet (*Yucca glauca*). It extends into forested communities of the upper foothills zone (USAFA 2018b).

Vegetation mapping was conducted throughout the installation in 2020. In Jacks Valley, there are 18 vegetation alliances, which are a defined level of community type based off the dominant species present (see **Table 3-2**).

Table 3-2. Vegetation Alliances in Jacks Valley

Alliance Type	Acreage
Ponderosa Pine Southern Rocky Mountain Forest and Woodland Alliance	999.45
Quercus gambelii - Symphoriocarpus oreophilus Shrubland Alliance	865.25
Agropyron cristatum - Bromus inermis - Poa pratensis Ruderal Grassland Alliance	330.62
Pinus ponderosa Southern Rocky Mountain Forest and Woodland Alliance	243.18
Agropyron cristatum - Bromus inermis - Poa pratensis Ruderal Grassland Alliance	185.82
Pinus ponderosa / Grass Understory Southern Rocky Mountain Open Woodland Alliance	160.78
Pseudotsuga menziesii Southern Rocky Mountain Forest and Woodland Alliance	150.72
Amelanchier utahensis - Cercocarpus montanus - Cercocarpus intricatus Shrubland Alliance	137.94
N/A – unidentified and/or unclassified	61.34
Salix exigua - Salix irrorata Shrubland Alliance	5024
Bouteloua gracilis - Bouteloua hirsuta - Bouteloua curtipendula Shortgrass Prairie Alliance	37.85
Rhus glabra - Rhus trilobata Central Rocky Mountain Montane-Foothill Shrubland Alliance	32.83
Yucca glauca Prairie Scrub Alliance	19.67
Typha domingensis - Typha latifolia - Phragmites australis ssp. americanus Western Marsh Alliance	12.96
Festuca arizonica - Muhlenbergia montana - Poa fendleriana Southern Rocky Mountain Montane Grassland Alliance	5.96
Juncus arcticus ssp. littoralis - Juncus mexicanus Wet Meadow Alliance	5.66
Populus angustifolia Riparian Forest Alliance	5.51
Mixed Herbaceous Ruderal Alliance	1.89
Caragana arborescens Ruderal Shrubland Alliance	1.04
Total	**3,308.73**

3.3.1.2 WILDLIFE

Various MBTA-protected bird species and other non-MBTA-protected bird species are present in Jacks Valley, including the red-tailed hawk (*Buteo jamaicensis*), wild turkey (*Meleagris gallopavo*), prairie falcon (*Falco mexicanus*), scrub jay (*Aphelocoma coerulescens*), and spotted towhee (*Pipilo erythrophthalmus*). Grassland birds include rough-legged hawk (*Buteo lagopus*), western kingbird (*Tyrannus tyrannus*), western bluebird (*Sialia mexicana*), and vesper sparrow (*Pooecetes gramineus*). Representative birds occurring in or near riparian areas include great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis hypoleucos*), orange-crowned warbler (*Vermivora celata*), common yellowthroat (*Geothylpis trichas*), Wilson's warbler (*Wilsonia pusilla*), yellow warbler (*Dendroica petechia*), American goldfinch (*Spinus tristis*), and broad-tailed hummingbird (*Selasphorus platycercus*; USAFA 2018b).

Common mammals in Jacks Valley include coyote (*Canis latrans*), red fox (*Vulpes vulpes*), spotted ground squirrel (*Spermophilus spilosoma*), northern pocket gopher (*Thomomys talpoides*), western harvest mouse (*Reithrodontomys megalotis*), white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), beaver (*Castor canadensis*), several bat species, muskrat (*Ondatra zibethica*), gray fox (*Urocyron cinereoargenteus*), black bear (*Ursus americanus*), cottontail rabbit (*Sylvilagus audubonii*), raccoon (*Procyon lotor*), meadow vole (*Microtus pennsylvanicus*), and montane shrew (*Sorex monticolus*; USAFA 2018b).

Reptiles and amphibians in Jacks Valley include the short-horned lizard (*Phrynosoma douglassi*), bullsnake (*Pituophis melanoleucus*), western rattlesnake (*Crotalus viridis*), chorus frog (*Pseudacris triseriata*), and northern leopard frog (*Lithobates pipiens*), as well as other amphibians in the riparian areas (USAFA 2018b).

3.3.1.3 FEDERALLY LISTED SPECIES

Based on the 2018 Integrated Natural Resources Management Plan (USAFA 2018b) and the USFWS Information for Planning and Consultation report developed for Jacks Valley (USFWS 2021), there are 10 federally listed species that have the potential to occur in Proposed Action areas. Of the 10 species potentially located within the Proposed Action areas, USAF has determined these species would not be affected by the Proposed Actions. **Table 3-3** lists the species, their federal listing status, their habitat description, and the justification for this "no effect" determination. There is no critical habitat designated or proposed on the installation for these species; therefore, no effects are expected to occur on critical habitat for these species from the implementation of the Proposed Actions. These species are not analyzed further in this EA, except for the federally threatened Preble's meadow jumping mouse (PMJM; *Zapus hudsonius preblei*). While no adverse effects are anticipated on the PMJM, additional information is provided for this species because the Proposed Actions would potentially have beneficial impacts on the PMJM and its habitat.

1 **Table 3-3. Federally Listed Species with the Potential to Occur in Jacks Valley**

Species	Listing Status[a]	Habitat Description	Effect	Justification for Effect Determination
Fish				
Greenback cutthroat trout (*Oncorhynchus clarkia stomias*)	T	Historically inhabited the South Platte river basin. Currently, the only genetically pure population exists in Bear Creek, west of Colorado Springs (CPW 2012). Bear Creek occurs in the Arkansas River Basin.	No effect	The only genetically pure population exists in Bear Creek, west of Colorado Springs (CPW 2012). Bear Creek does not occur in the Proposed Action areas, and no downstream effects are expected because no water withdrawal is anticipated from the Proposed Actions.
Pallid sturgeon (*Scaphirhynchus albus*)	E	Large, free-flowing, warm-water, turbid habitat with a diverse assemblage of physical habitats in a constant state of change (USFWS 1993).	No effect	No suitable habitat is present in Jacks Valley.
Birds				
Eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*)	T	Located in the Arkansas River Valley of Colorado. This species is a wetland-dependent bird requiring dense emergent cover (i.e., vegetation) and extremely shallow water depths (typically ≤3 centimeters) over a portion of the wetland-upland interface to support its resource needs (USFWS 2020).	No effect	No suitable habitat is present in Jacks Valley. Furthermore, the eastern black rail has not been observed in Jacks Valley or in El Paso County, and no wetland habitat is present in the Proposed Action areas.
Least tern (interior) (*Sternula antillarum*)	E	Sparsely vegetated to barren sandbars of rivers, lakes, and reservoir shorelines (USFWS 1994).	No effect	No suitable habitat is present in Jacks Valley.
Mexican spotted owl (*Strix occidentalis lucida*)	T	Old growth forests of southern Utah, Colorado, Arizona, New Mexico, west Texas, and into the mountains of northern and central Mexico. Forests are characterized by mature trees (18-inch diameter or greater), mainly Douglas-fir (Gutiérrez et al. 1995).	No effect	No suitable habitat is present in Jacks Valley.
Piping plover (*Charadrius melodus*)	T	Sandy lakeshore/reservoir beaches, river sandbars, or alkali gravelly wetlands. This species nests in shallow and pebbled scrapes (USFWS 2001).	No effect	No suitable habitat is present in Jacks Valley.
Whooping crane (*Grus americana*)	E	Coastal/inland marshes and estuaries, lakes, ponds, wet meadows, rivers, and agricultural fields. Of three wild populations, the Aransas-Wood Buffalo population is the only self-sustaining population. The last remaining wild bird in the reintroduced Rocky Mountain population died in spring 2002 (CWS and USFWS 2007).	No effect	No suitable habitat is present in Jacks Valley.

Species	Listing Status[a]	Habitat Description	Effect	Justification for Effect Determination
Mammals				
Preble's meadow jumping mouse (PMJM) (*Zapus hudsonius preblei*)	T	High plains riparian habitat often reaching to foothills riparian habitats. This species is often found in dense, herbaceous riparian vegetation, which may have an over-story canopy layer. PMJM regularly use upland grasslands adjacent to riparian habitat, and they may be dependent on some amount of open water (USFWS 2018a).	No effect	Project AG and Project O would both be within or adjacent to PMJM habitat. Although this species has been documented in Jacks Valley, the Proposed Actions would not have adverse effects on PMJM. As documented in correspondence between USAFA and USFWS on July 29, 2021 (see **Appendix E**), portions of Project AG would be located inside the Preble's Conservation Zone. However, USFWS agrees that Project AG would be conducted in mown areas within 5 to 20 feet of roadways and, therefore, would not have direct adverse effects on the PMJM. Locations within 20 feet of the roadways are regularly mown and maintained, and do not need to be accounted for under the Conservation Plan (USAFA 1999). Natural habitat restoration would be expected from activities associated with Project O. The 2000 Conservation Agreement and associated Biological Opinion (USAFA 2018b; USFWS 2000) cover all potential effects associated with habitat enhancement activities conducted on USAFA.
Plants				
Ute ladies'-tresses (*Spiranthes diluvialis*)	T	Endemic to moist soils in mesic to wet meadows near springs, lakes, or perennial streams. Most of the occurrences are along riparian edges, gravel bars, old oxbows, and moist to wet meadows along perennial streams (USFWS 1995). There is an occurrence along the western border of El Paso County over 10 miles southwest of the installation.	No effect	No suitable habitat is present in the Proposed Action areas.
Western prairie fringed orchid (*Platanthera praeclara*)	T	Moist to wet calcareous tall-grass prairies and sedge meadows. This species prefers relatively undisturbed grasslands but also can be found in moderately disturbed sites. Upstream depletions to the Platte River system in Colorado and Wyoming may affect the species in Nebraska (USFWS 2018b, 1996).	No effect	No upstream depletions to the Platte River system are expected in a way that could affect the species in Nebraska.

[a] E = Endangered; T = Threatened

PMJM is found from southeastern Wyoming to southcentral Colorado. PMJM occurs in dense, herbaceous riparian vegetation. Known PMJM locations sometimes have an overstory canopy layer, but usually have a well-developed shrub layer and a thick herbaceous layer. Most often the shrub cover consists of willow species, but the species composition seems to be secondary to the overall presence of a mature shrub component. Exotic, invasive plant species do not appear to conflict with PMJM habitat needs. A dense, herbaceous ground cover needs to be present to be considered PMJM suitable habitat (USAFA 1999). PMJM regularly use upland grasslands adjacent to riparian habitat and may be dependent on some amount of open water. The species hibernates near riparian zones from mid-October to early May. In Colorado, the PMJM is currently documented in seven counties, with one of the largest and most stable populations occurring in the Monument Creek watershed (USAFA 2018b).

Following the listing of PMJM in May 1998, USAFA entered formal consultation with USFWS as required by Section 7 of the ESA. In April 2000, USFWS rendered a “no jeopardy” Biological Opinion that addressed USAFA’s Proposed Actions in PMJM habitat. Conditions of the “no jeopardy” Biological Opinion included the development of a conservation agreement, which USAFA and USFWS signed in June 2000 (USAFA 2018b). As part of the 1999 Conservation Plan (USAFA 1999), Mouse Management Areas (MMA) were developed on USAFA. Two MMAs are in Jacks Valley: Monument Creek MMA and Deadman’s Creek MMA (USAFA 1999). The Monument Creek MMA is thought to contain at least 75 percent of the individuals that are estimated to occur installation-wide (USAFA 1999). There are approximately 302 ac of PMJM habitat in Jacks Valley (see **Figures 3-2** and **3-3**).

3.3.1.4 OTHER PROTECTED SPECIES

Other protected species considered in this EA include species protected by the MBTA and the Bald and Golden Eagle Protection Act, and state-listed species. A variety of birds that are protected by the MBTA occur in the region and in Jacks Valley, as discussed previously in **Section 3.3.1.2**, Wildlife. Both the bald and golden eagle have been documented on USAFA during past surveys (USAFA 2018b), and potential nesting habitat does occur in Jacks Valley. Bald eagles nest near large bodies of water, while golden eagles tend to nest on ledges and cliff faces. Suitable habitat for the Moss’ elfin (*Callophrys mossii*), a butterfly that is rare in Colorado, is found throughout Jacks Valley (USAFA 2018b). Habitat for this species includes rocky outcrops, wooded canyons, and cliff areas. Monument Creek, located along the eastern boundary, contains habitat for the following state-listed species of concern: hops azure butterfly (*Celastrina humulus*), southern Rocky Mountain cinquefoil (*Potentilla ambigens*), New Mexico cliff fern (*Woodsia neomexicana*), cedar waxwing (*Bombycilla cedrorum*), gray catbird (*Dumatella carolinesis*), and northern leopard frog (USAFA 2018b).

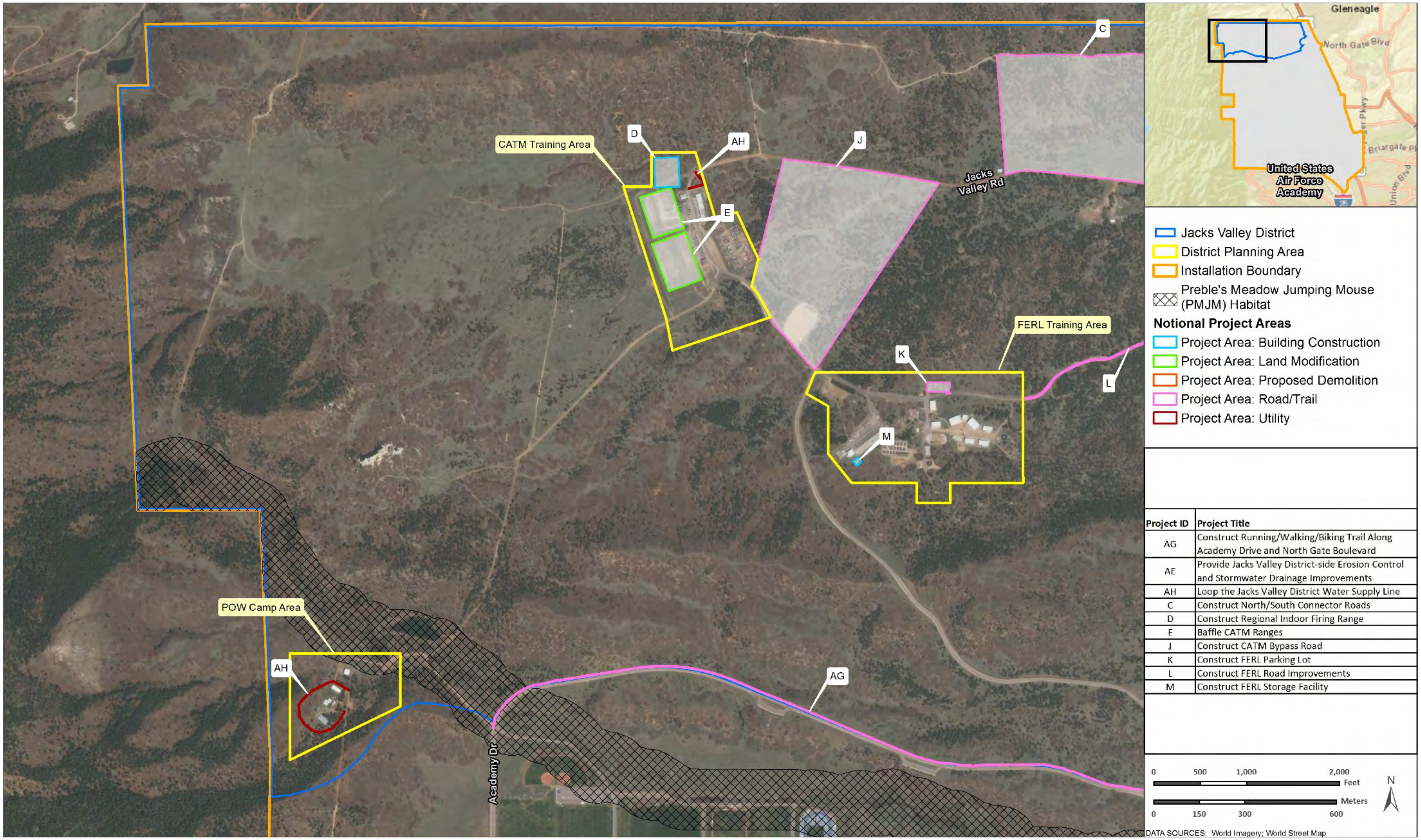


Figure 3-2. Habitat for the Federally Listed Preble's Meadow Jumping Mouse in Jacks Valley (West)

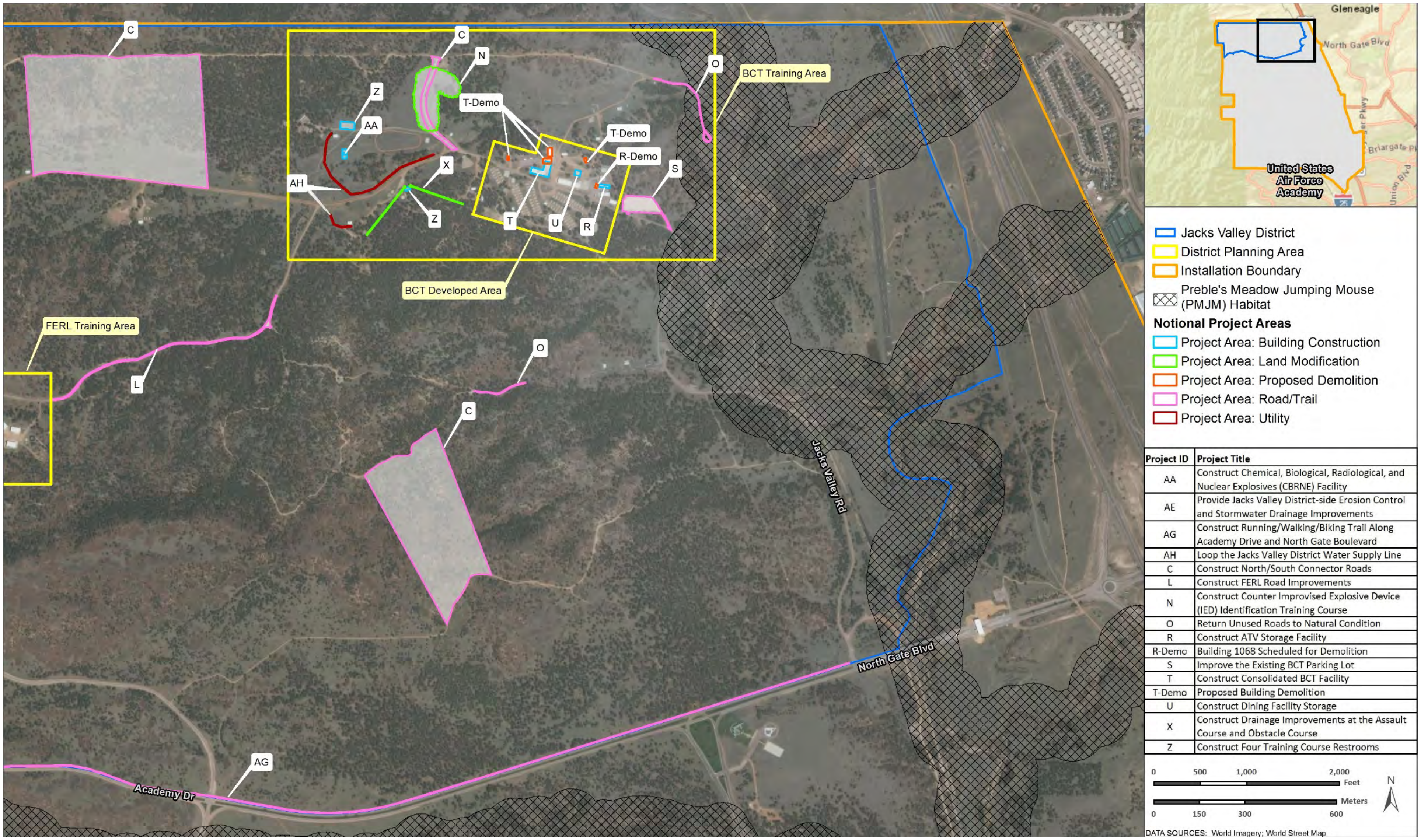


Figure 3-3. Habitat for the Federally Listed Preble's Meadow Jumping Mouse in Jacks Valley (East)

3.3.2 Environmental Consequences

For biological resources, each species has unique, fundamental needs for food, shelter, water, and space and can be sustained only where a specific combination of habitat requirements is available. Removing sustaining elements of a species' habitat impacts the species' ability to exist. Therefore, the evaluation of impacts on biological resources is based on whether the action would cause habitat displacement resulting in reduced feeding or reproduction, removal of critical habitat for sensitive species, and/or behavioral avoidance of available habitat as a result of noise or human disturbance. The level of impacts on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or special habitats are adversely affected over large areas, or if disturbances cause reductions in population size or distribution of a species of special concern.

3.3.2.1 PROPOSED ACTIONS

Vegetation

Short- and long-term, minor, adverse effects as well as long-term, moderate, beneficial effects on vegetation could result from the activities associated with the Proposed Actions in Jacks Valley. Nine Proposed Actions would include construction in areas considered undisturbed vegetation; this includes Projects C, D, J, K, M, U, Z, AA, and AH (see **Tables 2-1, 2-3,** and **2-4**). These projects would result in the permanent removal of up to 10.6 ac of native vegetation and would increase the amount of impervious surfaces in Jacks Valley. Land modification Projects E and N (see **Table 2-2**) would result in 19 ac of temporary and permanent disturbance to vegetation from construction equipment and associated continued use of the land for training activities.

Furthermore, short-term, minor, adverse impacts on vegetation are expected from construction-related equipment and personnel during these activities. Construction activities would result in soil compaction, crushing, and trampling of non-target vegetation within and adjacent to the construction footprint. This disturbance could also result in long-term, minor, adverse effects from the introduction and encroachment of noxious weeds and/or invasive species. BMPs such as inspecting and cleaning construction equipment to remove soil, plants, and seeds; ensuring all fill is as free of nonnative plant propagules as is practicable; and revegetating disturbed areas with native plant species should be implemented during project activities to minimize the spread of noxious weeds and other adverse impacts on vegetation.

Long-term, moderate, beneficial impacts on vegetation are expected from the implementation of demolition Proposed Actions (Projects T and R; see **Table 2-1**) and Project O (see **Table 2-3**) where approximately 4.5 ac of unused roads would be returned to natural conditions. Demolition of impervious surfaces and allowing areas to return to natural conditions would provide areas for native vegetation to reestablish. Areas that are returned to natural conditions should be reseeded with a native species mix.

Wildlife

Short- and long-term, negligible to minor, adverse effects as well as long-term, moderate, beneficial effects on wildlife would occur during activities associated with the Proposed Actions in Jacks Valley. Short-term, minor, adverse effects are expected from increased noise levels. Individuals may temporarily flush from suitable foraging or nesting habitat while equipment is being operated in the area. Furthermore, the increased noise would temporarily inhibit various bird species' ability to detect calls. Calls are important in the isolation of species, pair bond formation, pre-copulatory display, territorial defense, danger, advertisement of food sources, and flock cohesion (FHWA 2004). Noise disturbance is expected to occur only for the duration of construction activities.

Long-term, negligible, adverse effects on wildlife are also expected from the Proposed Actions in Jacks Valley. The development of north/south connector roads (Project C) would fragment habitat in otherwise undeveloped areas in Jacks Valley while also increasing the potential for mortality associated with vehicle strikes. These effects are considered negligible because the training throughput of cadets in Jacks Valley would not increase from current conditions. In addition, BMPs would be implemented, such as enforcement of reduced driving speed, during and after construction to reduce the potential for wildlife and motor vehicle strikes. Long-term, negligible, adverse effects would also result from the increase in impervious surfaces and development. Impervious surfaces would temporarily displace wildlife during construction activities and would permanently displace wildlife after construction is completed. The impacts would be considered negligible considering Jacks Valley is largely undeveloped, with suitable habitat for displaced wildlife species in other areas of Jacks Valley and adjacent forested areas.

Lastly, long-term, moderate, beneficial impacts on wildlife are expected from some of the Proposed Actions involving demolition and Project O where unused roads would be returned to natural conditions. Demolition of impervious surfaces and allowing areas to return to natural conditions would provide areas to reestablish native vegetation, support reduced habitat fragmentation, and enable safer dispersal of wildlife.

Federally Listed Species

As described in **Section 3.3.1.3**, 10 federally listed species are potentially located within the Proposed Action areas, but USAF has determined the Proposed Actions would have no adverse effect on these species. **Table 3-3** lists the species, their federal listing status, their habitat description, and the justification for this "no effect" determination.

Project O (see **Table 2-3**) would occur within PMJM suitable habitat associated with Monument Creek and Deadman's Creek riparian areas, respectively. Long-term, moderate, beneficial effects from natural habitat restoration would be expected from activities associated with Project O (Return Unused Roads to Natural Condition). Project O would restore and revegetate previously disturbed areas along the transitional zone associated with the western edge of the Monument Creek riparian area. These reclamation activities would provide additional upland foraging habitat for PMJM in the future once the roads have been successfully revegetated with native species.

Other Protected Species

Effects on birds protected by the MBTA would be similar to those described for wildlife if these species are present in Jacks Valley during construction activities. However, migratory birds would be expected to temporarily relocate to habitat adjacent to construction areas. Furthermore, applicable BMPs would be implemented to minimize any potential impacts. For example, if construction activities are scheduled to occur during the migratory bird nesting season (April 15 through August 1), pre-construction nest surveys should be conducted in and near construction areas to avoid any potential take under the MBTA. If active nesting behavior is observed, the environmental manger in Jacks Valley should be notified to take the necessary actions.

If Proposed Actions are scheduled to occur in areas where suitable habitat (i.e., Deadman's Creek or along the western boundary along USDA Forest Service property) is present for bald and golden eagles, pre-construction surveys should be conducted to identify any potential active nesting behavior. If nesting activity is observed, a buffer around active nests may be required to avoid potential take under the Bald and Golden Eagle Protection Act. For golden eagles, no activity is permitted within a 0.25-mile radius of active nests. Seasonal restriction to human encroachment within a 0.5-mile radius of active golden eagle nests is from December 15 through July 15. Bald eagle nests have the same buffer distance from October 15 through July 31 (CDOW 2008).

Habitat for species of concern within Monument Creek would not be affected by the Proposed Actions. No activities are expected to occur within Monument Creek, and stormwater measures would be implemented for the Proposed Actions occurring near the creek, including Projects O, S, and AG, to avoid sedimentation during large rainfall events. Similarly, impacts on suitable habitat for the Moss' elfin are not expected. Most of the construction and demolition activities would occur in areas considered non-habitat.

3.3.2.2 PROJECT D1 ALTERNATIVE

Vegetation

Short- and long-term, minor, adverse effects on vegetation would result from the activities associated with the Project D1 Alternative. This project would result in the permanent removal of 30,625 sq ft of vegetation and increased impervious surfaces. Furthermore, short-term, minor, adverse impacts on vegetation are expected from construction-related equipment and personnel during these activities. Construction activities would result in soil compaction, crushing, and trampling of non-target vegetation within and adjacent to the construction footprint. This disturbance could also result in long-term, minor, adverse effects from the introduction and encroachment of noxious weeds and/or invasive species. BMPs mentioned in **Section 3.3.2.1** should be implemented during project activities to minimize the spread of noxious weeds and other adverse impacts on vegetation.

Wildlife

Effects on wildlife would be similar to those described in **Section 3.3.2.1** for the Proposed Actions. Short- and long-term, negligible to minor, adverse effects would occur during construction activities.

Federally Listed Species

No effects on federally listed species are expected from the Project D1 Alternative. This alternative would occur in the CATM training area in the northwest section of Jacks Valley. There is no suitable habitat for PMJM in or near where Project D1 is proposed to be constructed.

Other Protected Species

Effects on other protected species would be similar to those described in **Section 3.3.2.1** for the Proposed Actions.

3.3.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley, but one other reasonably foreseeable project was identified as occurring in the same vicinity, the ABEL program. If construction and demolition activities occur concurrently with ABEL program activities, wildlife that are temporarily displaced from Jacks Valley to USDA Forest Service land could be disturbed from the increased noise and human activity. No overlapping effects on vegetation would be expected. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant effects on biological resources.

3.3.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and the current conditions for biological resources (vegetation, wildlife, federally listed species, and other protected species) would remain unchanged.

3.4 Water Resources

3.4.1 Existing Conditions

3.4.1.1 GROUNDWATER

Jacks Valley is in the Denver Basin aquifer system. The confined aquifer system consists of Upper Cretaceous- to Tertiary-age bedrock sandstones, which underlie about 7,000 square miles of the Great Plains along the eastern front of the Rocky Mountain Front Range. Unconsolidated Quaternary alluvial and eolian deposits overlie the bedrock sandstone aquifers and claystone confining units, and the Quaternary deposits form a productive unconfined alluvial aquifer where saturated, primarily along present-day stream channels. Streams draining eastward into the Denver Basin are generally perennial and originate as snowmelt runoff from the Rocky Mountain Front Range. Streams that originate on the semiarid plains within the Denver Basin are generally ephemeral and intermittent because they receive water primarily from local precipitation runoff and groundwater discharge. Groundwater in alluvial and bedrock aquifer interacts with surface water as streams cross the basin, and there is groundwater movement between the alluvial and bedrock aquifers. The Denver Basin aquifer system is administratively recognized as nonrenewable because the aquifers are primarily confined and receive little precipitation recharge (Paschke et al. 2011).

3.4.1.2 SURFACE WATER AND STORMWATER

The predominant surface water feature on USAFA is Monument Creek, which runs from north to south on the east side of the installation. The headwaters of Monument Creek are in springs in the Rampart Range north and west of the installation. USAFA covers approximately 12 percent of the Monument Creek Watershed, but nearly 75 percent of the watershed's drainage flows though USAFA in Monument Creek before exiting the southern boundary of the installation (USAFA 2018b). The primary surface water feature in Jacks Valley is an unnamed tributary of Monument Creek that flows from west to east out of Rampart Range (URS 2006). Deadman's Creek occurs within Jacks Valley.

3.4.1.3 WETLANDS

In 2002, a wetland delineation was completed for USAFA. A total of 313 wetlands and other waters of the U.S. were identified within USAFA, including 90 in the riverine system and 223 in the palustrine system. The habitats observed in Jacks Valley included wetlands classified as palustrine emergent and palustrine scrub-shrub, and other waters of the U.S. (streams and ponds) classified as intermittent streambeds, upper perennial unconsolidated bottom streams, upper perennial rock bottom streams, palustrine open water ponds, and palustrine aquatic bed ponds (USAFA 2002a). There are approximately 32 ac of wetland features in Jacks Valley including scrub-shrub, emergent, open water, and riverine (see **Figures 3-4** and **3-5**).

3.4.1.4 FLOODPLAINS

Floodplains associated with Monument Creek and its tributaries occur along the eastern and southwestern boundary of Jacks Valley. There are approximately 28 ac of Federal Emergency Management Agency 100-year floodplains in Jacks Valley (see **Figures 3-4** and **3-5**).

3.4.2 Environmental Consequences

Factors considered in determining whether a Proposed Action would have a significant impact on water resources include the extent or degree to which its implementation would result in one or more of the following situations:

- Degrade groundwater, surface water, or coastal water quality in a manner that would reduce beneficial uses of the water
- Reduce the availability of, or accessibility to, one or more of the beneficial uses of a water resource
- Alter the existing pattern of groundwater or surface water flow or drainage in a manner that would affect the uses of the water in or downgradient from the project area
- Be out of compliance with existing water quality standards or with other regulatory requirements related to protecting or managing water resources
- Substantially increase risks associated with human health or environmental hazards
- Increase the hazard of flooding or the amount of damage that could result from flooding, including from runoff or from severe weather events

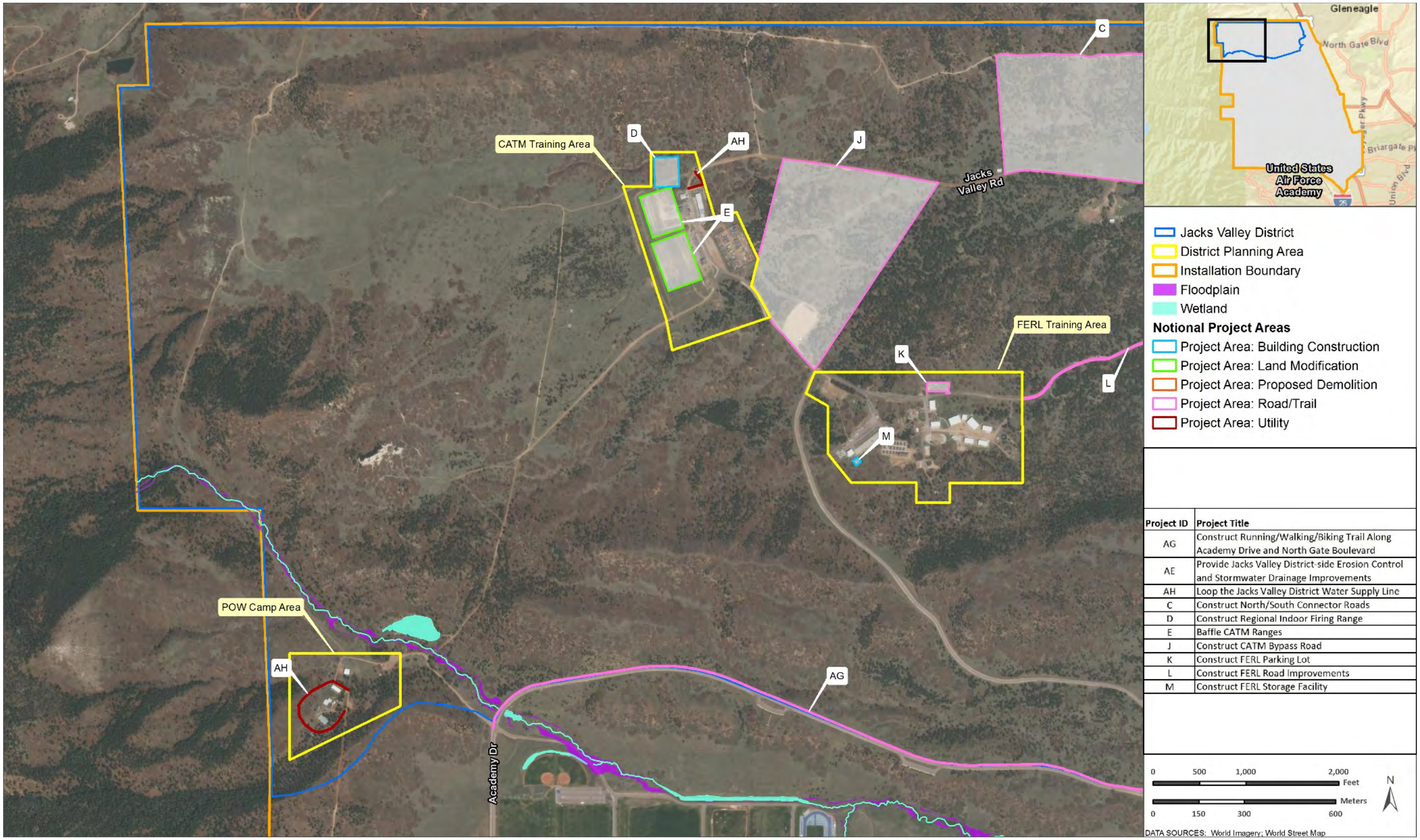
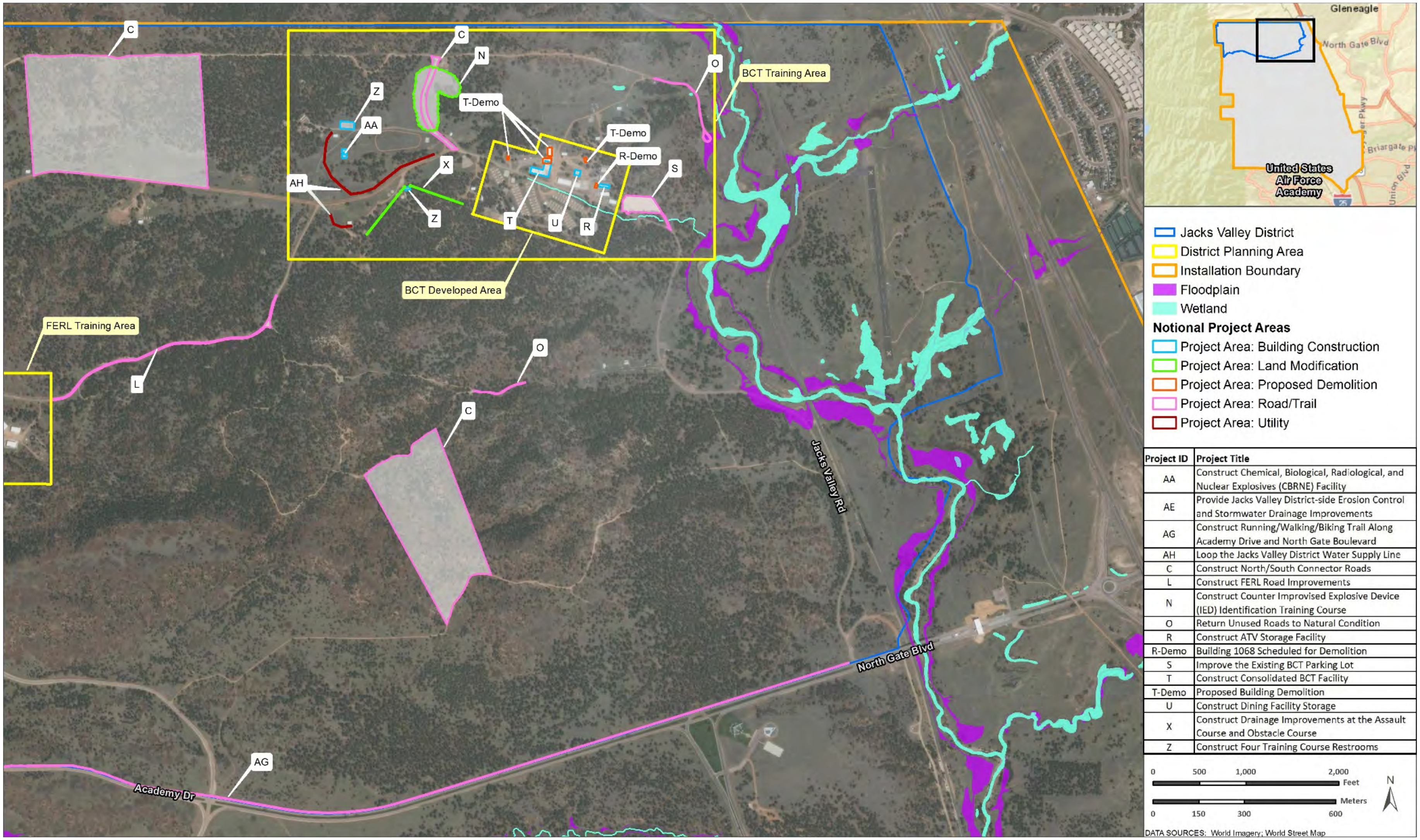


Figure 3-4. Wetlands and Floodplains in Jacks Valley (West)



Project ID	Project Title
AA	Construct Chemical, Biological, Radiological, and Nuclear Explosives (CBRNE) Facility
AE	Provide Jacks Valley District-side Erosion Control and Stormwater Drainage Improvements
AG	Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard
AH	Loop the Jacks Valley District Water Supply Line
C	Construct North/South Connector Roads
L	Construct FERL Road Improvements
N	Construct Counter Improvised Explosive Device (IED) Identification Training Course
O	Return Unused Roads to Natural Condition
R	Construct ATV Storage Facility
R-Demo	Building 1068 Scheduled for Demolition
S	Improve the Existing BCT Parking Lot
T	Construct Consolidated BCT Facility
T-Demo	Proposed Building Demolition
U	Construct Dining Facility Storage
X	Construct Drainage Improvements at the Assault Course and Obstacle Course
Z	Construct Four Training Course Restrooms

Figure 3-5. Wetlands and Floodplains in Jacks Valley (East)

3.4.2.1 PROPOSED ACTIONS

Groundwater

Impacts on groundwater resources are not anticipated from the Proposed Actions. Demolition and construction associated with the Proposed Actions (i.e., minor grading, excavation, and foundation preparations for proposed building and infrastructure) would create the potential for soil erosion in Jacks Valley in and near the construction footprint but would not affect the local groundwater table. Because no increases in personnel are expected, withdrawal rates from the Denver Basin aquifer system would not be expected to change.

Based on existing soil conditions and depth to the groundwater table, any incidental contaminant discharges (e.g., fuel, lubricants, coolants) from construction equipment would not be expected to reach the groundwater table given prompt response to potential discharges. Additionally, onsite project personnel would be responsible for ensuring that equipment is in good operating order to reduce the potential for leaks, and would immediately clean up any potential spills in accordance with the *USAF Spill Prevention Control and Countermeasures Pla*n and the *USAFA Hazardous Waste Management Plan* (USAFA 2017).

Surface water runoff would be managed through drainage control measures, with no direct pathways to groundwater recharge points. Through the implementation of stormwater control BMPs, such stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; using erosion control blankets; and adhering to the *USAF Spill Prevention Control and Countermeasures Plan* and the *USAFA Hazardous Waste Management Plan*, there would be no adverse impacts on groundwater from proposed construction.

Surface Water and Stormwater

Short-term, negligible, adverse impacts and long-term, moderate, beneficial impacts on surface water and stormwater would occur from the Proposed Actions. Construction (i.e., minor grading, excavation, and foundation preparations) would result in temporary soil disturbance. Most of the Proposed Actions would not be sited in or adjacent to any surface water features, and implementation of erosion and stormwater control BMPs, such stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; and using erosion control blankets, would reduce the potential for impacts. In addition to BMPs, an Erosion and Sediment Control Plan (ESCP) would minimize sedimentation and erosion in overland flow runoff.

Individual activities that would disturb 1 ac or more of land would be subject to National Pollutant Discharge Elimination System (NPDES) permitting and would require a Construction General Permit. In addition, BMPs would be required to ensure that soils disturbed during construction activities do not impact nearby water bodies. Construction projects that result in soil disturbance require an ESCP, which would include BMPs (e.g., silt fences, straw bales) to manage stormwater flow, minimize sedimentation, and protect surface water quality. Ensuring onsite stormwater infiltration during construction activities, as required by Section 438 of the Energy Independence and Security Act, would sustain groundwater recharge and minimize stormwater runoff. As a result, no long-term, adverse impacts on surface water would be expected.

Long-term, moderate, beneficial impacts would occur from Project AE (Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements) and Project C (Connect North-South Connector Roads). The projects would implement BMPs across the Jacks Valley District to provide for better erosion control and stormwater management, and to eliminate erosion and sedimentation from unauthorized trails.

Wetlands

Long-term, minor, beneficial impacts on wetlands would occur from the Proposed Actions. Most of the activities associated with the Proposed Actions would not be sited in or adjacent to any wetland features, and implementation of BMPs and an ESCP would minimize sedimentation and overland flow runoff during construction. Projects AG and O (see **Table 2-3**) would be constructed and operated adjacent to wetland areas (see **Figures 3-4** and **3-5**). Under Project AG, the proposed trail along Academy Drive and North Gate Boulevard would cross the wetland complex associated with Deadman's Creek, but it would be constructed within the shoulder of the road, resulting in an up to 10-foot-wide disturbance. During construction activities, stormwater runoff would be prevented from flowing into adjacent wetlands through the use of erosion and stormwater control BMPs in conjunction with an ESCP, as discussed above. The eastern edge of Project O is adjacent to wetlands associated with Monument Creek. Impacts on wetlands from demolition actions to break up the existing compacted dirt roads associated with Project O would be controlled through the use of BMPs and an ESCP, and long-term impacts from the resulting reestablishment of a natural area would be beneficial.

Floodplains

Short-term, negligible, adverse impacts on floodplains would occur from the Proposed Actions. Most of the projects would not be sited in or adjacent to the floodplains, and implementation of BMPs and an ESCP would minimize sedimentation and erosion in overland flow runoff into floodplains. A portion of Project O (Return Unused Roads to Natural Condition) in the BCT training area is within a floodplain; therefore, this project has the potential for disturbance within a floodplain. During the breakup of these dirt roads, USAF would implement erosion and stormwater control BMPs, such stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; and using erosion control blankets. After road demolition, this area would be allowed to return to natural habitat through native seeding and plantings, and there would be no change in floodplain hydrology. There is no practicable alternative available to avoid affecting floodplains because Project O would return an existing road to natural conditions; this unused road is in a fixed location, and no other alternatives were identified.

3.4.2.2 PROJECT D1 ALTERNATIVE

Groundwater

Similar impacts to those described in **Section 3.4.2.1** for the Proposed Actions would be expected for the Project D1 Alternative.

Surface Water and Stormwater

Short-term, negligible, adverse impacts on surface water and stormwater would occur from the Project D1 Alternative. Construction (i.e., minor grading, excavation, and foundation preparations) would result in temporary soil disturbance. This project is not sited in or adjacent to any surface water features, and implementation of BMPs and an ESCP would minimize sedimentation and erosion in overland flow runoff.

Wetlands

No effects on wetlands would be expected from the Project D1 Alternative. The project is approximately 0.5 mile from the nearest wetland; therefore, it would not be sited in wetlands. Siting of the firing range would include the implementation of stormwater controls and associated BMPs.

Floodplains

No effects on floodplains would be expected from the Project D1 Alternative. The project is approximately 1 mile from the nearest floodplain; therefore, it would not be sited in floodplains. Siting of the firing range would not be expected to divert flow or alter floodwater volume or velocity, and designs would include implementation of stormwater controls and associated BMPs.

3.4.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on water resources.

3.4.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and current conditions for water resources (groundwater, surface water and stormwater, wetlands, and floodplains) would remain unchanged.

3.5 Geology and Soils

3.5.1 Existing Conditions

3.5.1.1 GEOLOGY AND TOPOGRAPHY

The physiography of USAFA consists of a series of west-east trending ridges interspersed by valleys. The western boundary of the west-east trending mesas and valleys is formed by an abrupt north-south trending ridge of sedimentary rock, with the steep slopes of the Rampart Range forming the visual and physical backdrop to USAFA. Elevations range from 6,376 ft above mean sea level at Monument Creek near the South Gate to 7,800 ft above mean sea level at the base of the Rampart Range at Stanley Canyon (USAFA 2018b).

The dominant geologic influence and physiographic feature in the USAFA area is the Pikes Peak batholith, a mass of magma that pushed its way upward through existing rock approximately 1 billion years ago. The resulting rock type, reddish-pink Pikes Peak granite, is prevalent on the installation. An associated formation, the Dawson Arkose, underlies much of USAFA and is visible in multiple areas, especially along Monument Creek where it is exposed. Dawson Arkose also occurs in several picturesque geologic monuments known locally as hoodoos, including Cathedral Rock on the western end of Jacks Valley. These formations consist of sandstones that have been created by the weathering of the Pikes Peak granite (USAFA 2018b).

In Jacks Valley, Pikes Peak granite forms the mountains of the Rampart Range along the western boundary of USAFA. The Rampart Range Fault, a high-angle reverse fault, separates the harder igneous rocks of the Rampart Range from the softer sedimentary rocks of the foothills and plains to the east, resulting in a dramatic change from steep to more gradual slopes. The predominant geologic unit east of the Rampart Range Fault is the Dawson Formation, which is composed of 2,000-foot-thick deposits of weakly cemented, arkosic sandstones, siltstones, and shales. Narrow mesas and broad valleys, which terminate at Monument Creek to the east, are remnants of eastward-trending pediments. In the lower elevations, Quaternary alluvial and eolian deposits form a thin cover over the upper surface of the Dawson Formation (URS 2006).

3.5.1.2 SOILS

Soils in Jacks Valley can be described as deep or moderately deep, and somewhat excessively drained or well drained. These soils were formed in parent material weathered from acid igneous rock and sandstone sedimentary rock. Landscape features include alluvial fans, terraces, ridges, and side slopes of mountains and foothills. The surface horizons of these soils have a gravelly sandy loam, sandy loam, or a loamy sand texture. **Table 3-4** summarizes the Natural Resources Conservation Service (NRCS) soil mapping units in Jacks Valley (URS 2006). Erosion issues in Jacks Valley are more likely to occur on tilled firebreak areas, on unimproved roadways, near stream beds, and near other barren areas (USAFA 2018b).

Most of the soils along the western boundary of USAFA are gravelly sandy loam. These soils formed in igneous parent material on the steep side slopes and alluvial fans of the Rampart Range. Moving east, the soils transition to sandy loam or loamy sand soils formed in sedimentary parent material on the sloping to nearly level foothills along Monument Creek. The area in and surrounding the CATM (western Jacks Valley) has higher than average erodibility than other areas at USAFA. The CATM training area also has the highest potential for soil loss compared to other areas in Jacks Valley due to steeper slopes (URS 2006).

Table 3-4. Soil Mapping Units in Jacks Valley

Hydrologic Soil Group [a]	Soil Mapping Unit	Percent Slope	Depth to Water Table (inches)	Drainage	Runoff Class
B	Ascalon sandy loam	3 to 9	More than 80	Well drained	Medium
A	Columbine gravelly sandy loam	0 to 3	More than 80	Well drained	Very low
C	Cushman loam	5 to 15	More than 80	Well drained	Medium
A	Ellicott loamy coarse sand	0 to 5	More than 80	Somewhat excessively drained	Very low
B	Jarre gravelly sandy loam	1 to 8	More than 80	Well drained	Medium
B	Jarre-Tecolote complex	8 to 65	More than 80	Well drained	High
B	Kettle gravelly loamy sand	3 to 8	More than 80	Somewhat excessively drained	Low
B	Kettle gravelly loam sand	8 to 40	More than 80	Somewhat excessively drained	Medium
D	Kettle-Rock outcrop complex		More than 80	Somewhat excessively drained	Medium
B	Pring coarse sandy loam	3 to 8	More than 80	Well drained	Low
B	Pring complex, coarse sandy loam	8 to 15	More than 80	Well drained	Low
B	Tomah-Crowfoot loamy sands	3 to 8	More than 80	Well drained	Medium
B	Tomah-Crowfoot complex	8 to 15	More than 80	Well drained	Medium
B	Security very gravelly coarse sandy loam	40 to 65	More than 80	Well drained	High
D	Sphinx-Rock outcrop complex	15 to 80	More than 80	Somewhat excessively drained	Very high
B	Telecote very gravelly sandy loam, very stony	15 to 40	More than 80	Well drained	Medium
B	Telecote very gravelly sandy loam, very stony	40 to 70	More than 80	Well drained	Medium
B	Tomah sandy loam	2 to 15	More than 80	Well drained	Medium

Sources: NRCS 2021a and 2021b

[a] Hydrologic soil groups in the United States are assigned to four groups (A, B, C, and D) by NRCS.
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained, or well drained soils that have moderately fine texture to moderately coarse texture.
Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
Group D. Soils with a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of soils including clays with a high shrink-swell potential, high water table, clay layer near the surface, and shallow over nearly impervious material.

3.5.1.3 PRIME FARMLAND

None of the soils mapped in Jacks Valley are considered prime farmland soils by NRCS. Because the area has been and continues to be used as a military installation and agricultural activities presently do not occur and are not planned, these soils are not available for agricultural use.

3.5.1.4 GEOLOGIC HAZARDS

The diverse geologic structures, rocks, soil types, topography, and climatic conditions in Jacks Valley present potential geologic hazards, including floods, landslides, debris flows, earthquakes, and swelling soils. The Colorado Geological Survey conducts studies on the state's geologic hazards and monitors areas susceptible to hazards and disasters through the use of geographic information systems. Overall, Jacks Valley is in a geologically and seismically stable location. However, the northeastern area of Jacks Valley has been identified by the Colorado Geological Survey as a potential area for floods. The area along Monument Creek is within the 100-year floodplain, which places part of Jacks Valley at risk for potential flooding (CGS 2021).

3.5.2 Environmental Consequences

Impacts on geologic resources are evaluated based on their potential impacts on geology, topography, soils, and geologic hazards. Impacts might arise from disturbance of soils during construction, increased aerial and water erosion from construction and operations, impacts on unique geologic features, impacts on the geologic environment resulting in increased hazards, and changes in topography on a large scale. An effect might be considered adverse if a Proposed Action would result in long-term changes to the environment, loss of unique and sensitive soils, or geologic features. A Proposed Action could have a significant effect on geologic resources if one or more of the following were to occur:

- Substantial destabilization of soils
- Changes affecting local and regional geology
- Removal of unique geologic features

3.5.2.1 PROPOSED ACTIONS

Short- and long-term, negligible to minor, adverse impacts would be expected on topography, soils, and geologic hazards from demolition, site preparation (grading and excavating), construction, and land modification activities under the Proposed Actions. To reduce adverse impacts as a result of soil erosion and sedimentation, USAFA would implement erosion and stormwater control BMPs such as stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; and using erosion control blankets.

Geology

No impacts on geology would occur from the Proposed Actions. Some construction activities would likely include foundations and/or supports installed into the subsurface, but no geologic foundations would substantially be altered. Geotechnical analysis should be undertaken for each construction footprint so that site development precautions can be applied during the planning stage.

Topography

Short- and long-term, negligible, adverse impacts would be expected on the natural topography in Jacks Valley from demolition and site preparation (grading, excavating, recontouring) activities under the Proposed Actions. The topography in Jacks Valley varies; however, most of the facility construction activities would occur in areas that have been developed or are considered previously disturbed areas. Impacts would primarily occur from demolition (bare areas that would be revegetated) and land grading activities during construction. Long-term, negligible, adverse impacts on topography would occur during the implementation of Projects D, M, Z, AA, C, J, and K (see **Tables 2-1** and **2-3**). These projects would occur in undisturbed areas, and minimal grading and recontouring efforts could alter the topography within the construction footprint. These impacts are considered negligible because the overall topography in Jacks Valley would not be altered.

Soils

Short- and long-term, minor, adverse impacts as well as long-term, moderate, beneficial impacts on soils would be expected from the implementation of the Proposed Actions. Short- and long-term, minor, adverse impacts on soils would occur from soil compaction, disturbance, and erosion under the Proposed Actions, including Projects C, J, and T (see **Tables 2-1** and **2-3**). Heavy rain events could potentially cause erosion of unstable embankments and bare soil during excavation and grading activities. However, most of the construction would occur in previously disturbed areas. Impacts would be minimized through the implementation of environmental protection measures, such as USAFA's erosion and stormwater control BMPs and an ESCP. Compaction of soils from heavy equipment would result in disturbance and modification of soil structures. Soil productivity would decline in disturbed areas and would be permanently lost within facilities' footprints, pavements, roadways, and trails. Temporary loss of soil structure due to compaction from foot and vehicle traffic could result in changes in drainage patterns but could be minimized by soil decompaction methods. Long-term, moderate, beneficial impacts on soils would occur from the drainage improvements identified for Projects X and AE (see **Table 2-2**) within their identified areas by improving runoff and minimizing sedimentation.

Geologic Hazards

Short-term, negligible to minor, adverse impacts on geologic hazards would occur from the Proposed Actions. Although Jacks Valley is in a geologically and seismically stable location, potential adverse impacts on humans and property could occur in the event of a flood. In the eastern part of Jacks Valley along Monument Creek, a portion of Project O (Return Unused Roads to Natural Condition) is within the 100-year floodplain, which places Jacks Valley at risk for potential flooding. The road improvements would return soils to their natural conditions, but would not change flooding potential within the planned area for Project O. During the implementation of the Proposed Actions, no geologic hazards would be created or exacerbated. No long-term impacts prompting increased geologic hazards would be expected from operations and activities under the Proposed Actions.

Long-term, minor, beneficial impacts on geologic hazards would occur from the Proposed Actions. Reestablishing the area for Project O with natural habitat and native seeding and plantings would help address erosion issues with unimproved roads and barren areas in Jacks Valley due to lack of vegetation and reduced infiltration.

3.5.2.2 PROJECT D1 ALTERNATIVE

Geology

No short- or long-term impacts on geology would occur from the Project D1 Alternative. The proposed indoor training range facility would likely include foundations and/or supports installed into the subsurface. However, impacts on geologic resources would be negligible from implementing the Project D1 Alternative because no geologic foundations would substantially be altered.

Topography

Short-term, negligible, adverse impacts would be expected on the natural topography as a result of site preparation (grading, excavating, recontouring), construction, and land modification activities under the Project D1 Alternative. The topography of USAFA varies with mesas and valleys; however, construction activities would occur on mostly previously disturbed areas within the Project D1 Alternative footprint. Therefore, minimal change in topography would be expected.

Soils

Short- and long-term, minor, adverse impacts on soils would occur from soil compaction, disturbance, and erosion under the Project D1 Alternative. The soils in the project area consist of sandy loam with a 3 to 8 percent slope and a medium runoff class. Heavy rain events could potentially cause erosion of unstable embankments and bare soil resulting from excavation and grading activities. However, construction for the Project D1 Alternative would occur within a previously disturbed area identified in the JVDP as “developable” in the CATM training area. Impacts would be minimized through the implementation of environmental protection measures, such as USAFA’s erosion and stormwater control BMPs.

Geologic Hazards

No impacts on geologic hazards would occur from the Project D1 Alternative. The project site is in a geologically and seismically stable location in Jacks Valley. During the implementation of the Project D1 Alternative, no geologic hazards would be created or exacerbated. No long-term effects prompting increased geologic hazards would be expected from operations of facilities under the Project D1 Alternative.

3.5.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant adverse effects on geology and soils.

3.5.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and current geologic (geology, topography, soils, and geologic hazards) conditions would remain unchanged.

3.6 Cultural Resources

3.6.1 Existing Conditions

The entirety of Jacks Valley is considered the APE for the Proposed Actions to allow for potential future modifications to the Proposed Actions' locations within the constraints of the environmental analysis in this EA.

In 2020, USAFA retained HDR to conduct a survey of archaeological and architectural resources in Jacks Valley in support of the JVDP preparation. Jacks Valley encompasses an area of over 3,300 ac, and the 2020 survey covered an area of 2,678 ac. The remaining 634 ac of Jacks Valley have been inventoried by previous surveys. A total of 18 National Register of Historic Places (NRHP)-eligible, supporting, and "needs data" properties were recorded during the archaeological and architectural surveys of Jacks Valley completed for the Proposed Actions (see **Table 3-5**).

Table 3-5. NRHP-Eligible Sites in Jacks Valley APE

Site No.	Name/Description	Site Type	NRHP Eligibility Status [a]	NRHP Status Date
5EP1003.1	Santa Fe Railroad - Segment	Historical Archaeology	Supporting (F)	2020 [b]
5EP2000	Open Camp	Prehistoric	Needs Data (F)	1992
5EP2004	Grave Site	Historical Archaeology; Historical	Needs Data (O)	2013
5EP2012	Open Camp	Prehistoric	Eligible (O)	2008
5EP2014	Lime Kiln and Artifact Scatter	Historical Archaeology; Historical	Needs Data (F)	1992
5EP2015	Potential Kill Site	Prehistoric	Needs Data (F)	1992
5EP2020	Cathedral Rock	Prehistoric; Historical Archaeology	Eligible (O)	2009
5EP2021	Prehistoric Debitage, Historical Homestead and Artifact Scatter	Prehistoric; Historical Archaeology	Eligible (O)	2013
5EP2181.3	Denver & Rio Grande Railroad Grade - Segment	Historical Archaeology; Historical	Supporting (F)	2020 [b]
5EP2243	Foundation and Artifact Scatter	Historical Archaeology; Historical	Eligible (F)	2020 [b]
5EP8304.2	North Gate Boulevard - Segment	Historical	Supporting (F)	2020 [b]
5EP8847	Building 10554 Northgate Boulevard Bridge (Eastbound)	Historical	Eligible (O)	2020
5EP8848	Building 10553 Northgate Boulevard Bridge (Westbound)	Historical	Eligible (O)	2020
5EP8918.1	Road - Segment	Historical Archaeology	Supporting (F)	2020 [b]
MM-008	Providence Way	Historical	Unevaluated	2020 [b]
MM-012	Providence to CATM	Historical	Unevaluated	2020 [b]
MM-014	FERL Road	Historical	Unevaluated	2020 [b]
MM-015	Jacks Valley Road	Historical	Unevaluated	2020 [b]

[a] F = Field recommendations; O = Official SHPO determinations.

[b] Eligibility determinations are pending SHPO consultation and concurrence.

3.6.1.1 ARCHAEOLOGICAL AND TRADITIONAL CULTURAL PROPERTIES

A total of 16 of the 18 NRHP-eligible, supporting, and "needs data" properties identified in Jacks Valley were recorded in the 2020 archaeological survey. The archaeological survey included the relocation and re-evaluation of 60 previously recorded archaeological cultural resources (HDR 2021). One of the previously recorded archaeological sites, 5EP2243, is considered eligible for listing in the NRHP, and one of the previously recorded archaeological sites, 5EP2181.3, is considered a supporting segment of the potentially NRHP-eligible Denver and Rio Grande Railroad. In addition, one newly recorded site, 5EP8304.2, a segment of North Gate Boulevard identified as supporting, is considered a supporting resource. Lastly, four unevaluated sites (MM-008, MM-012, MM-014, and MM-015) are roads associated with the development of Jacks Valley and are potentially more likely to be NRHP-eligible. SHPO considers all linear sites not recorded for their entire length eligible for the purposes of Section 106 consultation.

TCPs and sacred sites are a special class of cultural resources that require specialized expertise in their identification and assessment. Currently no TCPs or sacred sites have been formally identified at USAFA. However, several sites have been identified as potential TCPs, which require protection by USAFA (USAFA 2019a). The locations of those resources are considered highly confidential to many of USAFA's culturally affiliated tribes. Information about potential TCPs and sacred sites is not for public distribution without individual consultation with USAFA to determine the intent of the interest. As such, the information assembled in past archaeological, ethnographic, and ethnobotanical surveys regarding potential TCPs and sacred sites is used for site protection measures only.

3.6.1.2 ARCHITECTURAL PROPERTIES

Two of the 18 NRHP-eligible, supporting, and "needs data" properties identified in Jacks Valley were recorded in the architectural survey (HDR 2020). The architectural survey report provides an inventory and evaluation of all architectural resources in Jacks Valley that were built during the Cold War era (1958–1991) as well as any facilities constructed after 1991 that research and fieldwork indicated may hold potential for NRHP eligibility under Criteria Consideration G. Additionally, Jacks Valley was newly evaluated during this investigation for historic district potential. This report concludes that because of a combined lack of significance and integrity, the surveyed architectural resources in Jacks Valley hold no NRHP historic district potential.

Building 10553 Northgate Boulevard Bridge (Westbound) (5EP8848) and Building 10554 Northgate Boulevard Bridge (Eastbound) (5EP8847) are recommended as individually eligible for listing in the NRHP for significance under Criteria A and C. No other surveyed resources are recommended eligible or as contributing to the significance of the proposed potential USAFA Historic Cultural Landscape District (5EP595). No additional NRHP-eligible historic districts in Jacks Valley are recommended based on the results of the architectural survey.

3.6.2 Environmental Consequences

Effects analysis under Section 106 is limited to cultural resources that meet the NRHP eligibility criteria. Effects analysis under NEPA may include cultural resources that have not been evaluated or do not meet NRHP criteria but may be significant to tribes or other ethnic or religious groups for traditional, religious, or cultural purposes.

To be listed in, or considered eligible for listing in, the NRHP, a cultural resource must typically be 50 years of age or greater and have significant associations with historic themes or events (Criterion A) or historical persons (Criterion B); be significant for its architectural or engineering design or construction type, period, or method (Criterion C); or have the potential to yield important information in prehistory or history (Criterion D). An NRHP-eligible resource must also retain historic integrity in seven aspects to be able to convey its historical significance (NPS 1997). Certain types of properties (e.g., religious, commemorative, less than 50 years of age) are typically not eligible for NRHP listing but may qualify under certain considerations. Properties less than 50 years of age most hold exceptionally significant historical associations (Criteria Consideration G). Cultural resources meeting these standards (age, significance, and integrity) are determined eligible for listing in the NRHP and are termed “historic properties” under the NHPA. Sites or structures that are not considered individually significant may be considered eligible for listing in the NRHP as part of a historic district. According to the NRHP, a historic district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects that are historically or aesthetically united by plan or physical development.

Under Section 106 of the NHPA and its implementing regulations, an adverse effect is found when an undertaking (or action) may alter, directly or indirectly, any of the characteristics of a historic property that qualify it for NRHP eligibility in a manner that would diminish the property’s historic integrity of location, setting, feeling, association, design, materials, or workmanship. Examples of adverse effects on cultural resources under Section 106 include the following:

- Physically altering, damaging, or destroying all or part of a resource
- Altering characteristics of the surrounding environment that contribute to the resource’s significance
- Introducing visual or audible elements that are out of character with the property or that alter its setting
- Neglecting the resource to the extent that it deteriorates or is destroyed
- Selling, transferring, or leasing the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property’s historic significance

Adverse effects determined under Section 106 may or may not be considered significant impacts under NEPA, and considerations include the type, duration, and severity of the impacts as well as mitigation measures developed through Section 106 consultation.

3.6.2.1 SECTION 106 CONSULTATION

The USAF is complying with Section 106 for the JVDP through consultation with SHPO and federally recognized tribes historically affiliated with the APE, and development of a project-based Programmatic Agreement (PA) under provisions of 36 CFR § 800.14(b)(3).

The PA phases the Section 106 consultation for 18 of 33 Proposed Actions in the JVDP, allowing for consultation on individual or multiple actions simultaneously with each consultation based on an APE specific to that project or projects. During the development of the PA, the following tribes responded and requested to be Concurring Parties for the PA: the Northern Cheyenne Tribe; the Pawnee Nation of Oklahoma; the Pueblo of Santa Clara; the Rosebud Sioux Tribe of the Rosebud Indian Reservation; the Southern Ute Indian Tribe; the Standing Rock Sioux Tribe; the Ute Mountain Ute Tribe, and the Yankton Sioux Tribe. Consultation with the SHPO and Concurring Parties regarding the PA is in progress, and the PA will be executed prior to public release of the Final EA and signature of the FONSI (including FONPA statement).

For the remaining 15 of 33 Proposed Actions in the JVDP not addressed in the PA, USAF has determined that each Proposed Action (i.e., undertaking) would have no effect on historic properties due to the scope, scale, and types of Proposed Actions. On July 22, 2021, USAF received concurrence from SHPO on the no effect determinations for these 15 projects (see **Appendix F**), with further Section 106 compliance for those projects limited to the possibility of post-review discoveries after signature of the PA. USAF also received responses from the following tribes: the Comanche Nation; the Eastern Shoshone Tribe; the Navajo Nation; the Pueblo of Santa Ana; the Santa Clara Pueblo; and the Ute Mountain Ute Tribe. Each tribe concurred that no historic properties would be affected, or that there would be no adverse effect to historic properties.

3.6.2.2 PROPOSED ACTIONS

Although Section 106 compliance for the JVDP is being completed through both a PA and no effect determinations as described in **Section 3.6.2.1**, analysis of effects on cultural resources under NEPA is presented here. Short-term, negligible to minor, adverse impacts on cultural resources would be expected from construction activities during implementation of the Proposed Actions. Of the 18 NRHP-eligible, supporting, and "needs data" properties recorded during the 2020 cultural resources surveys of Jacks Valley, four overlap with components of the Proposed Actions as described in **Section 3.6.1**: MM-008, MM-012, MM-014, and MM-015. These resources are all segments of roads associated with the development of Jacks Valley. The roads have not been evaluated in their entirety and are treated as NRHP-eligible for the purposes of the Section 106 review per SHPO guidelines. One historic property, Site 5EP8304.2, a 1.4-mile long supporting segment of NRHP-eligible North Gate Boulevard, is adjacent to Project AG (Construct a Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard).

Two of the road and trail improvements Proposed Actions (Projects J and L; see **Table 2-3**) would involve segments of the four NRHP-eligible roads. The proposed CATM Bypass Road (Project J) would be unpaved, and potential impacts on NRHP-eligible roads would be limited to the intersections with Project J. Project L would involve paving only along portions of existing roads in the FERL training area that are currently paved, and impacts would be limited. Additionally, Project AG would involve construction of an unpaved trail along Jacks Valley Road (Site MM-015); however, no impacts on this site are anticipated as the road itself is not included in the Proposed Action.

As currently described, none of the components of the Proposed Actions would alter the alignment, width, use, or materials of the existing roads. Therefore, the Proposed Actions would not alter, directly or indirectly, any of the characteristics that may qualify the historic roads for NRHP eligibility, nor would they diminish the historic integrity of location, setting, feeling, association, design, materials, or workmanship of the historic properties. As such, the Proposed Actions would result in short-term, minor, adverse effects (construction-related disturbances or use of these roads) and would have no significant impacts on known cultural resources.

Potential unanticipated impacts on unknown cultural resources resulting from the Proposed Actions could include ground disturbance during construction and demolition of facilities, land modification, road and trails improvements, and utilities and communications installation. If archaeological deposits are encountered during construction, the standard operating procedure for "Discoveries of Archaeological Resources and Native American Graves Protection and Repatriation Act Cultural Items" in the Integrated Cultural Resources Management Plan for USAFA will be followed (USAFA 2019a).

3.6.2.3 PROJECT D1 ALTERNATIVE

No impacts on cultural resources are expected from the implementation of the Project D1 Alternative. Potential impacts on unknown cultural resources resulting from the Project D1 Alternative include ground disturbance during construction of the proposed facility. If archaeological deposits are encountered during construction, procedures outlined in the Integrated Cultural Resources Management Plan for USAFA would be followed (USAFA 2019a).

3.6.2.4 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley, and no known construction projects are proposed in the location of known historic properties. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on cultural resources.

3.6.2.5 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and the existing conditions discussed in **Section 3.6.1** would remain unchanged.

3.7 Noise

3.7.1 Existing Conditions

Generally, ambient noise levels for the USAFA main installation are similar to those of a commercial / light industrial setting. Noise sources common to USAFA include small trainer aircraft, nontactical vehicles, and routine operation of equipment and machinery (e.g., generators; heating, ventilation, and air conditioning; and construction equipment). Less common noise sources at USAFA are those generated by transient aircraft, such as helicopters, tilt-rotor aircraft, and jets (USAFA 2019b). The 55 A-weighted decibel (dBA) Day-Night Level (DNL) noise contour generated by aircraft operations at the USAFA airfield is over 2 miles away from Jacks Valley.

Noise sources common to Jacks Valley include nontactical vehicles, operation of equipment and heavy machinery, and small arms training. Per AFI 32-1015, *Integrated Installation Planning*, noise studies are required for small arms training facilities; however, a noise study has not yet been developed for small arms training at the CATM training area in Jacks Valley. Small arms training within the CATM training area is a continuation of training that has occurred at USAFA since its inception. USAFA is aware that, because of the east-west orientation of Jacks Valley, firing noise tends to be directed into outlying residential areas to the east. Historically, USAFA has received sporadic calls with complaints about the noise coming from Jacks Valley (USAFA 2002b). The nearest receptors include private residences in the subdivisions north of Jacks Valley, located less than approximately 800 ft from the Jacks Valley northern boundary and approximately 0.5 mile northwest of the CATM training area. To the east, the nearest noise receptors include private residences in the Glen Eagle subdivision, which is less than approximately 1,500 ft from the Jacks Valley boundary across I-25 and is just under 3 miles from the CATM training area. There are no hospitals, schools, or churches within 1 mile of Jacks Valley in any direction. In 2000, USAFA measured baseline noise levels and noise levels during BCT in Jacks Valley; however, these data do not include distances between the source and location measured and therefore are not being relied on to provide existing noise levels for Jacks Valley in this EA.

Environmental noise at USAFA is managed through the DoD Air Installation Compatible Use Zone Program. This program helps mitigate noise and safety concerns for the surrounding communities and advises these communities about potential impacts from flight operations on the safety, welfare, and quality of life of their citizens. USAFA is responsible for flight safety, noise abatement, and participation in existing local jurisdictional land use planning processes as part of its Air Installation Compatible Use Zone Program responsibilities.

3.7.2 Environmental Consequences

An analysis of the potential effects associated with noise typically evaluates potential changes to the existing acoustical environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Effects would be considered significant if noise levels were to be unacceptable to multiple sound receptors or violate noise regulations.

The primary issues concerning noise effects on humans are physiological effects (e.g., hearing loss and non-auditory effects), behavioral effects (e.g., speech or sleep interference and performance effects), and subjective effects such as annoyance. A noise analysis considers potential effects on identified noise-sensitive receptors near a proposed action. The major sources of noise, their contribution to the overall noise environment, and maximum sound level were estimated for comparison to local noise control standards.

3.7.2.1 PROPOSED ACTIONS

Short-term, negligible to moderate, adverse impacts on the ambient noise environment in Jacks Valley and the surrounding communities would occur from the Proposed Actions. Increases in noise levels would occur intermittently and temporarily during demolition and construction. Noise from these activities would vary depending on the type of equipment being used, the area in which the action would occur, and the distance of a receptor from the noise source. Heavy construction equipment would be used periodically during construction; therefore, noise levels would fluctuate. Most equipment used would be expected to produce noise levels between 70 and 95 dBA at a distance of 50 ft (see **Appendix C, Table C-2**). Noise levels at the upper end of this range would be associated with equipment such as pile drivers and would be limited to temporary and intermittent uses. Sound levels on the lower end of the range would be more constant during construction activities. These noise levels would decrease with distance from the Proposed Actions. Noise levels associated with typical construction equipment would noticeably attenuate to below 65 dBA between approximately 500 and 1,000 ft from the source, depending on the equipment in use.

The Proposed Actions closest to noise receptors along the northern boundary of Jacks Valley include Projects D, C, and N (see **Tables 2-1, 2-2,** and **2-3**), which are approximately 2,300 ft, 3,000 ft, and 1,000 ft from private residences, respectively. Because of the distance of Projects D and C from private residences, it is anticipated that noise from construction would be audible but would rarely exceed 65 dBA due to attenuation. Additionally, vegetation between these Proposed Actions and the noise receptors would further muffle noise from construction. Use of clearing and grading and excavation equipment for Project N could exceed 65 dBA at the nearest noise receptor but would be short-term and limited to intermittent use. Use of equipment for building construction would be very limited for Project N because only an overhead cover and small storage facility are proposed as part of Project N. Equipment fitted with noise control devices (e.g., mufflers) and use of sound barriers would lower noise levels from Project N at noise receptors to lower than 65 dBA.

The Proposed Actions closest to noise receptors along the eastern boundary of Jacks Valley are those in the BCT training area; Project O (Return Unused Roads to Natural Condition) is along the eastern boundary of the BCT training area and is approximately 3,700 ft from private residences. At this distance, it is anticipated that noise from construction would be audible but would rarely exceed 65 dBA due to attenuation. Additionally, these residences are adjacent to I-25, and the sound from construction would be muffled by or combined with highway noise, which likely dominates this area.

All other Proposed Actions are located further from noise receptors than Projects D, C, N, and O and therefore would have impacts similar to, but less than, those described for Projects D, C, N, and O. Noise generation would occur only for the duration of construction and would be confined to normal workdays and working hours (i.e., 7 a.m. to 5 p.m.). All applicable noise laws and guidelines would be followed to reduce effects from noise produced by construction activities. Workers would be required to use proper personal hearing protection in accordance with Air Force Occupational Safety and Health Standard 48-20, *Operational Noise and Hearing Conservation Program*, to limit exposure. Appropriate noise attenuation equipment would also be used where applicable.

Long-term, negligible to minor, beneficial impacts on the ambient noise environment in Jacks Valley and the surrounding communities would also occur from Project D (Construct Regional Indoor Firing Range). Once construction of Project D is completed, the project would be used for indoor small arms training. By moving some small arms training to an indoor facility, audible noise from training at the outdoor small arms range would be less frequent for nearby noise receptors.

3.7.2.2 PROJECT D1 ALTERNATIVE

Adverse impacts on the ambient noise environment in Jacks Valley and the surrounding communities from the Project D1 Alternative would be similar to, but less than, those described for the Proposed Actions in **Section 3.7.2.1**. Increases in noise levels would occur intermittently during demolition and construction. The closest noise receptor along the northern boundary of Jacks Valley to the Project D1 Alternative is approximately 4,300 ft. At this distance, it is anticipated that noise from construction would be audible but would rarely exceed 65 dBA due to attenuation. Additionally, vegetation is present between the Project D1 Alternative and noise receptors, which would further muffle noise from construction. As described in **Section 3.7.2.1**, all applicable noise laws and guidelines would be followed, and appropriate noise attenuation equipment would be used, as applicable.

Long-term, negligible to minor, beneficial impacts on the ambient noise environment in Jacks Valley and the surrounding communities would also occur from the Project D1 Alternative. Similar to Project D, once construction on the Project D1 Alternative is completed, the project would be used for indoor small arms training. By moving some small arms training to an indoor facility, audible noise from training at the outdoor small arms range would be less frequent for nearby noise receptors.

3.7.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley, and no known construction projects are proposed in the subdivisions identified as potential noise receptors. Additionally, existing trainer and transient aircraft operations do not generate noise levels that exceed 55 dBA in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant noise effects.

3.7.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and noise conditions in Jacks Valley would remain unchanged.

3.8 Air Quality

3.8.1 Existing Conditions

USAFA is in a portion of El Paso County that the U.S. Environmental Protection Agency (USEPA) has designated as maintenance for carbon monoxide (CO) and unclassified/attainment for all other criteria pollutants[2] (USEPA 2021; CDPHE 2009). Therefore, the USEPA General Conformity Rule is potentially applicable to emissions of CO. As outlined in 40 CFR § 93.153(b), the applicable *de minimis* threshold for CO is 100 tons per year (tpy). To ensure continued attainment for CO emissions, conformity with the State Implementation Plan is evaluated for all Proposed Actions that would take place at the installation.

USAFA is a synthetic minor source of criteria pollutants. There are two permitted air emissions sources at USAFA; these include four industrial boilers at the central heat plant and gasoline storage/transfer at multiple locations throughout the installation. The installation is within allowed levels for emissions from permitted sources (USAFA 2018a). Other air emissions sources at USAFA include emergency generators, boilers and water heaters, abrasive cleaning, solvent cleaning, fire department training, jet engine testing, munitions, surface coating, woodworking, miscellaneous chemical usage, airfield operations, grounds keeping, heavy equipment usage, and motor vehicle activity (USAFA 2018c). **Table 3-6** presents the 2018 air emissions inventory for all stationary air emissions sources at USAFA. No permitted air emissions sources are within the Proposed Action areas.

Table 3-6. 2018 USAFA Air Emissions Inventory in Tons per Year (tpy)

VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
16.689	32.145	27.199	0.493	2.604	2.574

Source: APIMS 2018
VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter measured less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter measured less than or equal to 2.5 microns in diameter

USAFA is a minor source of greenhouse gases (GHG). The central heat plant is the only facility at USAFA that is subject to the Greenhouse Gas Mandatory Reporting Rule and has been reporting emissions since 2010 (USAFA 2018a). In 2019, the facility reported a total of 23,936.1 metric tons of carbon dioxide equivalent (CO_2e) emissions, which was below the reporting threshold (USEPA 2020a).

Foreseeable population growth and associated construction actions in El Paso County may produce new air emissions from mobile, stationary, and transitory sources. These air emissions are unlikely to significantly impact air quality in the region because newer and less emissive sources would replace older and more emissive sources over time. The U.S. Global Change Research Program has examined climate trends in the southwestern United States, including Colorado, and determined that average temperatures have increased by 1 to 2 degrees Fahrenheit in Colorado Springs over the past century. Ongoing climate change has the potential to increase average temperatures, increase the frequency and intensity of droughts and wildfires, disrupt natural ecosystems, decrease air quality, and escalate human vulnerability

2 In addition to CO, criteria pollutants under the Clean Air Act are sulfur dioxide (SO_x), nitrogen dioxide, ozone, 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. See **Appendix C, Section C.3.7** for additional information.

to heat-related illness and chronic disease in the southwestern United States, including El Paso County, Colorado. These climate trends are expected to continue for the foreseeable future (Gonzalez et al. 2018).

3.8.2 Environmental Consequences

Impacts on air quality would be significant if a proposed action were to exceed the applicable significance threshold level. Based on compliance with National Ambient Air Quality Standards (NAAQS), the General Conformity Rule is potentially applicable to emissions of CO, and the *de minimis* threshold for CO is 100 tpy. Should emissions of an attainment pollutant exceed 250 tpy, further investigation would be performed to ensure the new emissions would not interfere with El Paso County's ability to maintain attainment for that NAAQS. Impacts on air quality also would be significant if the emissions from new stationary sources (e.g., boilers, furnaces, electricity generators) were to increase USAFA's potential to emit above major source thresholds. Lastly, significant impacts would occur if a proposed action were to meaningfully contribute to the potential effects of global climate change.

3.8.2.1 PROPOSED ACTIONS

Short-term, minor, adverse impacts on air quality would occur during construction activities associated with the Proposed Actions. Emissions of criteria pollutants and GHGs would be directly produced from activities such as operation of heavy equipment, heavy duty diesel vehicles hauling materials to and from the construction footprint areas, workers commuting daily to and from the construction sites in their personal vehicles, and ground disturbance. However, all such emissions would be temporary in nature and produced only when construction activities are occurring.

The air pollutant of greatest concern is particulate matter, such as fugitive dust. Fugitive dust is generally the largest source of PM_{10} and is generated from ground-disturbing activities and combustion of fuels in construction equipment. 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 greatest during initial site preparation activities and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions.

BMPs (e.g., wetting the ground surface) would be incorporated at construction and demolition areas to minimize fugitive dust emissions. In addition, work vehicles would be well-maintained and would use diesel particulate filters to reduce emissions of criteria pollutants. These BMPs could reduce uncontrolled particulate matter emissions from a construction site by approximately 50 percent depending on the number of BMPs required and the potential for particulate matter air emissions. In accordance with 5 Code of Colorado Regulations § 1001-3(III)(D), construction contractors would limit fugitive dust emissions to the fullest extent feasible and would develop a project-specific fugitive dust control plan, if required. Additionally, an Air Pollutant Emissions Notice for Land Development would be submitted to the Colorado Department of Public Health and Environment for Proposed Actions that would last more than 6 months and would disturb more than 25 ac of land, such as Project AE (Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements). For Proposed Actions with a construction period of less than 6 months and a disturbance area between 1 and 25 ac, a

Construction Activity Permit from El Paso County Public Health would be obtained. Proposed Actions with less than 1 ac of disturbance for less than 6 months would not require a dust permit.

The USAF Air Conformity Applicability Model was used to estimate air emissions from each of the Proposed Actions; the Air Conformity Applicability Model reports are provided in **Appendix G**. For the purposes of the analysis, each Proposed Action was assumed to be implemented over a 1-year construction period with all activities occurring simultaneously; however, the implementation of the Proposed Actions and associated criteria pollutant emissions would realistically occur over a 5-year period. **Table 3-7** lists the estimated air emissions associated with each of the Proposed Actions. No individual Proposed Action would exceed the *de minimis* threshold level of 100 tpy for CO. Therefore, the requirements of the General Conformity Rule would not be applicable.

Table 3-7. Construction Air Emissions in Tons per Year (tpy)

Project ID	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	Lead	CO_2e
D / D1	0.653	1.833	2.015	0.005	1.294	0.075	<0.001	467.2
M	0.239	1.139	1.291	0.003	0.204	0.045	<0.001	320.0
R	0.190	0.957	1.179	0.003	0.109	0.038	<0.001	272.2
T	0.648	1.664	1.908	0.004	0.867	0.068	<0.001	423.5
U	0.231	1.138	1.292	0.003	0.176	0.045	<0.001	319.8
Z	0.204	1.134	1.289	0.003	0.083	0.045	<0.001	318.4
AA	0.239	1.139	1.291	0.003	0.204	0.045	<0.001	320.0
E	0.418	2.620	2.520	0.007	20.907	0.107	<0.001	649.8
N	0.903	5.582	5.208	0.014	78.227	0.227	<0.001	1,418.7
X	0.346	2.039	2.266	0.006	26.083	0.083	<0.001	568.8
AE	0.679	4.103	4.019	0.011	156.190	0.166	<0.001	1,091.2
C	0.310	1.933	1.824	0.005	8.405	0.079	<0.001	489.5
J	0.310	1.933	1.824	0.005	6.391	0.079	<0.001	489.5
K	0.310	1.933	1.824	0.005	3.087	0.079	<0.001	489.5
L	0.418	2.620	2.52	0.007	18.747	0.107	<0.001	649.8
O	0.310	1.933	1.824	0.005	5.799	0.079	<0.001	489.5
S	0.310	1.933	1.824	0.005	7.277	0.079	<0.001	489.5
AG	0.418	2.620	2.520	0.007	29.473	0.107	<0.001	649.8
AH	0.346	2.039	2.266	0.006	32.505	0.083	<0.001	568.8
Total	**7.482**	**40.292**	**40.704**	**0.107**	**396.028**	**1.636**	**<0.001**	**10,485.5**

The General Conformity Rule is not applicable to emissions of volatile organic compounds (VOC), nitrogen oxide (NO_X), sulfur oxide (SO_X), 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 because El Paso County is in attainment/unclassified for those NAAQS. The significance threshold level for these pollutants is 250 tpy (25 tpy for lead). Under all Proposed Actions, emissions of all criteria pollutants would be below the 250 tpy (25 tpy for lead) significance threshold level. To minimize potential impacts of particulate matter, dust control measures would be implemented to the fullest extent feasible, which could reduce PM_{10} emissions by approximately 50 percent. Out of all of the Proposed Actions, Project AE would produce the greatest PM_{10} emissions; however, Project AE is a programmatic action and is unlikely to occur at one time, which would further minimize the effects of fugitive dust.

Long-term, negligible, adverse impacts would occur from operational air emissions associated with new facilities under Projects D, M, R, T, U, Z, and AA (see **Table 2-1**). These Proposed Actions would add new building space to USAFA that would require permanent heating systems, which would produce criteria pollutants. Other Proposed Actions (i.e., land modification, road and trail improvements, and utilities and communications installation) would not produce any operational air emissions. **Table 3-8** summarizes the annual operational air emissions from operation of new facilities. As demonstrated previously in **Table 3-6**, USAFA's synthetic minor permit restrictions would keep the installation sufficiently below major source thresholds to absorb the total new operational air emissions, which would be less than 1 tpy for each criteria pollutant.

Table 3-8. Operational Air Emissions in Tons per Year (tpy)

Project ID	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	Lead	CO_2e
D / D1	0.003	0.152	0.038	0.328	0.009	0.003	<0.001	171.4
M	<0.001	0.023	0.006	0.050	0.001	0.001	<0.001	26.0
R	<0.001	0.013	0.003	0.028	0.001	<0.001	<0.001	14.6
T	0.002	0.161	0.040	0.348	0.008	0.002	<0.001	182.1
U	<0.001	0.019	0.005	0.041	0.001	<0.001	<0.001	21.4
Z	<0.001	0.006	0.001	0.012	<0.001	<0.001	<0.001	6.2
AA	<0.001	0.023	0.006	0.050	0.001	0.001	<0.001	26.0
Total	**0.005**	**0.397**	**0.099**	**0.857**	**0.021**	**0.007**	**<0.001**	**447.7**

Related to climate change and GHGs, construction and demolition associated with each of the Proposed Actions would produce a total of 10,485.5 tons of CO_2e. CO_2e emissions would be distributed over a 5-year period. Operation of the new facilities would emit 447.7 tons of CO_2e per year once all new facilities are operational. By comparison, 500 tons of CO_2e is approximately the GHG footprint of 109 passenger vehicles driven for 1 year or 60 homes' energy use for 1 year (USEPA 2021b). As such, the GHG emissions from implementation of each individual Proposed Action and GHG emissions from operation of new facilities would not meaningfully contribute to the potential effects of global climate change.

Ongoing changes to climate patterns in the southwestern United States are described in **Section 3.8.1**. These climate patterns and foreseeable climate trends, such as increased average temperatures and increases in the frequency and intensity of droughts and wildfires, are unlikely to affect USAFA's ability to implement the Proposed Actions, and the actions would not appreciably contribute to the regional (i.e., southwestern United States) impacts from global climate change because of insignificant CO_2e emissions. Many of the Proposed Actions would be sited near forested areas, which could be subject to increased potential for wildfire from climate change. To reduce wildfire risk, USAFA follows a Wildfire Management Plan and implements forest management practices. In addition, all installation firefighters receive wildland firefighting training and certification (USAFA 2018a). Therefore, climate change would not likely affect USAFA's ability to implement the Proposed Actions.

3.8.2.2 PROJECT D1 ALTERNATIVE

Short-term, minor, adverse impacts on air quality from the Project D1 Alternative would be identical to those described in **Section 3.8.2.1** for the Proposed Actions. Construction of the regional indoor firing range under the Project D1 Alternative would produce criteria pollutants and GHGs. **Table 3-7** lists the estimated air emissions associated with the Project D1 Alternative. All such emissions would be temporary in nature and produced only when construction activities are occurring. BMPs, such as those listed for the Proposed Actions, would be implemented to minimize fugitive dust and reduce air emissions. The Project D1 Alternative would not exceed the *de minimis* threshold level of 100 tpy for CO. Emissions from all other criteria pollutants would be below the 100 tpy *de minimis* surrogate threshold. Therefore, the requirements of the General Conformity Rule would not be applicable. Emissions from all other criteria pollutants would be below the 250 tpy (25 tpy for lead) significance threshold level.

Long-term, negligible, adverse impacts on air quality from the Project D1 Alternative would be identical to those described for the Proposed Actions. The Project D1 Alternative would add building space to USAFA that would require a permanent heating system that would produce criteria pollutants. Annual operational air emissions from the regional indoor firing range under the Project D1 Alternative are listed in **Table 3-8**. As demonstrated in **Table 3-6**, USAFA is sufficiently below major source thresholds to absorb the new operational air emissions, which would be less than 0.2 tpy for each criteria pollutant.

Related to climate change and GHGs, construction and operation of the regional indoor firing range under the Project D1 Alternative would produce a total of 638.6 tons of CO_2e, which is the equivalent of approximately 139 cars driven for 1 year or 77 homes' energy use for 1 year (USEPA 2021b). As such, GHG emissions from the Project D1 Alternative would not meaningfully contribute to the potential effects of climate change. As stated for the Proposed Actions, climate patterns and foreseeable climate trends are unlikely to affect USAFA's ability to implement the district development projects, including the Project D1 Alternative, and the project would not appreciably contribute to the regional impacts from global climate change.

3.8.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction or demolition activities that would produce air emissions are proposed in Jacks Valley, and no known construction projects are proposed in the surrounding area. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on air quality. Foreseeable climate trends in the southwestern United States are discussed in **Section 3.8.1** and are not expected to affect the Proposed Actions.

3.8.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and air quality conditions in Jacks Valley would remain the same as described in **Section 3.8.1**. Air emissions from implementation of the Proposed Actions and operation of new facilities would not occur.

3.9 Health and Safety

3.9.1 Existing Conditions

USAFA is a secure military installation that limits access to only authorized personnel. The installation provides emergency services, including fire response, emergency medical services, law enforcement, and force protection to all installation facilities. Therefore, emergency situations can be responded to quickly (USAF 2020; USAFA 2018a).

Contractors performing construction activities on USAF installations, including USAFA, are responsible for following federal Occupational Safety and Health Administration regulations and are required to conduct these activities in a manner that does not increase risk to workers or the public. Construction contractors are responsible for reviewing potentially hazardous workplace conditions; monitoring worker exposure to workplace chemical (e.g., asbestos, lead, hazardous substances), physical (e.g., noise propagation, falls), and biological (e.g., infectious waste, wildlife, poisonous plants) agents and ergonomic stressors; and recommending and evaluating controls (e.g., preventive, administrative, engineering, personal protective equipment) to ensure exposure to personnel is limited or adequately controlled. Additionally, employers are responsible for ensuring a medical surveillance program is in place to perform occupational health physicals for those workers subject to the use of respiratory protection or engaged in work with hazardous waste, asbestos, lead, or other work requiring medical monitoring.

USAF has policies and regulations developed to protect workers associated with USAF activities. AFI 91-202, *The US Air Force Mishap Prevention Program*, “establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information.” To meet the goals of minimizing loss of USAF resources and protecting military personnel, mishap prevention programs address groups at increased risk for mishaps, injury, or illness; a process for tracking incidents; funding for safety programs; metrics for measuring performance; goals for safety; and methods to identify safety BMPs.

3.9.2 Environmental Consequences

Any increase in safety hazards would be considered an adverse impact on safety. A proposed action could have a significant impact with respect to health and safety if the following were to occur:

- Substantial increase in risks associated with the safety of construction and installation personnel, contractors, or the local community
- Hindrance in the ability to respond to an emergency
- Introduction of a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place

3.9.2.1 PROPOSED ACTIONS

The Proposed Actions would result in short- and long-term, negligible to minor, adverse and beneficial impacts on health and safety.

Short-term, negligible to minor, adverse impacts would occur during construction and demolition of the Proposed Actions. Construction activities pose an inherent risk of accidents to workers, but this level of risk would be managed by adhering to established federal, state, and USAF safety regulations and policies. Construction and demolition contractors would establish and maintain health and safety programs for their workers. Construction workers would be required to wear personal protective equipment such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Health and safety for non-construction-related personnel or dependents that might be in the area during construction would be maintained through administrative and engineering controls, such as construction barriers and warning posters and signs.

Long-term, negligible to minor, beneficial impacts on health and safety would result from the demolition of aging facilities that could contain asbestos-containing materials (ACM), lead-based paint (LBP), or polychlorinated biphenyls (PCB) and the construction of new facilities and infrastructure providing a safer environment for installation personnel. Improvements to existing parking lots (Projects K and S); construction of a bypass road directing traffic around the CATM Complex (Project J), connector roads (Project C), and a trail along Academy Drive and North Gate Boulevard (Project AG); and upgrades to existing water supply lines throughout Jacks Valley (Project AH) would provide a safer environment for installation personnel and cadets.

3.9.2.2 PROJECT D1 ALTERNATIVE

Impacts from the Project D1 Alternative would be the same as those described in **Section 3.9.2.1** for the Proposed Actions. Short-term, negligible to minor, adverse impacts would occur during construction of the Project D1 Alternative.

3.9.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on health and safety.

3.9.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, no new facilities would be constructed, and existing conditions for health and safety would remain unchanged.

3.10 Hazardous Materials and Wastes

3.10.1 Existing Conditions

3.10.1.1 HAZARDOUS MATERIALS, HAZARDOUS WASTES, AND PETROLEUM PRODUCTS

Typical hazardous materials used at USAFA include fuels, solvents, lubricants, and caustics. The use of these hazardous materials and petroleum, oils, and lubricants (POL) results in the generation and storage of hazardous wastes and used petroleum products on the installation.

The installation's Hazardous Materials Emergency Planning and Response Plan provides preventative actions designed to lower the potential for hazardous materials spills as well as notification procedures and responses to releases that might occur. Hazardous materials used on the installation are distributed through the Hazardous Materials Management System. The purpose of the Hazardous Materials Management System is to minimize the use of hazardous materials, thereby reducing the generation of hazardous wastes. Additionally, hazardous materials used on the installation are assessed to determine whether a less toxic alternative material could be used (USAFA 2018a).

As stated in **Section 1.3.4**, the MSA serves as a temporary hazardous materials storage area for materials in transit. Depending on the type and amount of materials stored, certain areas of Jacks Valley are off limits when the MSA is being used for hazardous materials storage (USAF 2020).

3.10.1.2 TOXIC SUBSTANCES

Under Project R (Construct ATV Storage Facility), Building 1068, a latrine constructed in 1967, would be demolished. Under Project T (Construct Consolidated BCT Facility), Buildings 1040 and 1070, latrines constructed in 1967 and 1968, respectively; Building 1075, a medical building constructed in 2010; and Building 1099, a shed, would be demolished. Based on the age of Buildings 1040, 1068, and 1070, they have the potential to contain toxic substances such as ACMs, LBP, and PCBs.

3.10.1.3 ENVIRONMENTAL CONTAMINATION

There are three active Environmental Restoration Program (ERP) sites at USAFA, but none of them occur within or adjacent to the Proposed Action areas (USAFA 2018a). No active Military Munitions Response Program sites occur at USAFA.

3.10.1.4 RADON

USEPA rates El Paso County, where the Jacks Valley portion of USAFA is located, as radon zone 1. Counties in zone 1 have predicted average indoor radon screening levels greater than 4 picocuries per liter (pCi/L); therefore, indoor radon levels in buildings in the Proposed Action areas may exceed the USEPA standard of concern for indoor radon of 4 pCi/L (USEPA 2020b). In the Jacks Valley portion of USAFA, Buildings 1021 and 1085 were previously evaluated for radon. The indoor radon levels were 1.2 pCi/L for Building 1021 and 1.0 pCi/L for Building 1085. Because of the limited amount of time that the remaining buildings are occupied, no other buildings in the Jacks Valley portion of USAFA have been evaluated (Klein 2021).

3.10.2 Environmental Consequences

Impacts on or from hazardous materials and wastes would be considered significant if a proposed action would result in noncompliance with applicable federal or state regulations or would increase the amounts generated or procured beyond current management procedures, permits, and capacities. Impacts on contaminated sites would be considered significant if a proposed action would disturb or create contaminated sites resulting in negative impacts on human health or the environment, or if a proposed action would make it substantially more difficult or costly to remediate existing contaminated sites.

3.10.2.1 PROPOSED ACTIONS

The Proposed Actions would result in short- and long-term, negligible to minor, adverse and beneficial impacts on hazardous materials and hazardous waste management.

Hazardous Materials, Hazardous Wastes, and Petroleum Products

Short-term, negligible to minor, adverse impacts on hazardous materials and petroleum products would result from demolition and construction should any hazardous material or petroleum product be released into the environment. Hazardous materials that could be used include concrete, asphalt, paints, solvents, preservatives, and sealants. Construction equipment would use small quantities of hazardous materials and POLs such as solvents, hydraulic fluid, oil, and antifreeze. Hazardous materials could also be used for minor equipment servicing and repair activities. Under the Proposed Actions, construction contractors would ensure that the handling and storage of hazardous materials and POLs is carried out in compliance with applicable federal, state, and local laws and regulations. Demolition and construction would adhere to applicable management plans such as the installation's Hazardous Materials Emergency Planning and Response Plan. The severity of a potential impact from an accidental release would vary based on the extent of the release and the substance(s) involved.

No existing storage tanks, hazardous materials, or POL storage areas would be affected under the Proposed Actions. Although construction activities may require the temporary use of aboveground storage tanks onsite for power generation or equipment fuel, their use and maintenance would comply with applicable federal, state, and local laws and regulations to include secondary containment. Aboveground storage tanks would be used temporarily and would be removed from the area upon project completion.

All hazardous materials, hazardous wastes, and petroleum products used or generated during construction would be contained, stored, and managed appropriately (e.g., secondary containment, inspections, spill kits) in accordance with applicable regulations to minimize the potential for releases. All construction equipment would be maintained according to manufacturer's specifications, and drip mats would be placed under parked equipment as needed.

Demolition activities would generate negligible quantities of hazardous wastes. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and state laws.

Toxic Substances

Short-term, negligible, adverse impacts from toxic substances would occur from demolition of buildings that could contain ACMs, LBP, and PCBs under the Proposed Actions. Surveys and appropriate abatement for these substances would be completed, as necessary, by a certified contractor prior to demolition activities to ensure that appropriate measures are taken to reduce potential exposure to, and release of, these substances. Contractors would wear appropriate personal protective equipment and would be required to adhere to all federal, state, and local regulations. All ACM- and LBP-contaminated debris would be disposed of at a USEPA-approved landfill.

Long-term, negligible to minor, beneficial impacts would occur from demolition of buildings that could contain ACMs, LBP, and PCBs under the Proposed Actions. Removing these buildings would reduce the potential for future human exposure to toxic substances, and would reduce the amount of ACMs, LBP, and PCBs to maintain at USAFA.

Environmental Contamination

No short- or long-term impacts associated with environmental contamination sites are expected. As stated in **Section 3.10.1**, none of the installation's active ERP sites occur in or adjacent to the activity areas; therefore, they do not represent impediments to the Proposed Actions.

Contractors performing demolition and construction could encounter undocumented soil or groundwater contamination during ground-disturbing activities. If soil or groundwater that is believed to be contaminated were discovered, the contractor would be required to immediately stop work, report the discovery to the installation, and implement appropriate safety measures. Ground-disturbing activities would not continue in the area until the issue was investigated and resolved.

Radon

Long-term, negligible, adverse impacts on radon levels could occur from the Proposed Actions. Because USAFA is in El Paso County, which has a rating of radon zone 1, any new facilities at the installation could have indoor radon screening levels greater than 4 pCi/L. Although basements and poorly ventilated areas are most commonly affected by radon, any indoor space in contact with the ground is at risk. Radon would be managed by including passive radon-reducing features such as installing ventilation systems, using tight seals around pipes and wires, and placing aggregate material between structures and the ground to encourage lateral flow of soil gas, where applicable.

3.10.2.2 PROJECT D1 ALTERNATIVE

Impacts from the Project D1 Alternative would be the same as those described in **Section 3.10.2.1** for the Proposed Actions. Short-term, negligible to minor, adverse impacts on hazardous materials and petroleum products would result from construction should any hazardous material or petroleum product be released into the environment. Under the Project D1 Alternative, construction contractors would ensure that the handling and storage of hazardous materials and POLs is carried out in compliance with applicable federal, state, and local laws and regulations.

3.10.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on hazardous materials and wastes.

3.10.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, and no new facilities would be constructed. Additional quantities of hazardous materials, hazardous wastes, and petroleum products associated with demolition and construction would not be used, stored, or generated, and the management of hazardous materials, hazardous wastes, petroleum products would remain unchanged. Toxic substances in the buildings proposed for demolition would remain and would continue to require maintenance by USAF personnel.

3.11 Infrastructure

3.11.1 Existing Conditions

3.11.1.1 UTILITIES

Electrical System

Electrical power for USAFA is purchased from Colorado Springs Utilities (CSU) and is delivered to the installation from two outside sources. Peak electrical loads are typically about 12 megawatts for the entire installation. The installation is served by two substations, each with a capacity of more than 20 megawatts, providing both redundancy and excess capacity to support future growth. Flexibility in the distribution system is provided by multiple 200-ampere (12-kilovolt) feeders, as well as a 600-ampere (12-kilovolt) loop. Within the installation boundary, a 40 ac, 6-megawatt solar array has been operating since 2010 and is capable of providing 50 percent of USAFA's peak load. Currently, approximately 12 percent of the installation's annual electric power is provided by the array (USAFA 2018a).

Electricity is supplied to the BCT, CATM, FERL, and ammunition storage areas in Jacks Valley by a 12.5-kilovolt underground primary line that follows Jacks Valley Road to Parade Loop North. A separate underground electrical line branches off of the underground line on Academy Drive to supply power to the POW camp. Across Jacks Valley, 35 transformers step down power from the main line to below 600 volts. Secondary underground lines supply this power to the individual facilities (USAF 2020).

Water Supply

Potable water to Colorado Springs, including USAFA and Jacks Valley, is supplied by CSU from the Pine Valley Treatment Plant and the J.A. McCullough Treatment Plant. Surface water is collected in the CSU water system from three river basins and is stored in 25 different reservoirs. Most of the water comes from the Rampart Reservoir, which currently supplies more than 70 percent of the Colorado Springs water demand. The current CSU water system supplies an annual average of 75,000 ac-ft of potable water, of which USAFA uses approximately 1,300 ac-ft. CSU water storage fluctuates with climatic conditions but has averaged 2.1 years of water storage over the last 5 decades. USAFA currently averages approximately 1 million gallons per day (gpd) in demand, which includes some potable irrigation. Without irrigation, USAFA potable water demand is estimated at 520,000 gpd. USAFA currently stores 2.6 million gallons in three tanks, allowing for up to 5 days of supply without irrigating. CSU can supply USAFA with nearly 6 million gpd, which is approximately six times average demand (USAFA 2018a).

Potable water is supplied to Jacks Valley via a water main connected to the lines on Academy Drive and North Gate Boulevard. The main on the west side of the district is a 12-inch plastic pipe. A 6-inch plastic pipe extends from this main to serve the POW camp. The main line continues north and splits in the southern portion of the CATM area, with a 12-inch plastic pipe extending to the CATM facilities and another 12-inch plastic pipe continuing along FERL Road. The FERL area receives water through an 8-inch plastic pipe. The water main continues along FERL Road to reach the BCT training area. Here, the water line is looped through 8-inch plastic piping. South of the BCT training area, the water main is a 12-inch plastic pipe, but it changes to an 8-inch metal pipe along Jacks Valley Road, closer to its connection with the line on North Gate Boulevard (USAF 2020).

Wastewater System

The installation's wastewater treatment plant (WWTP), located in the southeastern portion of USAFA, processes the sanitary sewage generated on the installation, sending gray water into the installation's non-potable irrigation system for use on the athletic fields, cemetery, golf courses, and medians. The WWTP has a design capacity of 1,400,000 gpd. Data from Fiscal Year 2016 indicated average daily process flows of 684,000 gpd, with the high month in November (933,000 gpd) and the low month in July (527,000 gpd). The on-installation irrigation system receives an average of about 500,000 gpd from the WWTP. The wastewater collection system consists of a network of approximately 385,600 linear ft (73 miles) of collection mains and 25 oil/water separators and is adequately sized to serve the current demand (USAFA 2018a).

Wastewater is transported from Jacks Valley via a 10-inch, lined gravity main that begins in the CATM training area and follows FERL Road to the BCT training area and Jacks Valley Road before connecting to another sanitary sewer main on North Gate Boulevard. This main runs parallel to the rail tracks as it travels to the WWTP in the southeastern portion of the installation. In addition to the gravity main draining to the WWTP at the CATM training area, there is an isolated sewage disposal system for the area. The POW camp also has an isolated sewage disposal system (USAF 2020).

Stormwater System

Stormwater runoff on the installation collects in the non-potable reservoir system, is defused by infiltration, or flows into streams leading off the installation. There are approximately 367,000 linear ft of storm drainage pipe and five stormwater ponds or dry basins of varying size on the installation (USAFA 2018a).

Jacks Valley has large areas of natural landscape and a passive stormwater system comprised of barrow ditches along the road edges and small detention features that convey flow to ephemeral stream channels. A series of culverts and gravity lines also accommodate road access over natural drainage channels. This infrastructure helps ensure that the roads that are frequently traveled by Jacks Valley users are not washed out during major storms. However, several road segments have no stormwater infrastructure and become impassable during or after storms. Many of these roads are unpaved; without proper drainage, ruts, potholes, sheet ice, and pools of standing water may appear. As development occurs in Jacks Valley, additional measures are required to properly direct stormwater away from pavement, road edges, and areas that are subject to erosion. The water features in the obstacle course and assault course west of the BCT training area also require appropriate drainage infrastructure because they are regularly emptied after the summer military training season (USAF 2020).

Natural Gas

USAFA receives natural gas from two points for redundancy, and both supply points tie to the same general utility gas system. The current USAFA system capacity provides up to 1,000 cubic ft of natural gas per hour. Stored fuel supplies can provide heat plant fuel for more than 30 days should the need arise (USAFA 2018a).

Natural gas in Jacks Valley is distributed by a main line that follows Jacks Valley Road to Parade Loop North. This line enters the district at its entry control points, connecting to the installation's distribution lines at North Gate Boulevard and Stadium Boulevard. A separate distribution line extends from the main on Academy Drive to the POW camp. The BCT, CATM, and FERL areas have smaller service lines to their facilities, along with a series of aboveground and underground propane storage tanks providing service to each facility. There is only one natural gas control valve in Jacks Valley, located on the distribution line in the CATM training area (USAF 2020).

Liquid Fuel

The total liquid fuel supply capacity for the installation is 786,650 gallons. On the installation, 10 underground fuel storage tanks and 34 aboveground fuel storage tanks larger than 500 gallons contain diesel, gasoline, aviation jet fuel, aviation gasoline, or oil. Sixteen of these tanks are registered through the State of Colorado. Approximately 23 of these underground and aboveground fuel storage tanks are in Jacks Valley (USAFA 2018a).

Communications

Communications lines enter Jacks Valley at the entry control points. Most of these lines are underground, except for a few aboveground lines in the CATM training area and along Jacks Valley Road close to the BCT training area. Several communications lines in the district are owned by T&R Communications or DB Communications. Wi-Fi access in Jacks Valley is variable, and connectivity is limited or non-existent in some areas (USAF 2020).

Solid Waste

All solid waste is currently transported off the installation. Measures have been taken to implement recycling programs to decrease the amount of waste ending up in the landfill. A recycling center has been created in the Community Center, and Hunt Companies, Inc. collects recycling in the housing districts on a weekly basis. The City of Colorado Springs has strict guidelines regarding recycling, however, and much of the material collected for recycling is rejected. According to installation personnel, the primary reason for rejection is that recycling is provided in plastic bags (USAFA 2018a).

3.11.1.2 TRANSPORTATION

Gate Access

The installation is accessible to restricted personnel via the South Gate and to the civilian community via the North Gate between the hours of 7 a.m. and 5 p.m. every day and to proper ID holders from 5:30 a.m. to 10 p.m. The North Gate allows for relatively free roam from north of the Douglass Valley Housing area to south of Jacks Valley training area, excluding most buildings in the Cadet Area (USAFA 2018a). Jacks Valley is secured by an installation perimeter fence along its western, northern, and eastern borders. In addition, entry control points at two vehicle access roads, Jacks Valley Road and Parade Loop North, are passcode protected (USAF 2020). The gate system at USAFA is designed to provide flexibility depending on needs and has adequate capacity. To maintain security on the installation, temporary and permanent guard stations and unmanned gates throughout the installation keep unauthorized traffic away from restricted areas, such as the CATM range, Cadet Area, Airfield, and Jacks Valley (USAFA 2018a).

On-Installation Roadways

I-25 connects Colorado Springs to Denver and runs north-south through the eastern portion of the installation. Direct access to and from the installation is provided via I-25 interchanges with North Gate Boulevard and South Gate Boulevard. The North and South Gates are 5 miles apart, and North Gate Boulevard and South Gate Boulevard are the only roads accessing the installation. USAFA has the roadway infrastructure of a large city with a small-town population. Roadways vary from highways to unpaved roadways. The major arterial and collector roadways are asphalt paved with concrete curb or gravel shoulders. The arterial roadways include North Gate Boulevard, South Gate Boulevard, and Stadium Boulevard. The arterial roadways are in fair condition. Access to each district is available off these arterial roadways via collector roadways. Collector roadways include Academy Drive, Parade Loop, Pine Drive, and Community Center Drive. These collector drives are in adequate condition (USAFA 2018a).

Jacks Valley has a primary circuit of paved asphalt roadways, with all other roadways being compacted dirt or gravel. Jacks Valley has roads that access the CATM, BCT, Expeditionary Skills Training, and FERL areas. These roads are open to limited personnel due to the training and operations occurring in the area. Jacks Valley has the highest concentration of unpaved roadways on the installation. These roadways receive extensive maintenance every year prior to the start of BCT. USAFA grades unpaved roadways and patches paved roadways as required to bring them to good condition in preparation for BCT (USAFA 2018a).

Access from the main gates on Jacks Valley Road and Parade Loop North to the BCT, CATM, and FERL areas is facilitated by two-lane, paved asphalt roads. These roads create the primary circulation route within the district. The road leading to the POW camp is partially paved with asphalt, while certain sections remain graded gravel. The remaining roads in Jacks Valley are unpaved. These sections are used infrequently and are vulnerable to erosion and potholes. This necessitates regular maintenance and resurfacing. In months with inclement weather, these roads may be impassable without the use of an ATV. There is no direct connection in Jacks Valley between the Aardvark area and the primary circulation route. Access to this area from the west is restricted by Monument Creek and the Union Pacific rail tracks, which bisect the district. Currently, the only way to reach the Aardvark area is to turn onto an unpaved road from North Gate Boulevard, parallel to I-25. Another interruption to circulation in the district is the temporary closure of Jacks Valley Road south of the BCT area when operations at the ammunition storage area may impact the safety of those within a certain radius (USAF 2020).

Traffic using installation roads includes privately owned vehicles and school buses. Bus traffic congestion generated by the installation schools is common on roadways. During morning peak hours, traffic is an issue due to school traffic and commuters arriving to the installation.

Congestion is particularly high at the North and South Gates during morning peak hours. Traffic is classified as light during non-rush hours, with no issues reported (USAFA 2018a).

Off-Installation Roadways

Both installation entrances, North Gate Boulevard and South Gate Boulevard, intersect I-25 at interchanges, which provide direct access to and from the installation (USAFA 2018a).

Parking

Many vehicle parking areas are located throughout the installation, primarily for privately owned vehicles. Past studies show approximately 9,200 parking spaces, with approximately 6,800 spaces available during elevated threat levels. Parking is primarily on surface lots (USAFA 2018a). There is a parking deficit in the BCT and FERL training areas in Jacks Valley. The parking requirement for the BCT training area is approximately 135 parking spaces. These spaces are required for administrative staff, instructors, and medical staff who support training activities within the BCT training area. Currently, an unpaved parking lot in the BCT training area has 94 parking spaces. The requirement for the FERL training area has been identified as 60 parking spaces to support FERL staff and instructors. Currently, an unimproved area on the north side of the FERL training area is being used to park approximately 40 vehicles. The indoor firing range includes 40 parking spaces to address parking deficits at the CATM training area. Parking requirements for the POW camp area and Aardvark area are adequate (USAF 2020).

Pedestrian Facilities

USAFA has an extensive network of hiking trails both contained on the installation and leading into Pike National Forest. While these trails do not extend into the Jacks Valley district, the New Santa Fe Regional Trail borders the eastern portion of Jacks Valley. This trail travels along Monument Creek on the eastern edge of USAFA. It is a gravel-surfaced, 6-foot-wide, multi-use trail that is maintained by El Paso County (USAFA 2018a).

Public Transportation

USAFA does not have regular bus service throughout the installation but does operate a shuttle bus during special events (USAFA 2018a). Transportation for specific activities is scheduled through the 10th Logistics Readiness Squadron (USAF 2020).

Rail

A rail line owned by BNSF Railway runs through the eastern portion of the installation, including the Jacks Valley district, and is surrounded by right-of-way owned by Union Pacific. BNSF Railway and Union Pacific jointly operate the rail line. There are no security measures in place for the railroad easements (USAFA 2018a).

Airfield

Jacks Valley includes Aardvark Airfield in the eastern portion of the district, but the airfield is closed (USAFA 2018a). No other airfields exist in the Jacks Valley district. The primary USAFA Airfield is in the southeast corner of the installation. Because Aardvark Airfield is closed, airfield infrastructure is not discussed further in this section.

3.11.2 Environmental Consequences

Impacts on utilities are evaluated based on their potential to disrupt or improve existing infrastructure service levels and to create additional needs. An impact could be significant if a proposed action could do any of the following:

- Exceed capacity of a utility
- Create a long-term interruption in the operation of a utility

Impact analysis for transportation considers changes to roadway and intersection conditions, and travel patterns and accessibility (i.e., ease of drivers to reach a desired destination). An impact on transportation could be considered significant if a proposed action would result in any of the following:

- Substantial decline in roadway and traffic conditions
- Reduced traffic safety leading to increased risk of vehicular accidents
- Substantial and permanent changes to roadway accessibility

3.11.2.1 PROPOSED ACTIONS

Utilities

Electrical System. Short-term, negligible, adverse impacts from interruptions to electrical supply connections could be experienced when they are disconnected from buildings proposed for demolition (Projects R and T; see **Table 2-1**) and connected to new facilities. Work on the electrical system would be temporary and would be coordinated with area users prior to the start of work activities.

Long-term, minor, adverse impacts on the electrical supply would occur from an increase in energy consumption. The current electrical system has the capacity to support the additional demand generated by the Proposed Actions, specifically by new facilities proposed under Projects D, M, R, T, U, Z, and AA (see **Table 2-1**).

Water Supply. Short-term, negligible, adverse impacts from interruptions to water supply connections could be experienced when they are disconnected from buildings proposed for demolition (Projects R and T; see **Table 2-1**) and connected to new facilities. Work on the water supply system would be temporary and would be coordinated with area users prior to the start of work activities.

Long-term, minor, adverse impacts on the water supply would occur from an increase in potable water consumption associated with the demand generated by the Proposed Actions, specifically by new facilities proposed under Projects D, M, R, T, U, Z, and AA (see **Table 2-1**). The current potable water system has the capacity to support this additional demand. Long-term, minor, beneficial impacts on the water supply would result from Project AH (Loop the Jacks Valley District Water Supply Line), which would improve water supply access within the district.

Wastewater System. Short-term, negligible, adverse impacts from interruptions to the wastewater system connections could be experienced when they are disconnected from buildings proposed for demolition (Projects R and T; see **Table 2-1**) and connected to new facilities. Work on the wastewater system would be temporary and would be coordinated with area users prior to the start of work activities.

Long-term, minor, adverse impacts on the wastewater system would occur from an increase in wastewater production generated by the Proposed Actions, specifically by new facilities proposed under Projects D, M, R, T, U, Z, and AA (see **Table 2-1**). The current wastewater system has the capacity to support this additional demand.

Stormwater System. Short-term, negligible, adverse impacts would be expected due to the temporary disturbance of the stormwater systems during demolition and construction activities associated with the Proposed Actions. Implementation of BMPs and ESCPs for projects would minimize potential impacts of additional stormwater runoff and associated increases in erosion and sedimentation. Upon completion, cleared land would be revegetated with native species to the extent possible to reduce the potential for erosion and sedimentation.

Long-term, minor, adverse impacts on the stormwater system would be expected from a net increase of approximately 70,263 sq ft in impervious surface area due to the building footprints associated with the Proposed Actions, specifically Projects D, M, R, T, U, Z, and AA (see **Table 2-1**). The current stormwater system is already in poor condition and would not be able to support this increase in stormwater runoff without implementation of BMPs or drainage improvements. Impacts would be minimized through the use of federal design practices that require project sites to maintain or restore predevelopment site hydrology to the maximum extent technically feasible by using low impact development techniques that infiltrate, store, and evaporate runoff close to its source of origin.

Long-term, moderate, beneficial impacts on stormwater would be expected from the Proposed Actions. The 5 ac of drainage improvements in the BCT training area associated with Project X (Construct Drainage Improvements at the Assault Course and Obstacle Course) and the approximately 30 ac of district-wide improvements associated with Project AE (Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements) would result in overall better stormwater drainage and a subsequent reduction in flooding, erosion, and sedimentation.

Natural Gas. Short-term, negligible, adverse impacts from interruptions to the natural gas connections could be experienced when lines are disconnected from buildings proposed for demolition (Projects R and T; see **Table 2-1**) and connected to new facilities. Work on the natural gas system would be temporary and would be coordinated with area users prior to the start of work activities.

Long-term, minor, adverse impacts on the natural gas supply would occur from an increase in natural gas consumption generated by the Proposed Actions, specifically by new facilities proposed under Projects D, M, R, T, U, Z, and AA (see **Table 2-1**). The current system has the capacity to support this additional demand.

Liquid Fuel. Short-term, negligible, adverse impacts from fuel consumption for demolition and construction equipment would be expected. This increase in liquid fuel consumption would be temporary.

No long-term impacts on liquid fuel would be expected under the Proposed Actions.

Communications. Short-term, negligible, adverse impacts from interruptions to the communications systems could be experienced when they are disconnected from buildings proposed for demolition (Projects R and T; see **Table 2-1**) and connected to new facilities. Work on the communications systems would be temporary and would be coordinated with area users prior to the start of work activities.

Long-term, minor, adverse impacts on communications, particularly to Wi-Fi connectivity and speed, would occur from an increase in communications demand generated by the Proposed Actions, specifically by new facilities proposed under Projects D, M, R, T, U, Z, and AA (see **Table 2-1**). The additional demand on the installation's Wi-Fi may not be supported by the current system, causing delays or interruptions to Wi-Fi use; however, improvements are planned for the Wi-Fi system.

Solid Waste. Short-term, minor, adverse impacts on solid waste in the area would occur from an increase in solid waste generated by demolition and construction activities associated with the Proposed Actions. Contractors would be required to recycle demolition debris to the maximum extent practicable, thereby diverting it from landfills. The contractor would dispose of non-recyclable demolition debris at an offsite permitted landfill facility, which would have a long-term, negligible, adverse effect on solid waste management by permanently using landfill capacity.

Long-term, negligible, adverse impacts from an increase in solid waste generated by operation of the new facilities would be expected under the Proposed Actions. Off-installation landfills have the capacity to support this additional waste generation.

Transportation

Gate Access. Short-term, negligible, adverse impacts on the access gates would be expected during demolition and construction associated with the Proposed Actions as personnel and construction vehicles access the installation. It is expected that the North Gate has adequate policies, procedures, and capacity to efficiently route commercial/contractor vehicles through the inspection process.

No long-term impacts on the access gates would be expected to occur under the Proposed Actions.

On-Installation Roadways. Short-term, negligible, adverse impacts on on-installation roadways would be expected during demolition and construction associated with the Proposed Actions as personnel and construction vehicles access the installation. The associated increase in traffic would be temporary, and intermittent road closures would be communicated to installation staff via electronic signs, installation-wide bulletins, and electronic memos.

Long-term, minor, beneficial impacts on on-installation roadways would be expected from roadway construction and improvements associated with Projects C, J, L, O, and AG (see **Table 2-3**). Projects C and J would provide greater connectivity within Jacks Valley. In addition, Project J would alleviate through-traffic congestion in the CATM training area.

Roadway improvements and demolition associated with Projects L and O would improve traffic circulation by upgrading usable roads and removing redundant roads. Project AG would remove pedestrians and bicyclists from Academy Drive and North Gate Boulevard, providing adequate space for vehicles on these roadways.

Off-Installation Roadways. Short-term, negligible, adverse impacts on off-installation roadways would be expected during demolition and construction associated with the Proposed Actions as personnel and construction vehicles use I-25 to access the installation. The associated increase in traffic would be temporary, and I-25 has the capacity to handle the increase in vehicles.

No long-term impacts on off-installation roadways would be expected to occur under the Proposed Actions.

Parking. Short-term, minor, adverse impacts on installation parking would occur from an increased parking demand for construction vehicles associated with the Proposed Actions. This increase would be temporary, and construction staging areas would minimize effects on adjacent areas.

Long-term, minor, beneficial impacts on installation parking would be expected from construction of a new parking lot associated with Project K (Construct FERL Parking Lot) and improvements to the existing BCT training area parking lot associated with Project S (Improve the Existing BCT Parking Lot). The increased parking capacity would improve the current parking situation, which is inadequate for the installation.

Pedestrian Facilities. No short-term impacts on pedestrian facilities would be expected to occur under the Proposed Actions.

Long-term, minor, beneficial impacts would be expected a result of Project AG (Construct a Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard), which would construct a new unpaved trail for running, walking, and biking along Academy Drive and North Gate Boulevard.

Public Transportation. Because public transportation is not regularly available across the installation, no impacts on public transportation would be expected under the Proposed Actions.

Rail. Because the railroad would not be affected by any of the Proposed Actions, no impacts on rail would be expected.

3.11.2.2 PROJECT D1 ALTERNATIVE

Utilities

Impacts on utilities from the Project D1 Alternative would be similar to those described in **Section 3.11.2.1** for the Proposed Actions. Short-term, negligible, adverse impacts would be expected on the electrical system, water supply, wastewater system, stormwater system, natural gas, liquid fuel, and communications; short-term, minor, adverse impacts would be expected on solid waste in the area.

Long-term, negligible, adverse impacts would be expected on the electrical system, water supply, wastewater system, stormwater system, natural gas, communications, and solid waste. No long-term impacts would be expected on liquid fuel.

Transportation

Impacts on transportation from the Project D1 Alternative would be similar to those described in **Section 3.11.2.1** for the Proposed Actions. Short-term, negligible, adverse impacts would be expected on gate access, on-installation roadways, off-installation roadways, and parking. In addition, no short-term impacts would be expected on pedestrian facilities, public transportation, and rail. No long-term impacts on transportation would be expected.

3.11.2.3 REASONABLY FORESEEABLE ACTIONS

No other construction activities are proposed in Jacks Valley. No past, present, or reasonably foreseeable actions have been identified that, when combined with the Proposed Actions or the Project D1 Alternative, would be expected to result in significant impacts on utilities and transportation.

3.11.2.4 NO ACTION ALTERNATIVES

Under the No Action Alternatives, construction and demolition activities associated with the 19 Proposed Actions would not occur. Existing facilities would remain in use, and no new facilities would be constructed. Excess stormwater runoff, lack of roadway connectivity, deteriorating roadway conditions, and inadequate parking would continue to be a concern in Jacks Valley. Therefore, long-term, moderate, adverse impacts on utilities and transportation would be expected under the No Action Alternatives.

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4. References

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5. List of Preparers

This EA has been prepared by HDR, Inc. under the direction of the Air Force Civil Engineer Center, USAF, and USAFA. The following individuals from HDR, Inc. contributed to the preparation of this document:

Kelly Albery
B.S. Wildlife Conservation and Management
Years of Experience: 11

Isha Alexander
M.S. Biology
M.A. Organizational Psychology
B.A. Psychology
Years of Experience: 17

Michelle Bare
General Studies
Years of Experience: 32

Chad Blackwell
M.H.P. Historic Preservations
B.A. History
Years of Experience: 18

Tim Didlake
B.S. Earth Sciences
Years of Experience: 13

Jessica Forbes
M.A. History/Public History
B.A. History
Years of Experience: 10

Carolyn Hein
B.S. Environmental Sciences
Years of Experience: 2

Abbey Humphreys
M.S. Biology
B.S. Environmental Biology
B.S. Geospatial Science
Years of Experience: 4

Kathy Lemberg
B.A. Anthropology
Years of Experience: 15

Deborah Peer
M.S. Environmental Management
B.S. Zoology
B.S. Wildlife Science
Years of Experience: 19

Meghan Robinson
M.S. Environmental Policy and Management
B.S. Environmental Biology
Years of Experience: 11

Emily Smith
M.S. Natural Resources Law Studies
B.A. Biology
Years of Experience: 13

Patrick Solomon, CEP
M.S. Geography
B.A. Geography
Years of Experience: 27

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A

Public and Stakeholder Coordination List

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Appendix A: Public and Stakeholder Coordination List

Federal and State Agency Contacts

USDA Forest Service

U.S. Fish and Wildlife Service

Colorado Parks and Wildlife

Colorado State Historical Society, State Historic Preservation Office

Native American Tribes

Apache Tribe of Oklahoma

Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation

Cheyenne and Arapaho Tribes of Oklahoma

Cheyenne River Sioux Tribe

Comanche Nation of Oklahoma

Crow Nation

Eastern Shoshone Tribe of the Wind River Reservation

Flandreau Santee Sioux Tribe of South Dakota

Fort Belknap Indian Community

Fort Sill Apache Tribe

Jicarilla Apache Tribe

Kiowa Tribe of Oklahoma

Lower Brule Sioux Tribe of the Lower Brule Reservation

Mescalero Apache Tribe

Navajo Nation

Northern Arapaho Tribe

Northern Cheyenne Tribe

Oglala Sioux Tribe

Pawnee Nation of Oklahoma

Pueblo de Cochiti

Pueblo of Picuris

Pueblo of Santa Ana

Pueblo of Santa Clara

Pueblo of Taos

Pueblo of Zuni

Rosebud Sioux Tribe

Santee Sioux Nation

Southern Ute Indian Tribe

Spirit Lake Nation

Standing Rock Sioux Tribe

Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation

Ute Indian Tribe of the Uintah and Ouray Reservation

Ute Mountain Ute Tribe

Yankton Sioux Tribe

Libraries

U.S. Air Force Academy Library

Penrose Library (Colorado Springs)

Monument Library (Monument)

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B

Project Figures

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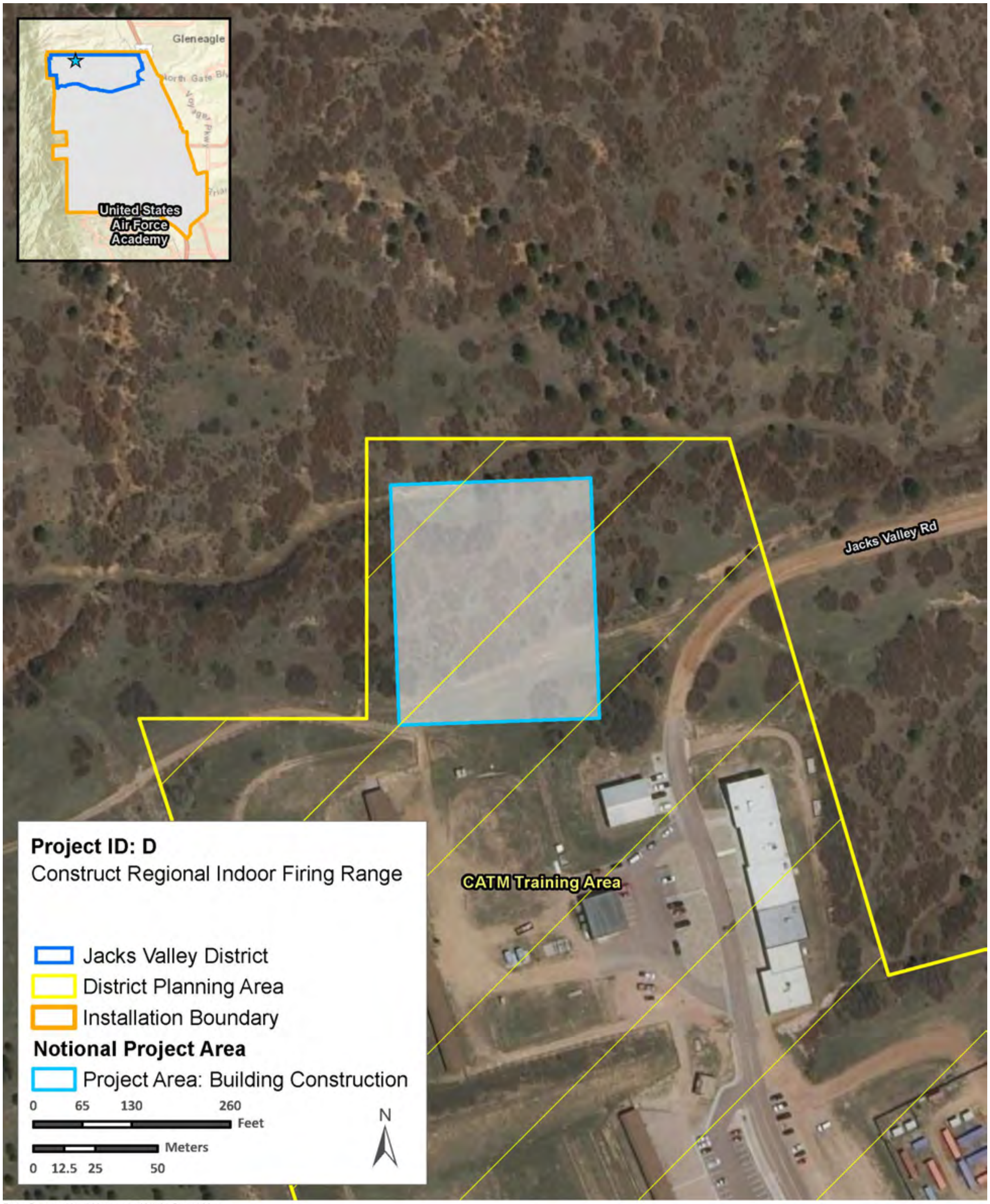

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Figure B-1. Facility Construction and Demolition: Project D

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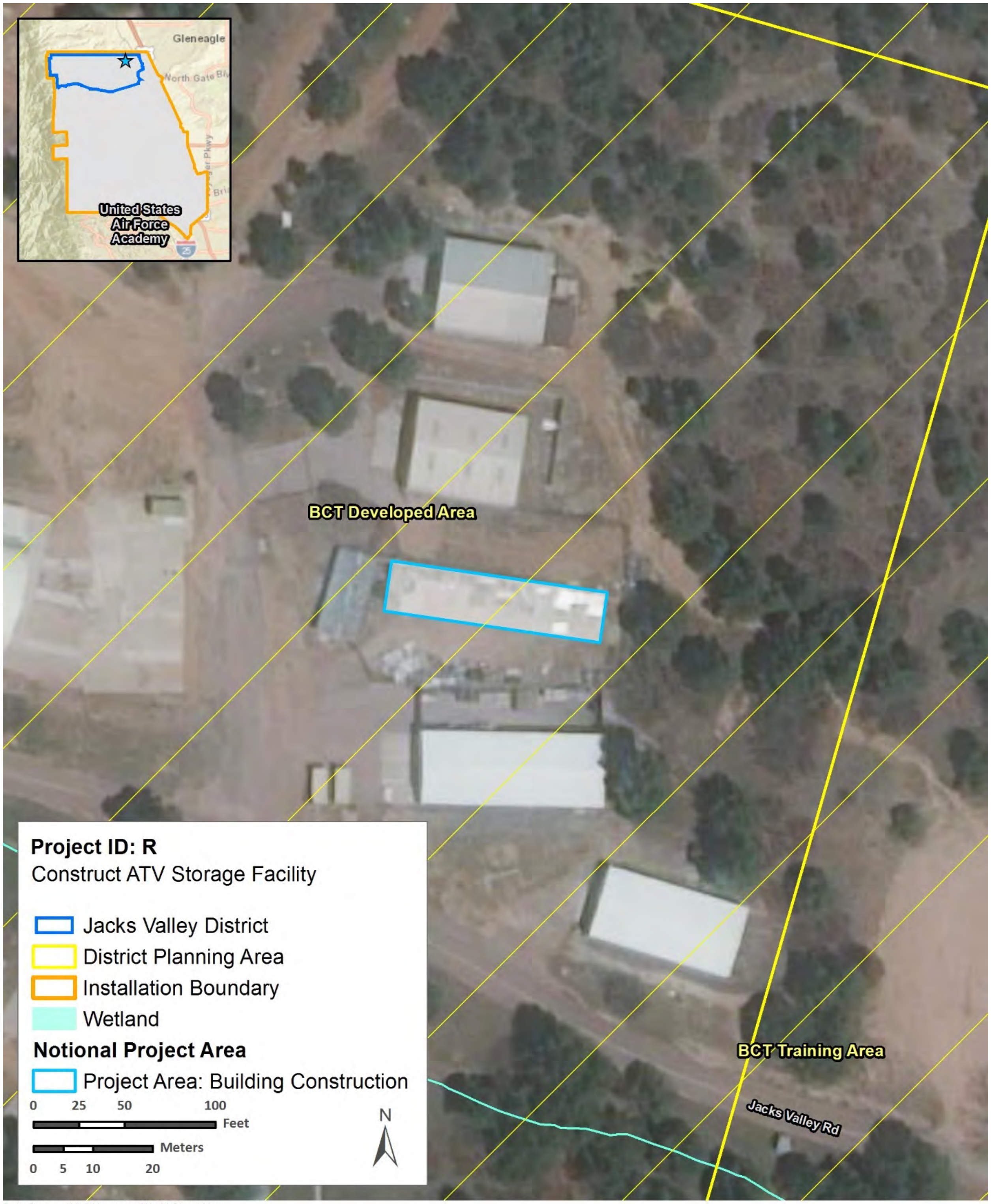
Figure B-2. Facility Construction and Demolition: Project D1 Alternative

Data Source: World Imagery; World Street Map

Figure B-3. Facility Construction and Demolition: Project M



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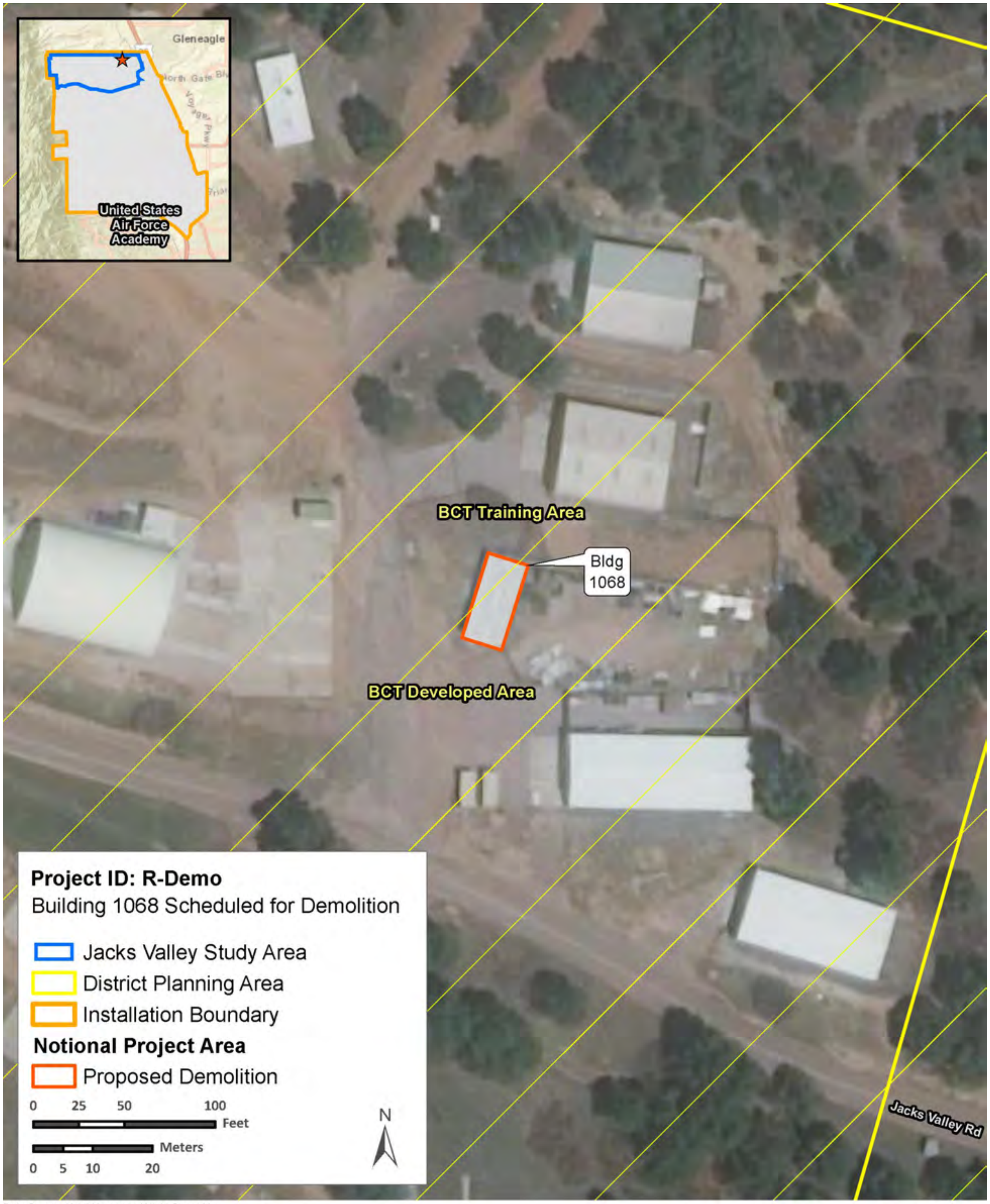

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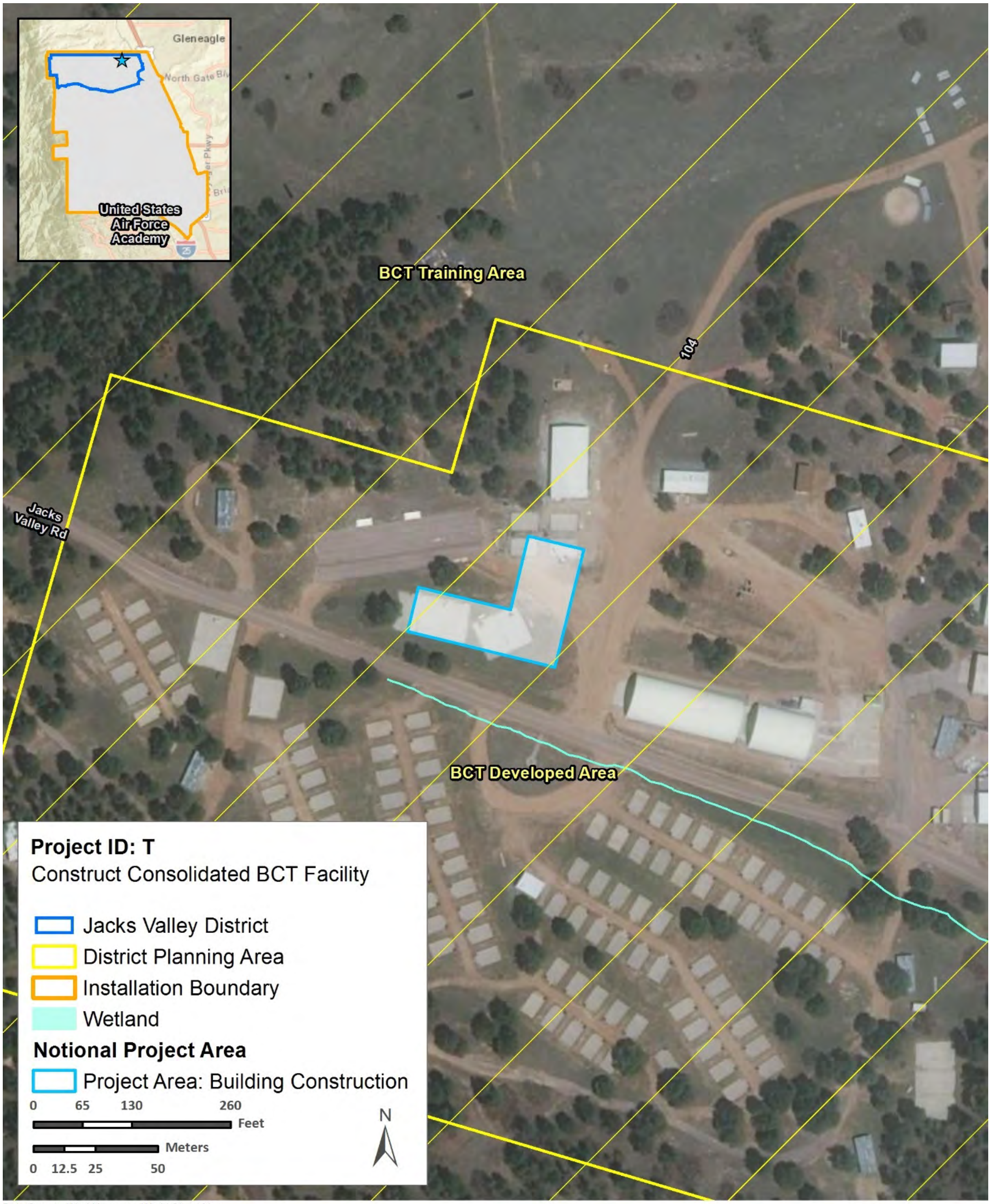

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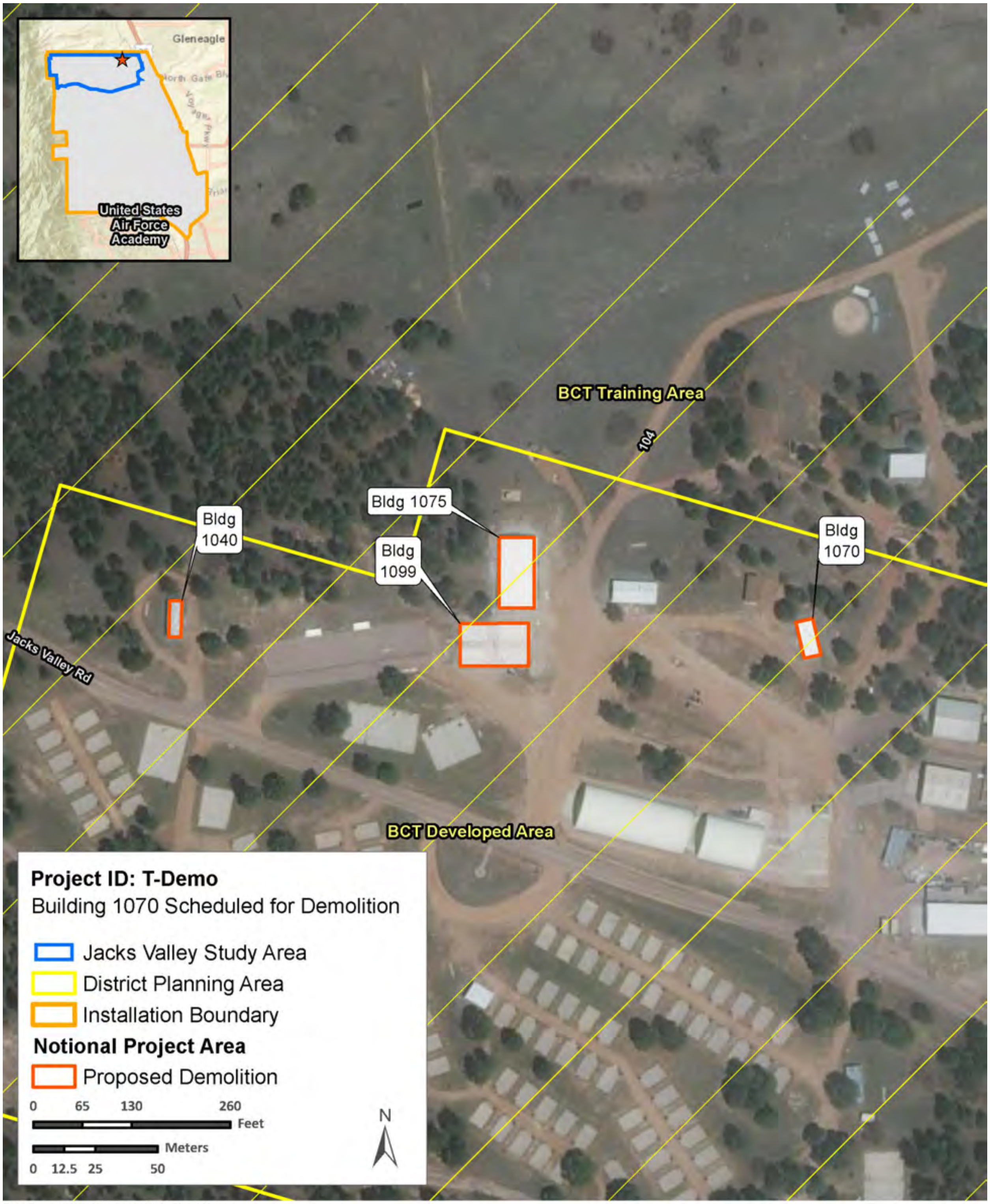

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Figure B-7. Facility Construction and Demolition: Project T

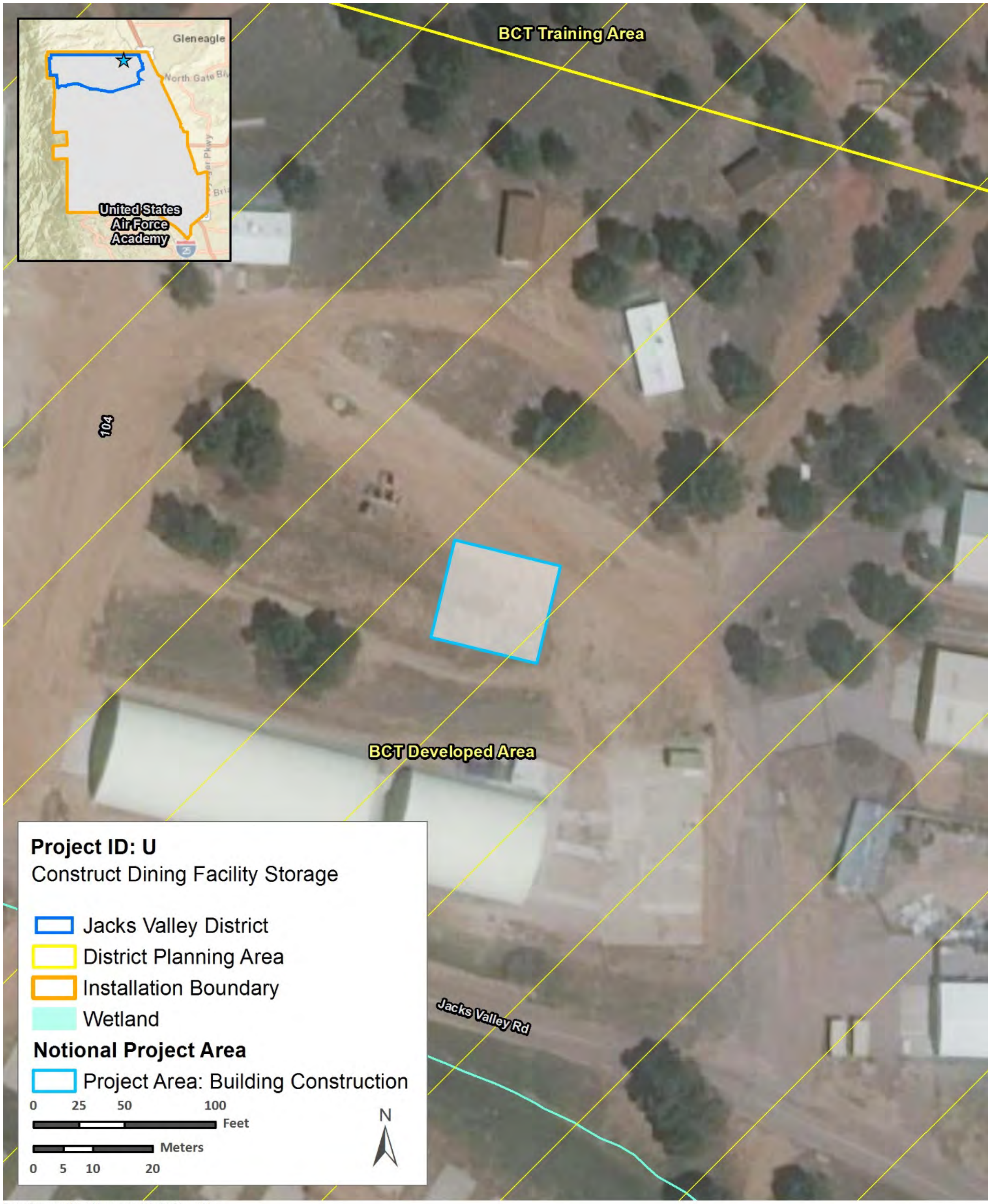

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Figure B-9. Facility Construction and Demolition: Project Z

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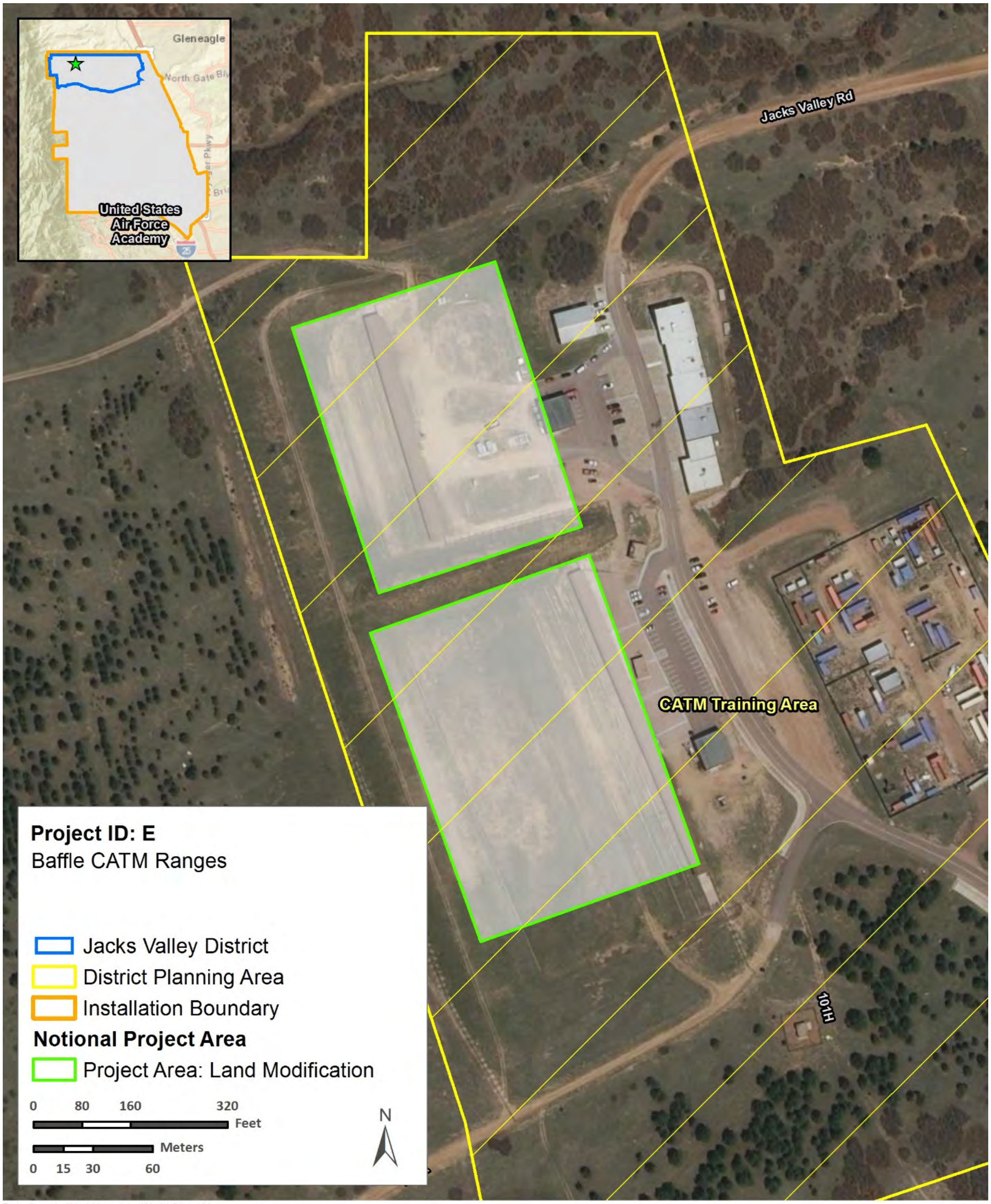
Figure B-10. Facility Construction and Demolition: Project Z

Data Source: World Imagery; World Street Map

Figure B-11. Facility Construction and Demolition: Project AA



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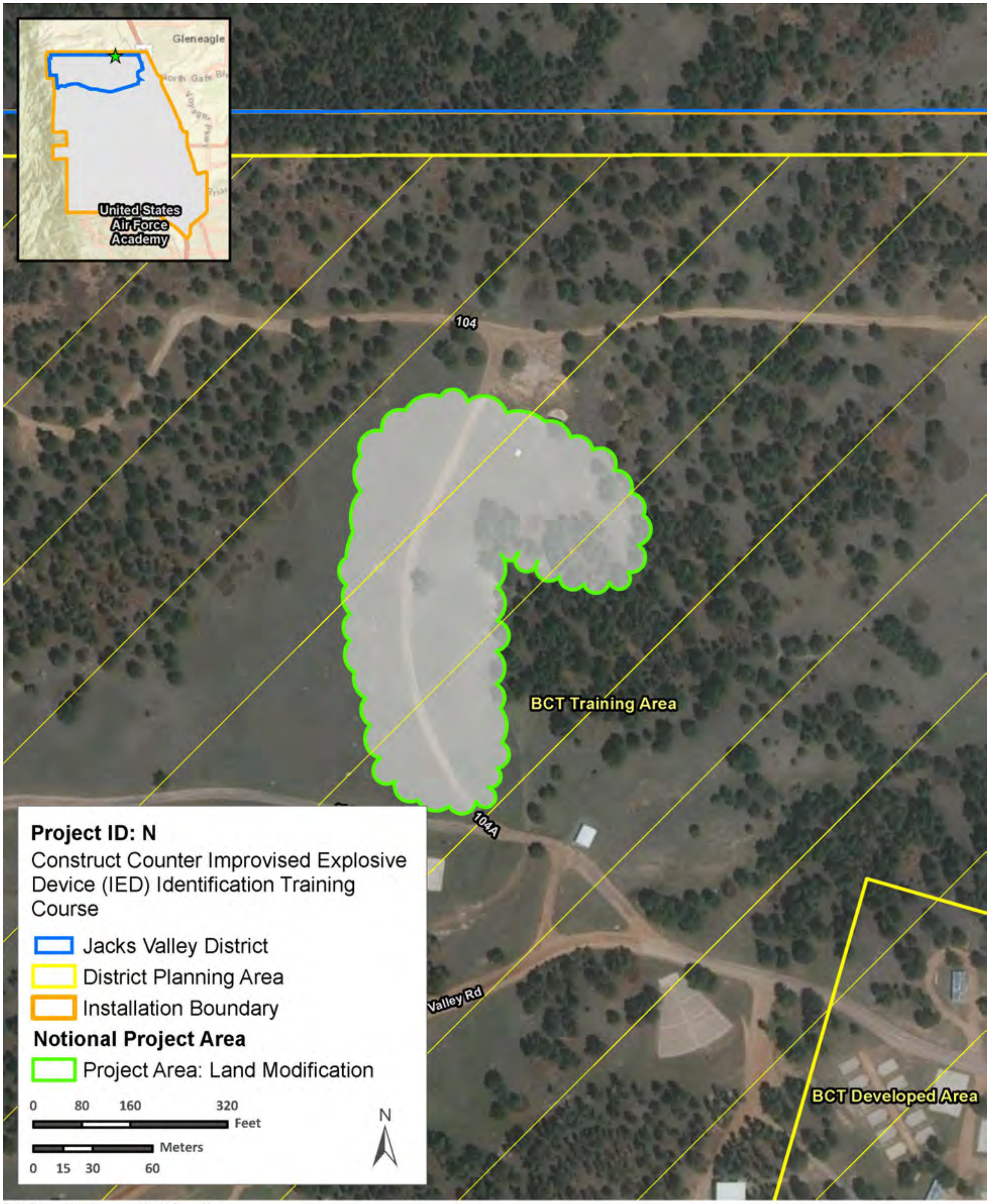

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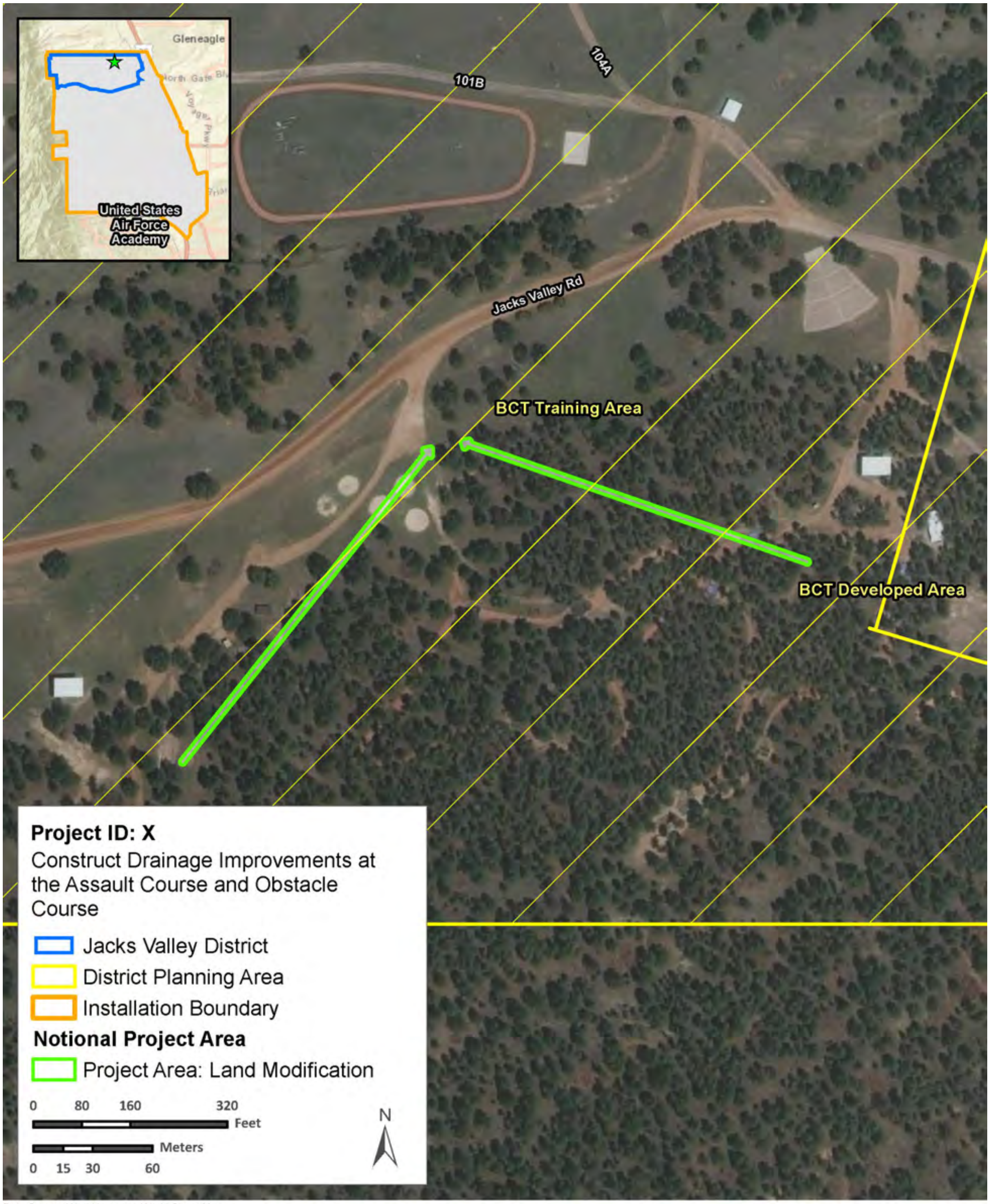

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Figure B-14. Land Modification: Project X

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Figure B-15. Roads and Trails Improvements: Project C (East)

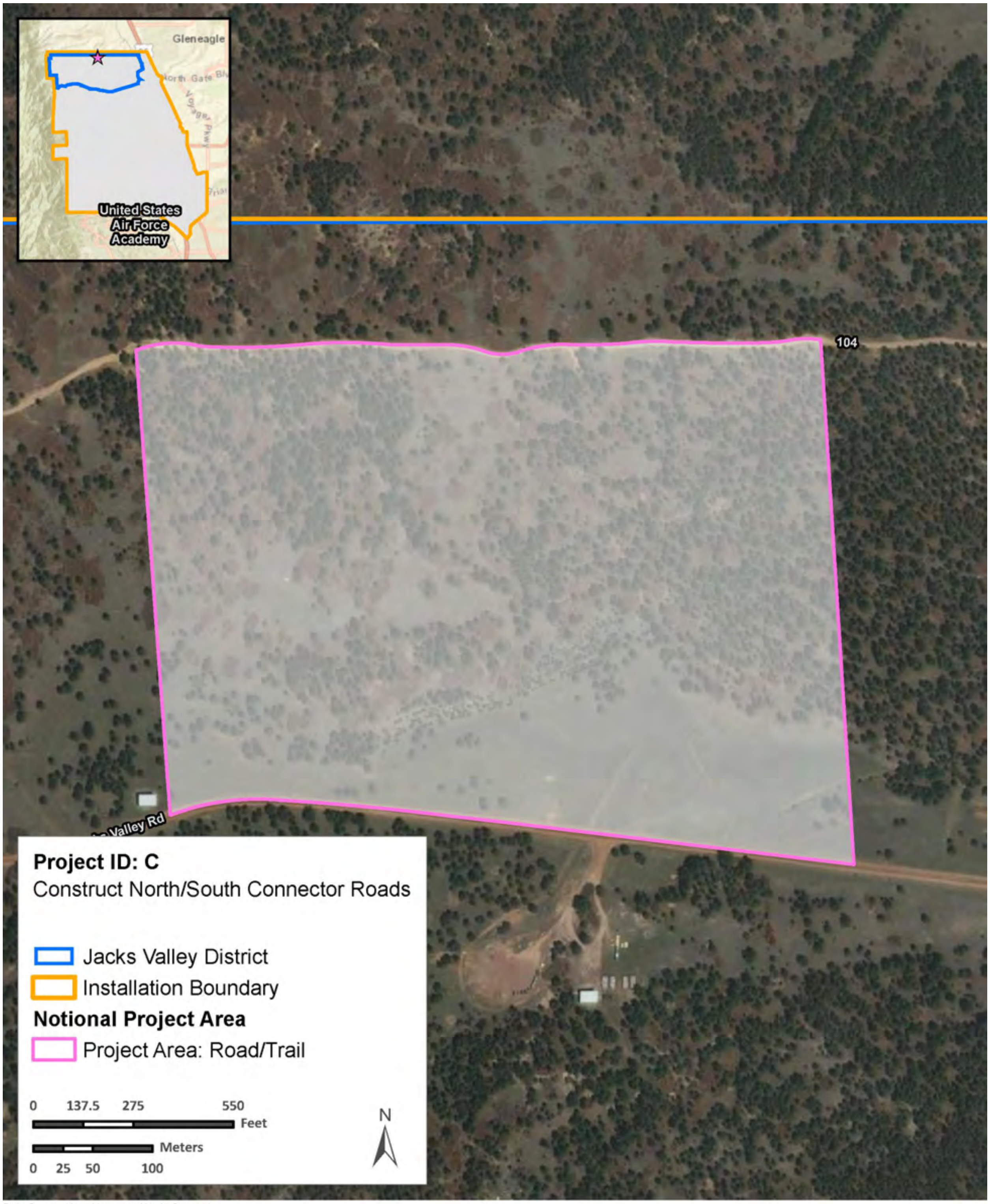

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Figure B-16. Roads and Trails Improvements: Project C (Central)

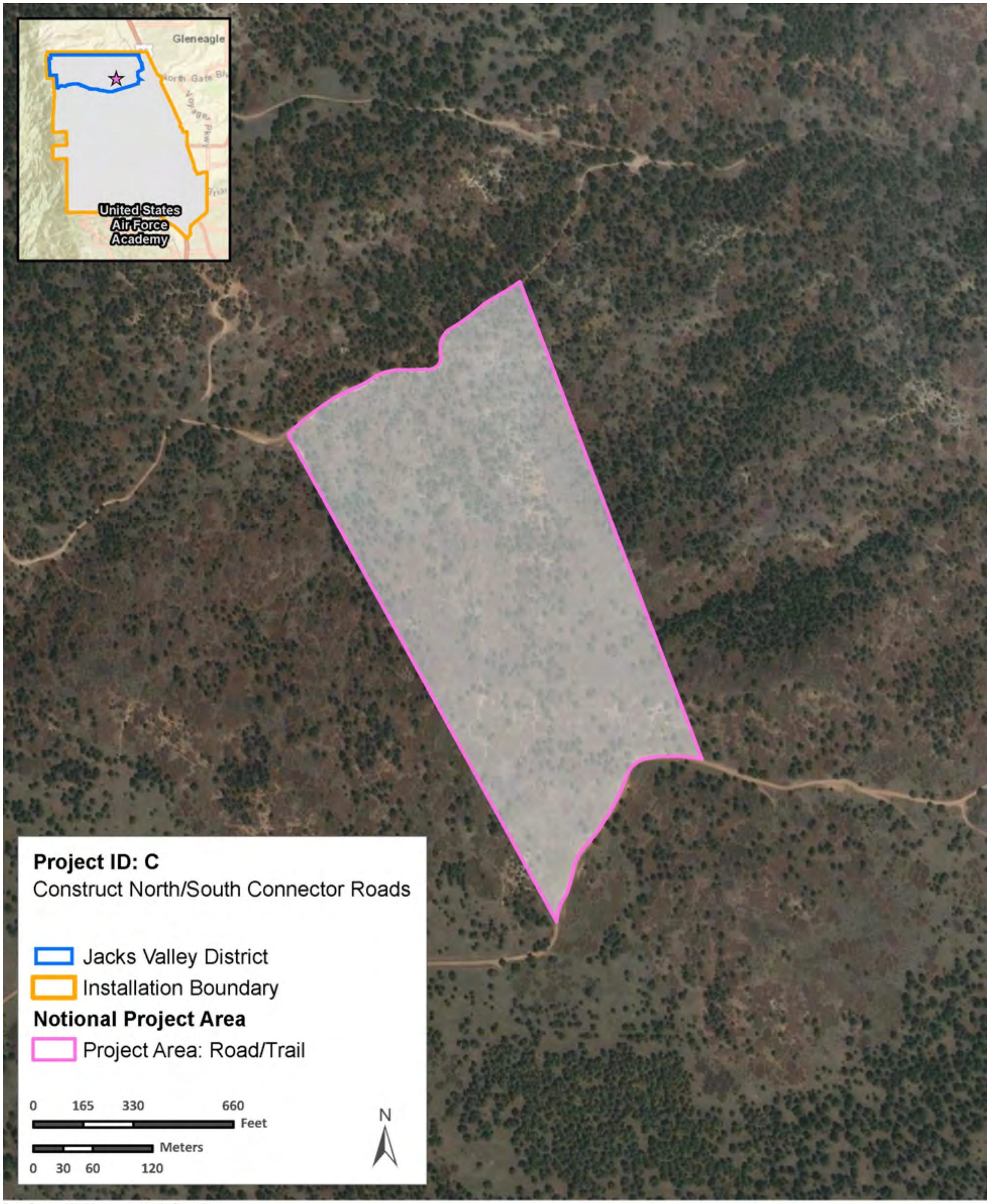

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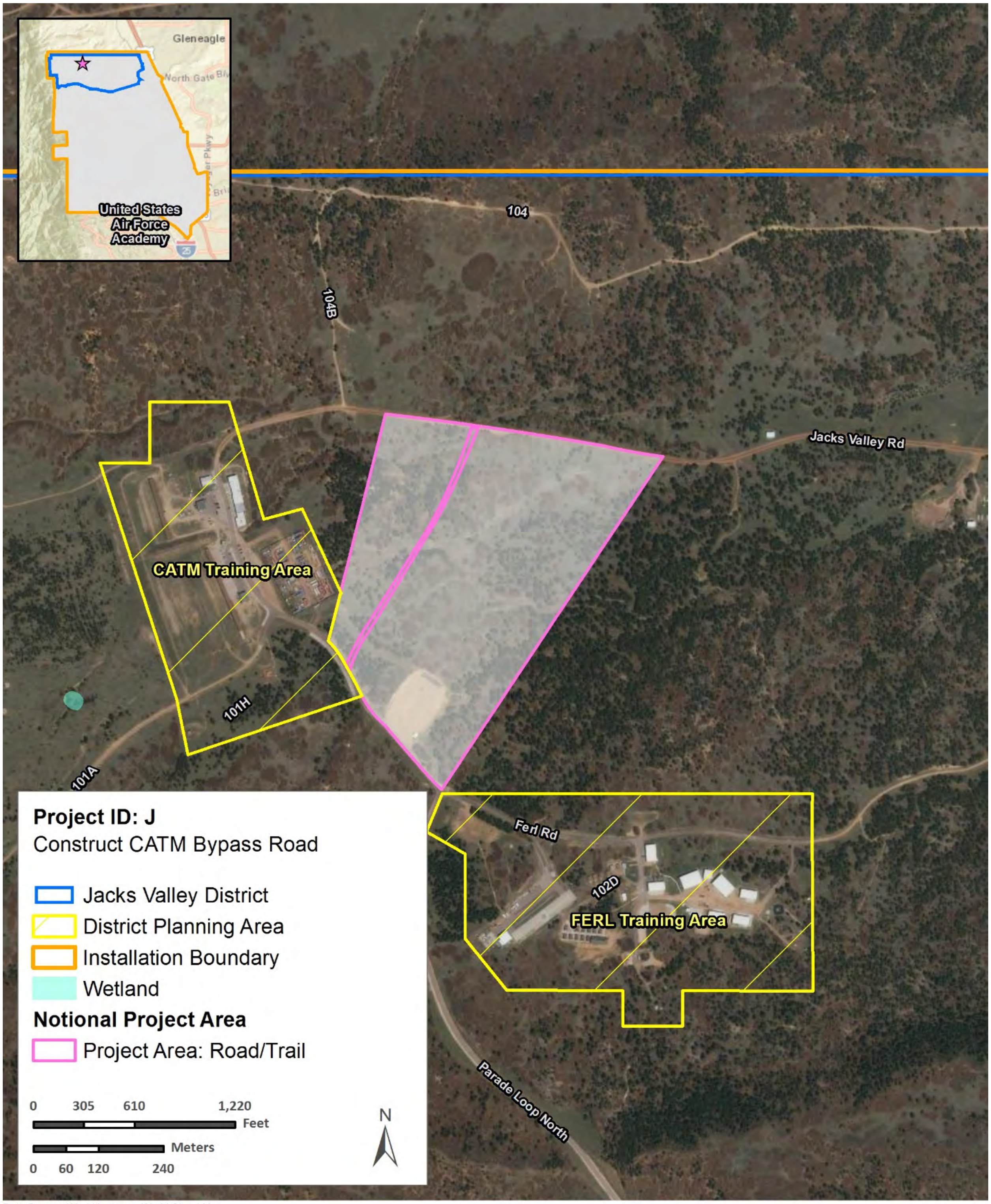
Figure B-17. Roads and Trails Improvements: Project C (Southeast)



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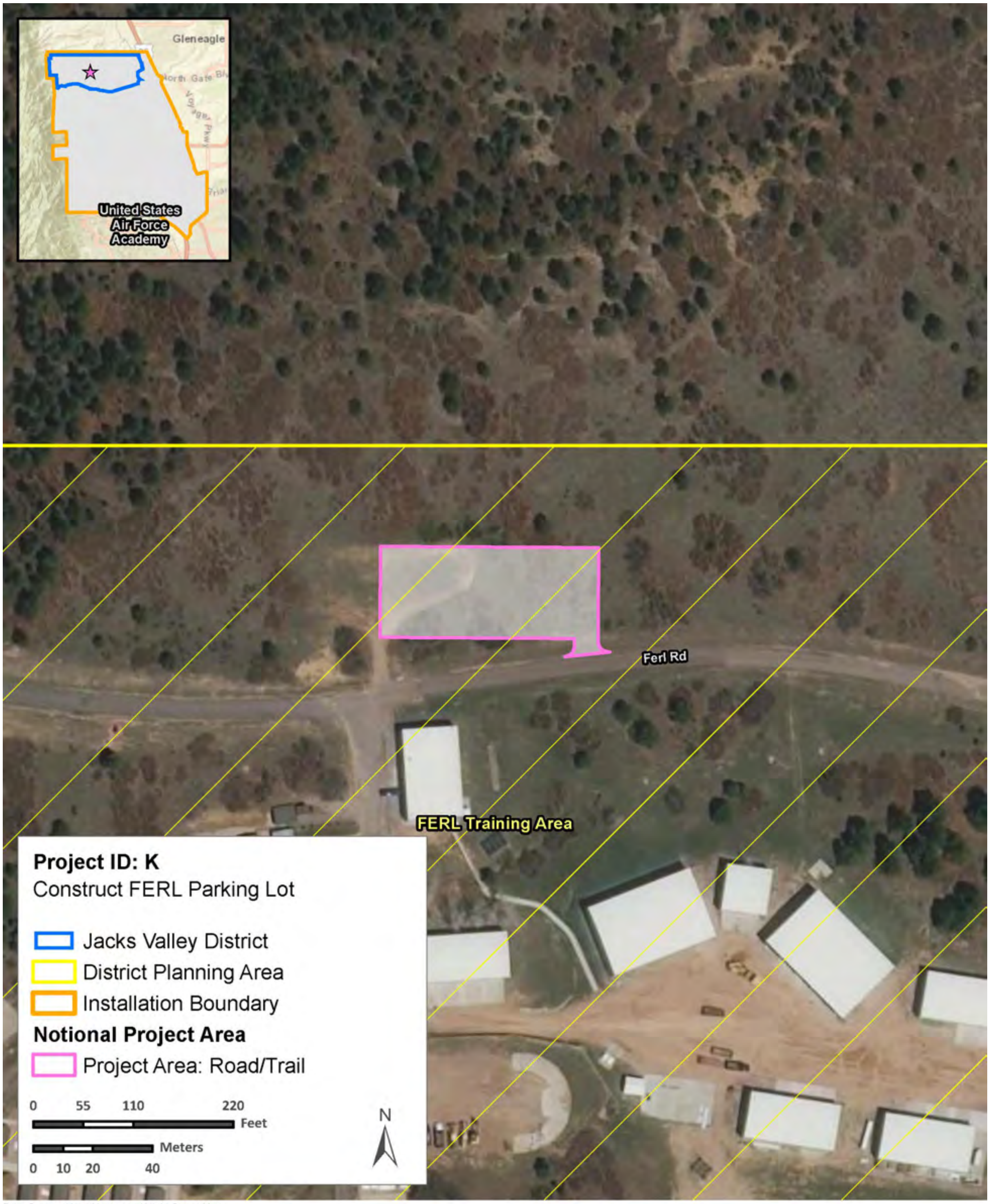

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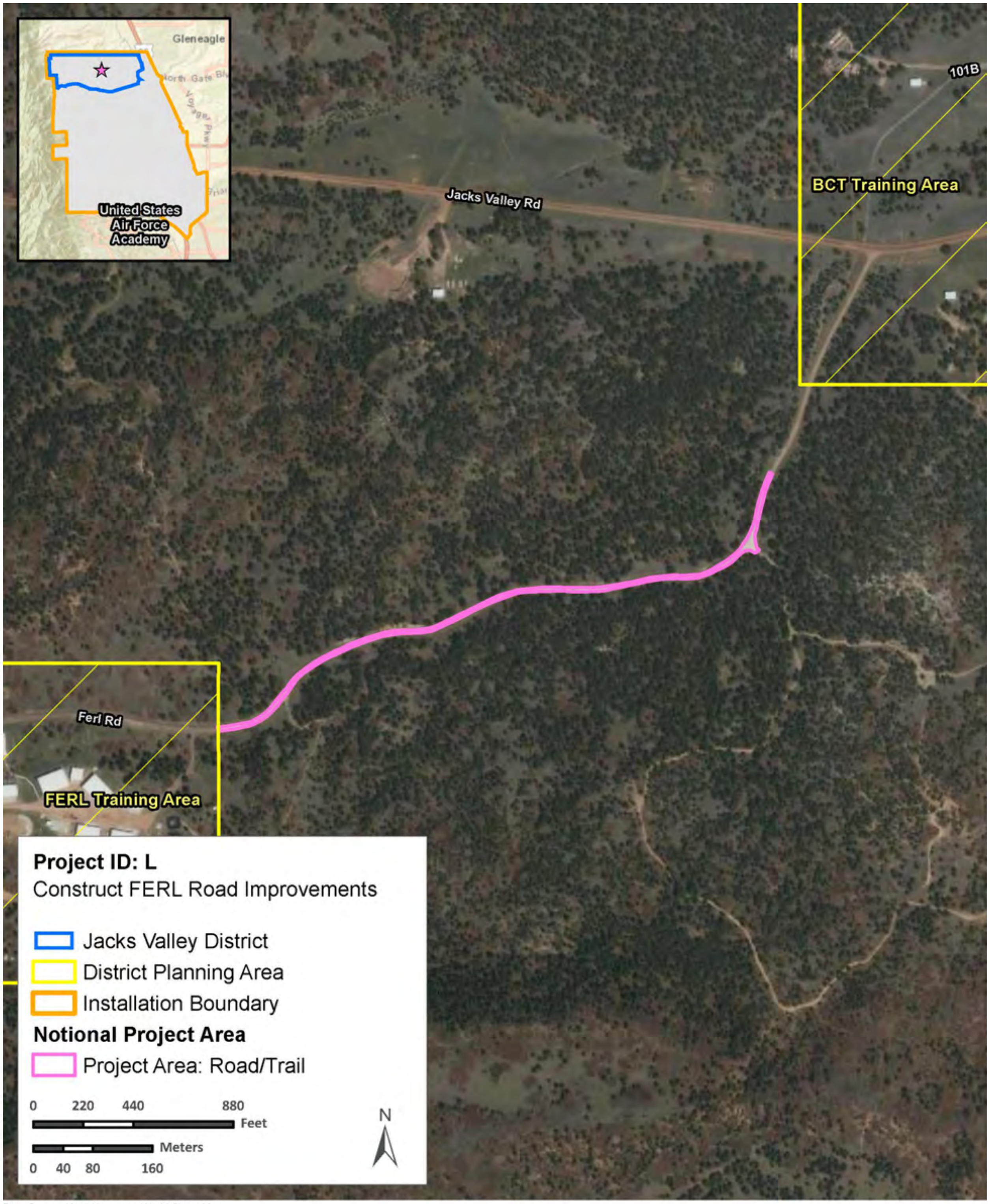
Figure B-19. Roads and Trails Improvements: Project K



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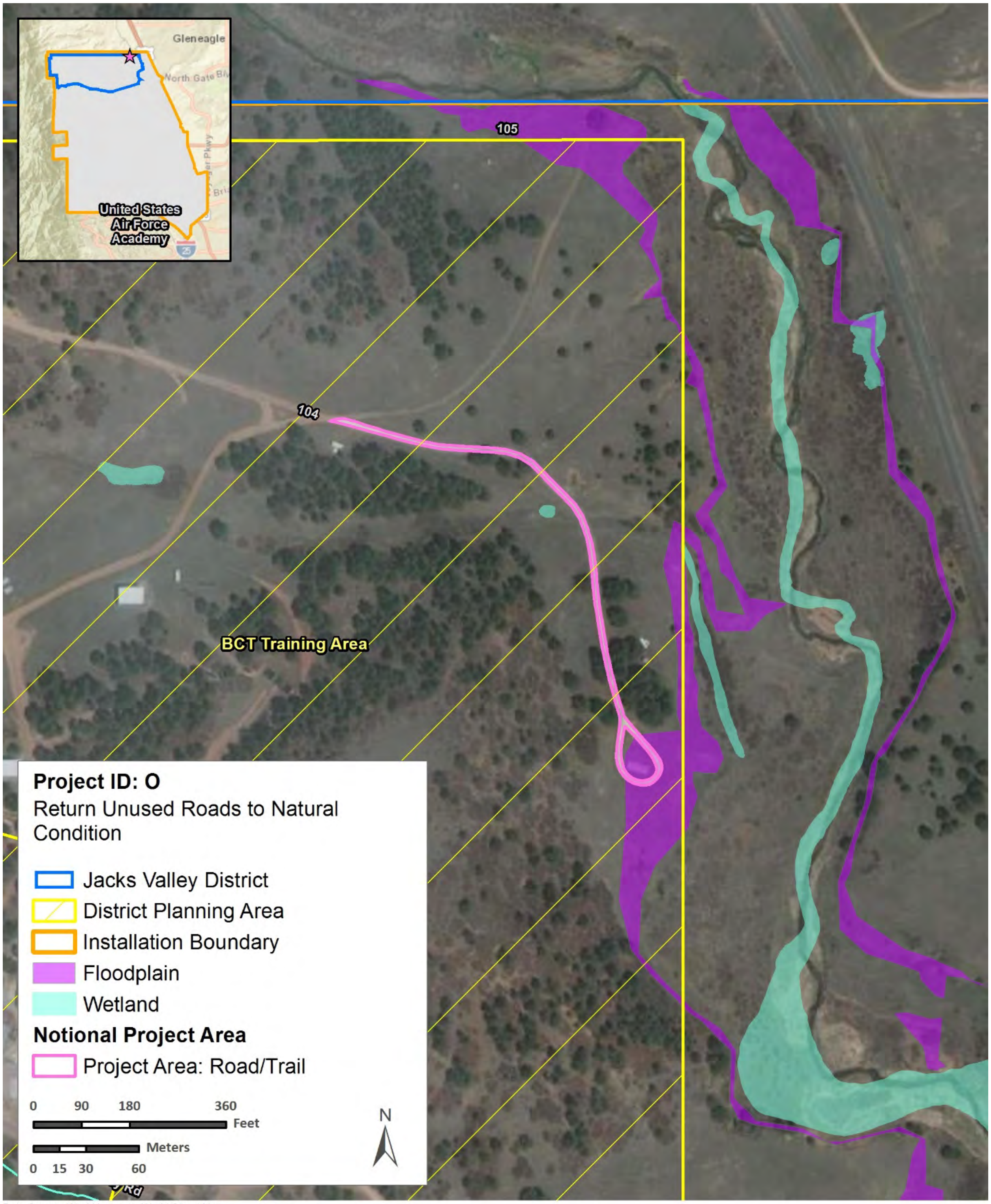

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Figure B-21. Roads and Trails Improvements: Project O

Data Source: World Imagery; World Street Map

Figure B-22. Roads and Trails Improvements: Project O

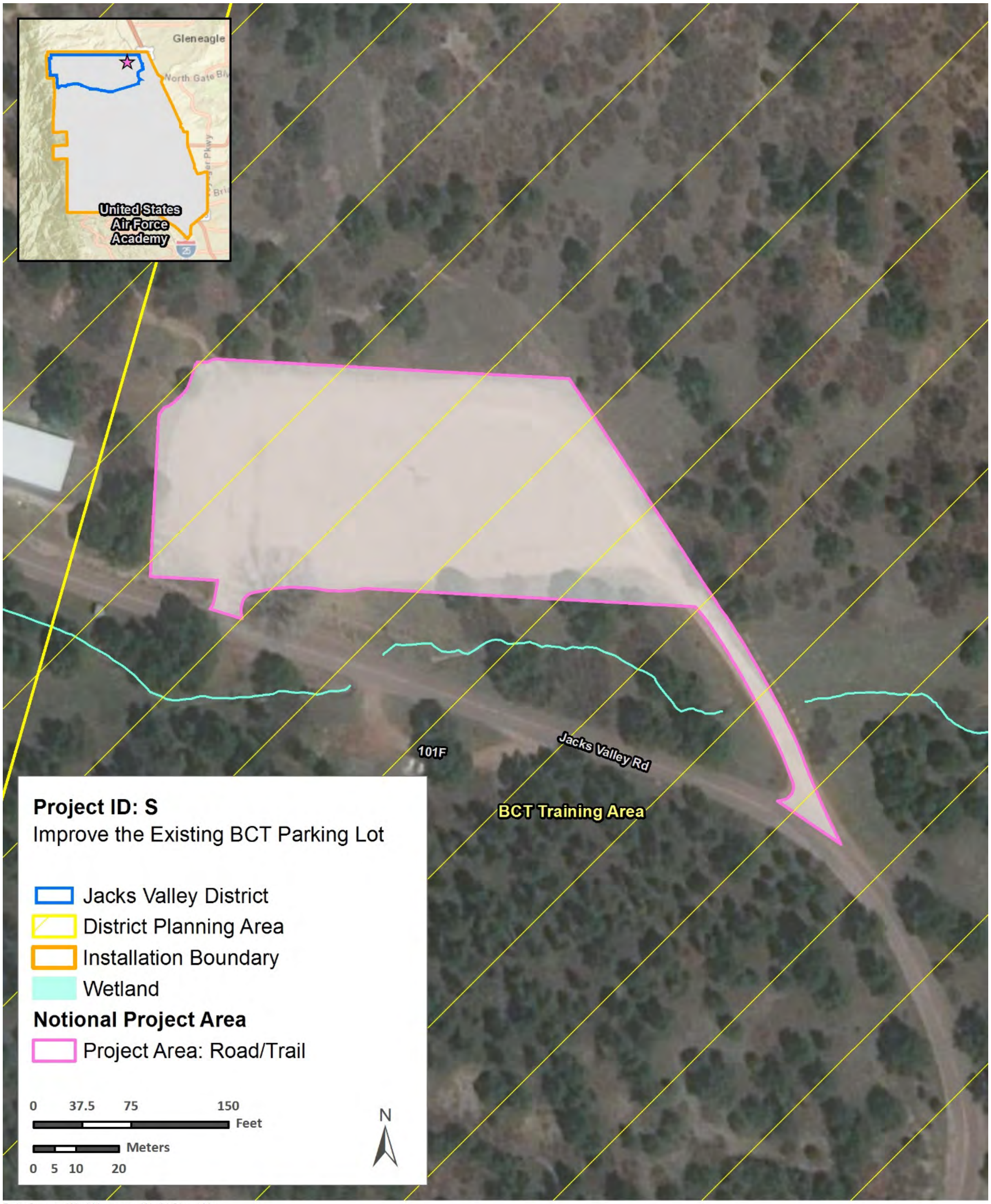

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Figure B-23. Roads and Trails Improvements: Project S

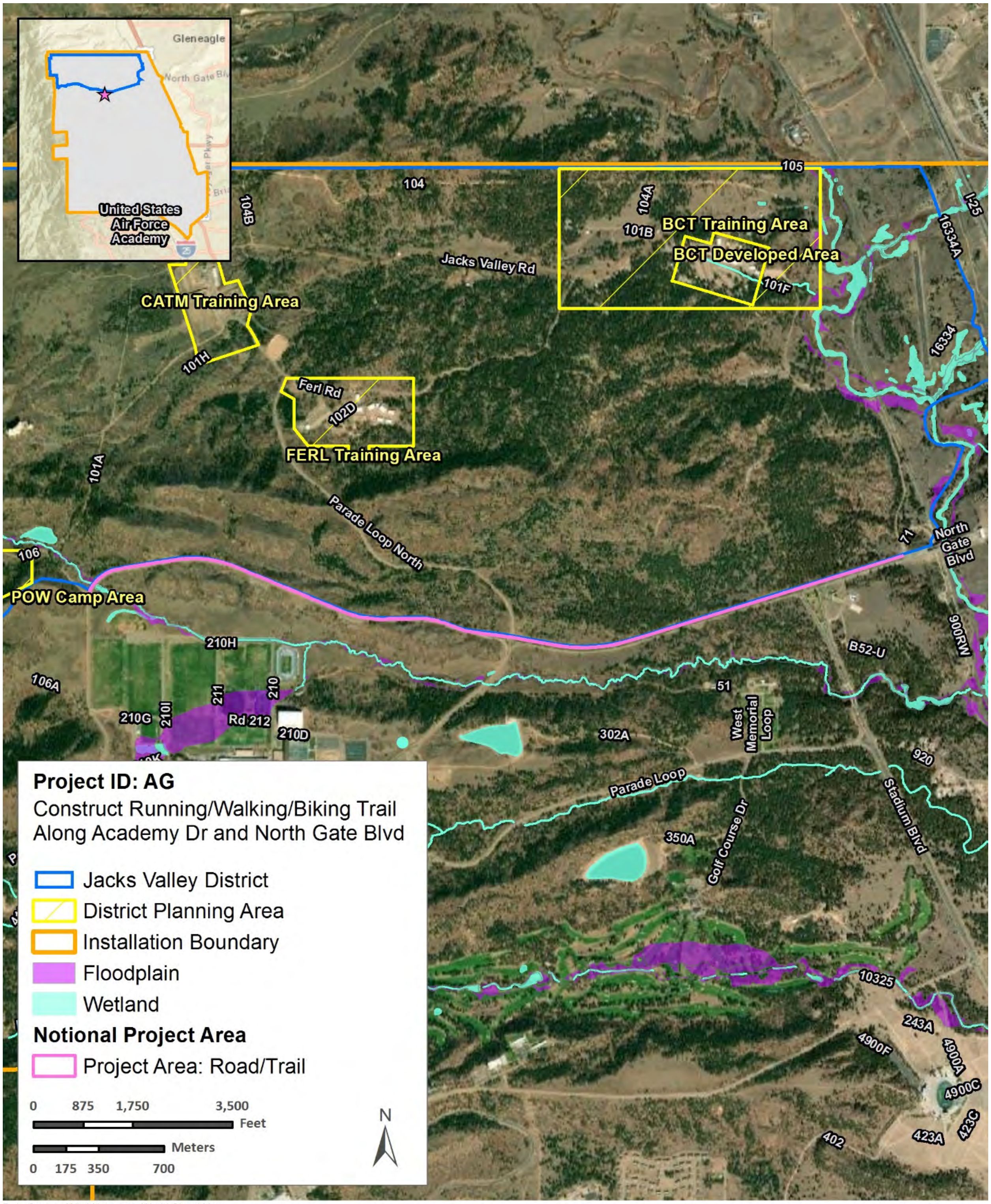

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Figure B-24. Roads and Trails Improvements: Project AG

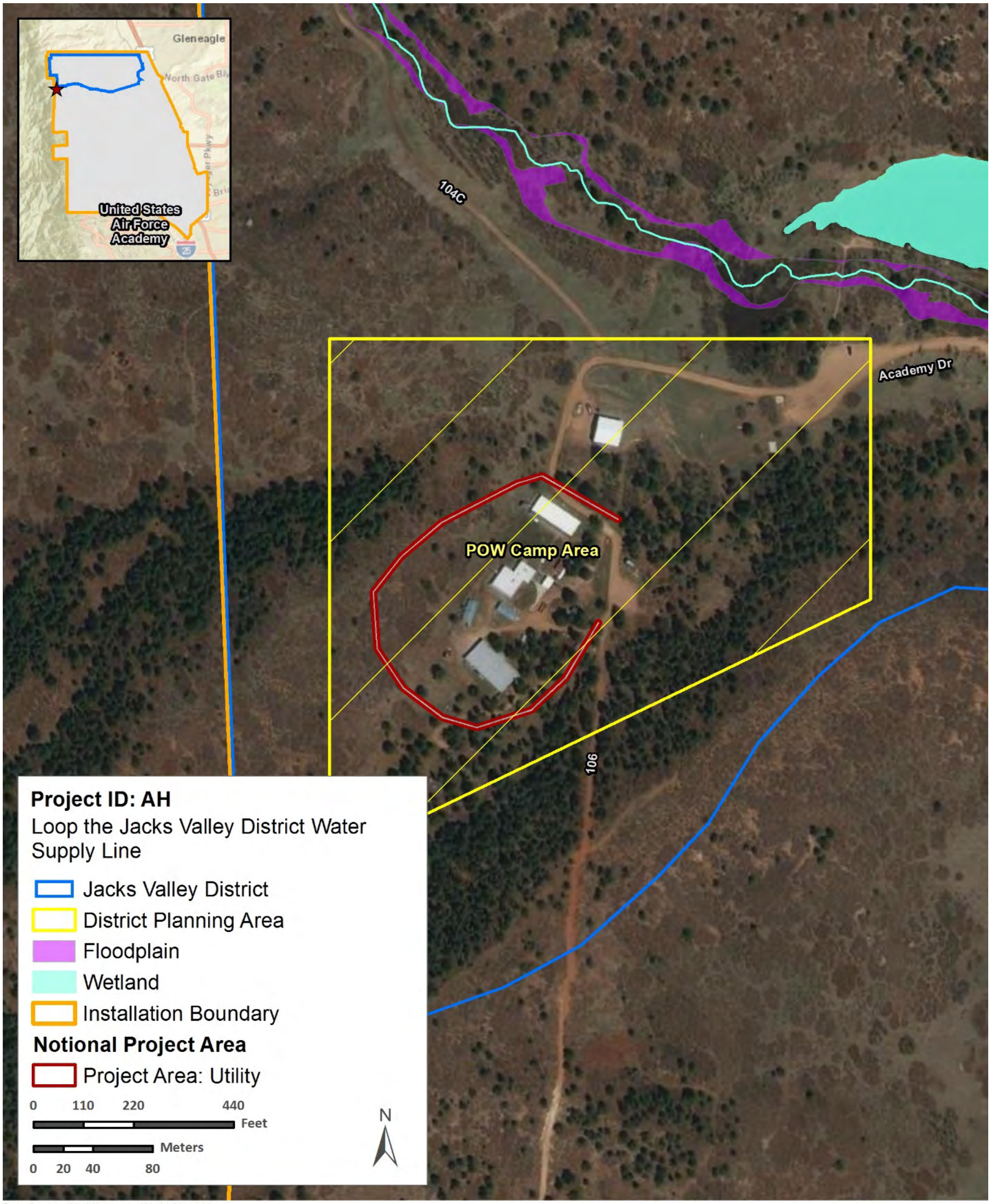

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Figure B-25. Utilities and Communications Installation: Project AH (West)

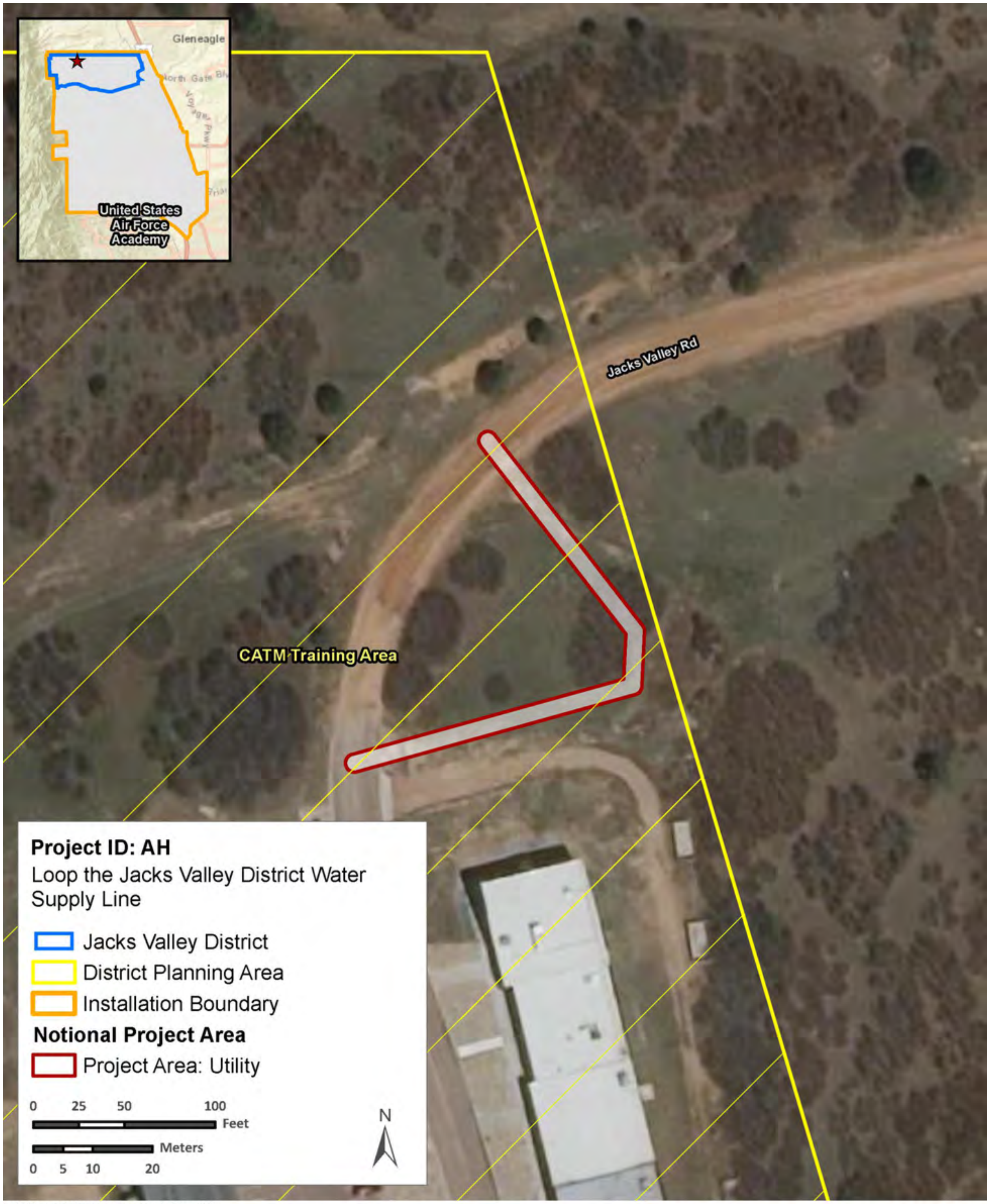

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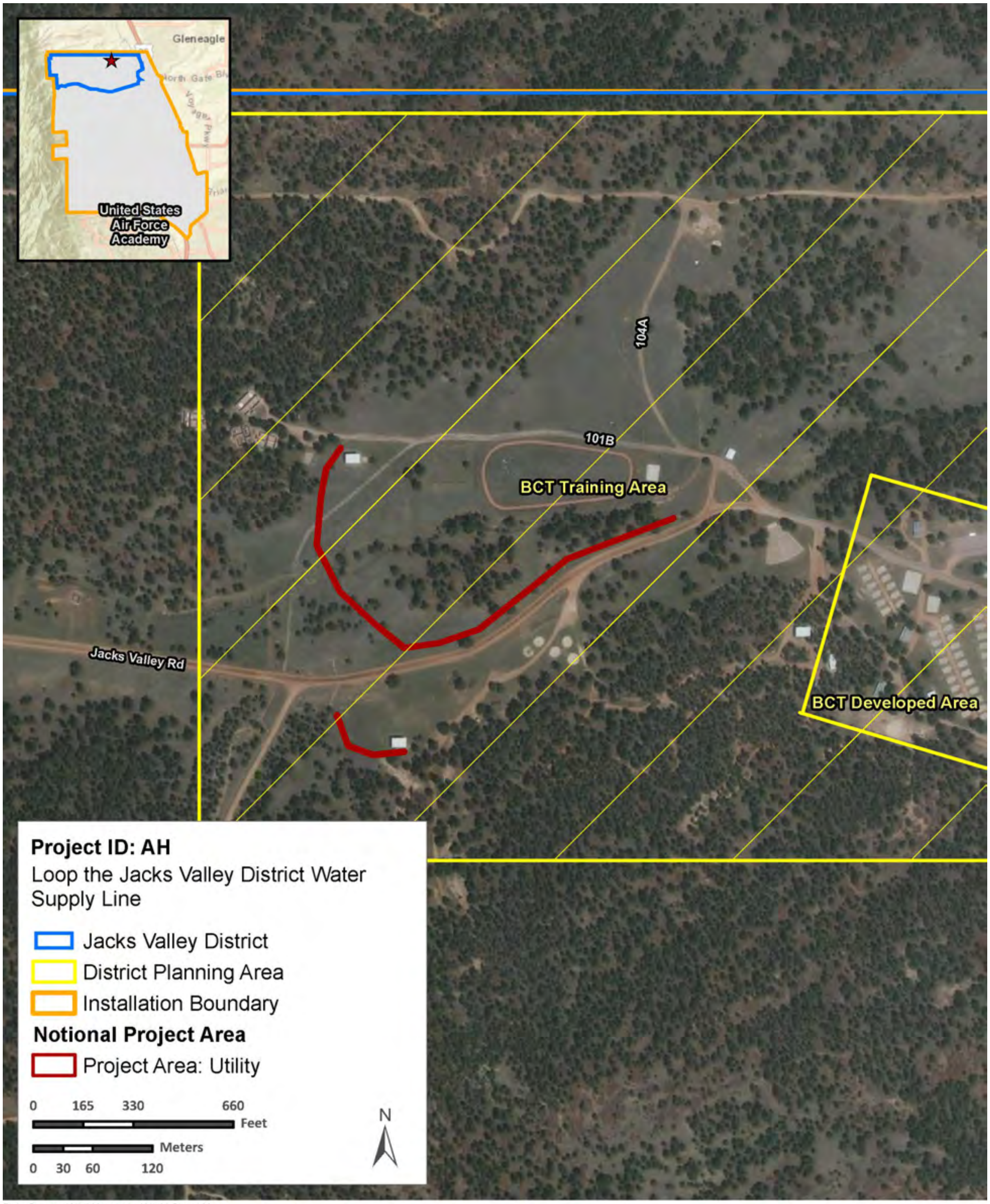
Figure B-26. Utilities and Communications Installation: Project AH (Northwest)



Data Source: World Imagery; World Street Map

Figure B-27. Utilities and Communications Installation: Project AH (Northeast)

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C

Supplemental Information for Resource Assessments

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Appendix C: Supplemental Information for Resource Assessments

This appendix continues with abbreviations and acronyms that have been used in the main document. See the inside cover sheet for definitions of abbreviations and acronyms. References cited in this appendix are included in **Section 4: References** of the main document.

C.1 Criteria for Analysis

The specific criteria for evaluating the potential environmental impacts of the Proposed Actions and alternatives are discussed by resource area. The significance of an action is also measured in terms of its context and intensity. The context and intensity of potential environmental effects are described in terms of duration, the magnitude of the impact, and whether they are adverse or beneficial, and are summarized as follows:

- **Short-term or long-term:** In general, short-term impacts are those that would occur only for a particular activity, only for a finite period, or only during the time required for construction or installation activities. Long-term impacts are those that persist after the project has been constructed and is in operation.
- **Negligible, minor, moderate, or major (significant):** These relative terms are used to characterize the magnitude or intensity of an impact. Negligible impacts are generally those that might be perceptible but are at the lower level of detection. Minor impacts are slight, but detectable. Moderate impacts are readily apparent. Major impacts are prominent and, in their context and due to their magnitude (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR § 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation or the preparation of an EIS to fulfill the policies set forth in NEPA.
- **Adverse or beneficial:** An adverse impact is one having negative or undesirable outcomes on the natural or human-made environment. A beneficial impact is one having positive outcomes on the natural or human-made environment.

BMPs and environmental protection measures are also discussed to describe how project impacts on a resource area could be minimized (see **Appendix D**). BMPs are actions that reduce potential impacts and are required by statutes, by regulations, or to fulfill permitting requirements. Environmental protection measures are actions that minimize impacts and are not required by statutes, by regulations, or to fulfill permitting requirements; instead, they are typically measures taken during the design and construction phases of a project to reduce impacts on the environment. None of the BMPs or environmental protection measures described below are needed to bring an impact below the threshold for significance.

C.2 Resources Not Carried Forward for Analysis

Based on known information for the Proposed Actions, the rationale for not conducting analyses on airspace, socioeconomics, and environmental justice resources is as follows.

C.2.1 Airspace Management

No new airspace would be designated under the Proposed Actions, and no changes in the way the existing airspace is used would occur. As a result, USAFA anticipates no short- or long-term impacts on airspace management. Therefore, airspace management is not discussed further in this EA.

C.2.2 Socioeconomics

Development in Jacks Valley would have insignificant impacts on socioeconomics. No new personnel would be added to the workforce through district development; therefore, no appreciable change to the local population and demand for housing and public and social services would occur. Beneficial impacts on the local economy would occur from the sale of construction materials and employment of local construction workers; however, the regional availability of building materials and labor would not be noticeably affected because of the limited scope of each district development project and the timing of the projects over at least 5 years. Therefore, socioeconomics is not discussed further in this EA.

C.2.3 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, require that all federal agencies address the potential effects of policies on minorities, low-income populations, and children. Because of the distance of the project areas from off-installation populated areas, no off-installation minority, low income, or youth populations would be adversely impacted by the Proposed Actions. Therefore, environmental justice is not discussed further in this EA.

C.3 Resources Analyzed in the EA

C.3.1 Land Use

DEFINITION OF THE RESOURCE

Land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in master planning and local zoning laws. Land use planning ensures orderly growth and compatible uses among adjacent property parcels or areas. The meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. In addition, a variety of land use categories result from human activity. Descriptive terms for human activity land uses generally include commercial, industrial, military, residential, agricultural, institutional, transportation, communications and utilities, and recreational.

In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land use on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its permanence.

REGULATORY OVERVIEW

Federal, USAF, and state policies and regulations, and county-level guidance and ordinances, create the regulatory framework for land use. Land owned by the U.S. Government is regulated under federal law; under the Supremacy Clause in the U.S. Constitution (Clause 2, Article VI), federal land is not subject to land use regulation by the state or county.

Federal

Federal policies that affect land use planning include the ESA, the Sikes Act, the CWA, the Energy Policy Act, NEPA, the Federal-Aid Highway Act, Government-to-Government Relations with Native American Tribal Governments, National Forest Management Act, and the Federal Land Policy and Management Act.

USAF

The JVDP, which identified the 19 Proposed Actions evaluated in this EA, was developed in accordance with UFC 2-100-01, *Installation Master Planning*, which provides land use planning, design, construction, sustainment, restoration, and modernization criteria applicable to the military departments, defense agencies, and field activities in the DoD. Other guiding documents include Air Force Pamphlet 32-1010, *Land Use Planning,* and Air Force Policy Directive 32-70, *Environmental Considerations in Air Force Programs and Activities*.

State and Local

Colorado Revised Statutes 25-65.1-101 provide protection of the lands in the state and information on land uses and systematic methods of definition, classification, and utilization. The Colorado Department of Local Affairs provides land use codes that allow users to prepare for and reduce hazards. These codes integrate avoidance and minimization measures into land use plans and standards, and provide unified land use codes for planning guidance. Additionally, the El Paso County Master Plan guides development throughout the unincorporated El Paso County, including areas in the vicinity of USAFA (EPC 2021).

C.3.2 Biological Resources

DEFINITION OF THE RESOURCE

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

REGULATORY OVERVIEW

Endangered Species Act

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

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

Migratory Bird Treaty Act

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

Bald and Golden Eagle Protection Act

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected under the Bald and Golden Eagle Protection Act, which prohibits the “take” of bald or golden eagles in the United States without a permit. The Bald and Golden Eagle Protection Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” For purposes of these guidelines, “disturb” means “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause: (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle’s return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

C.3.3 Water Resources

DEFINITION OF THE RESOURCE

Water resources are natural and human-made sources of water—including groundwater, surface water, wetlands, and floodplains—that are available for use by, and for the benefit of, humans and the environment. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

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

Surface water resources generally consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

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

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

REGULATORY OVERVIEW

Waters of the U.S. are defined in the CWA, as amended, and jurisdiction is addressed by USEPA and the U.S. Army Corps of Engineers. Encroachment into waters of the U.S. requires a permit from the federal and state government.

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

The NPDES stormwater permitting program in Colorado is regulated by USEPA Region 8. In general, the NPDES stormwater permitting program requires permits for discharges from construction sites that disturb 1 ac or more, and discharges from smaller sites that are part of a larger common plan of development or sale. Any soil disturbance requires an ESCP.

In addition, construction site owners and operators that disturb 1 ac or more of land are required to use BMPs to ensure that soil disturbed during construction activities does not pollute nearby water bodies. Construction activities disturbing 20 ac or more must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. Additionally, as of February 2, 2014, construction site owners and operators that disturb 10 ac or more of land are required to monitor discharges to ensure compliance with effluent limitations as specified by the permitting authority.

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

It is USAF policy to avoid construction of new facilities within areas containing wetlands and within the 100-year floodplain where possible per AFI 32-7064*, Integrated Natural Resources Management;* EO 11990, *Protection of Wetlands;* and EO 11988, *Floodplain Management*. A FONPA must be prepared and approved by USAFA for all Proposed Actions impacting wetland and floodplain areas.

C.3.4 Geology and Soils

DEFINITION OF THE RESOURCE

Geologic resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of geology, topography, soils, and where applicable, geologic hazards, and paleontology.

Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information is derived from field analysis based on observations of the surface and borings to identify subsurface composition.

Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Soils are 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 their structure, elasticity, strength, shrink-well potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for compatibility with construction activities or land use types.

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water.

Geologic hazards are defined as a natural geologic event that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, landslides, rock falls, ground subsidence, and avalanches.

REGULATORY OVERVIEW

Prime farmland is protected under the Farmland Protection Policy Act of 1981. The intent of the Farmland Protection Policy Act is to minimize the extent that federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The implementing procedures of the Farmland Protection Policy Act and the USDA NRCS require federal agencies to evaluate the adverse effects (direct and indirect) of their activities on prime and unique farmland, as well as farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects.

Additional regulations pertaining to geology and soils management are identified in **Section C.3.3** for groundwater and surface water runoff, sedimentation, and erosion control.

C.3.5 Cultural Resources

DEFINITION OF THE RESOURCE

A cultural resource is any prehistoric or historic resource, such as settlement sites, historic archaeological sites, historic architectural or engineering resources, or other evidence of our cultural heritage. Archaeological resources comprise areas where human activity has measurably altered the earth or where deposits of physical remains are found (e.g., projectile points and bottles) but standing structures do not remain. Resources of traditional, religious, or cultural significance can include archaeological resources, sacred sites, structures, districts, prominent topographic features, habitat, plants, animals, or minerals considered essential for the preservation of traditional culture. Architectural resources include standing buildings, structures (such as bridges and dams), landscapes, and districts composed of one or more of those resource types (NPS 1997).

The term "historic property" refers specifically to a cultural resource that is listed in, or has been determined to be eligible for listing in, the NRHP. Historic properties are generally 50 years of age or older, meet one or more significance criteria, and retain sufficient integrity to convey their significance. Resources constructed more recently may meet a criteria consideration for designation if they are of exceptional importance or have the potential to gain significance in the future.

REGULATORY OVERVIEW

Federal laws and EOs that pertain to cultural resources management include the NHPA (and implementing regulations at 36 CFR Part 800), the Archeological and Historic Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. USAFA is required to comply with USAF regulations and instructions, including the Integrated Cultural Resources Management Plan for the installation (USAFA 2019a); Air Force Manual 32-7003, *Environmental Conservation*; and AFI 90-2002, *Interactions with Federally Recognized Tribes*.

Under Section 106 of the NHPA, federal agencies must consider the effect of their undertakings on historic properties. Under this process, the federal agency evaluates the NRHP eligibility of resources within the proposed undertaking's APE and assesses the possible effects of the proposed undertaking on historic properties in consultation with SHPO and other parties. The APE is defined as the geographic area or areas within which an undertaking (project) may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.

C.3.6 Noise

DEFINITION OF THE RESOURCE

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive; noise 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 sound source, distance between source and receptor, receptor sensitivity, and time of day. Affected receptors are specific (e.g., schools, churches, hospitals) or broad (e.g., nature preserves, designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Sound varies by intensity and frequency. Sound pressure level, described in decibels, is used to quantify sound intensity. The decibel is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighing," measured in dBA, approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their dBA levels are presented in **Table C-1**.

Table C-1. Common Sounds and Sound Levels

Common Sounds Outdoor	Sound Level (dBA)	Common Sounds Indoor
Motorcycle	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Vacuum cleaner
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris 1998

Ambient sound is defined as the all-encompassing sound associated with a given environment, being usually a composite of sounds from many sources, near and far. Noise level is dependent on the surrounding environment (e.g., nearby airports, heavy traffic, open space) and the density of individuals. The noise level in a normal suburban area is approximately 55 dBA, which increases to 60 dBA for an urban residential area and to 80 dBA in the downtown section of a city (USEPA 1974). Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis.

Day-Night Level (DNL) is the primary descriptor for military noise, except for small arms. DNL combines five major factors of noise annoyance into a single index: loudness, duration, number of occurrences, time of day, and nature of the disturbance. The DNL is the time-weighted energy average sound level occurring over a 24-hour period, with a 10-decibel penalty added to the nighttime levels between 10 p.m. and 7 a.m.

Construction sound levels, caused by construction and demolition, can be well above the ambient level. A variety of sounds are emitted from loaders, trucks, pavers, and other work equipment. **Table C-2** presents a list of construction and demolition equipment that could be used to support the Proposed Actions and their corresponding noise levels. Construction and demolition equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and by up to 30 to 35 dBA in a quiet suburban area.

Table C-2. Average Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 ft (dBA)	Predicted Noise Level at 500 ft (dBA)	Predicted Noise Level at 1,000 ft (dBA)
Clearing and Grading			
Bulldozer	80	60	54
Grader	80–93	60–73	54–67
Truck	83–94	63–74	57–68
Excavation			
Backhoe	72–93	52–73	46–67
Jackhammer	81–98	61–78	55–72
Building Construction			
Concrete mixer	74–88	54–68	48–62

Construction Category and Equipment	Predicted Noise Level at 50 ft (dBA)	Predicted Noise Level at 500 ft (dBA)	Predicted Noise Level at 1,000 ft (dBA)
Welding generator	71–82	51–62	45–56
Pile driver	91–105	71–85	65–78
Crane	75–87	55–67	49–61
Paver	86–88	66–68	60–62
Miscellaneous			
Chain saw	87	67	61
Tree stump grinder	69	49	43

Sources: USEPA 1971; Predator 2007; Purdue 2000; TRS Audio 2020
Note: Equipment fitted with noise control devices (e.g., mufflers) and use of sound barriers are expected to result in lower noise levels than shown in this table.

REGULATORY OVERVIEW

Federal Regulations

The federal government established noise guidelines and regulations to protect citizens from potential hearing damage and various other adverse physiological, psychological, and social effects associated with noise. According to the Federal Aviation Administration and U.S. Department of Housing and Urban Development criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where noise exposure exceeds 75 dBA, “normally unacceptable” in regions exposed to noise between 65 and 75 dBA, and “normally acceptable” in areas exposed to noise of 65 dBA or less. For outdoor activities, USEPA recommends 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA 1974).

State and Local Regulations

The Colorado Revised Statutes 25-12-103 provide maximum permissible sound levels specific to time of day and land use zone. Noise regulations are more specifically driven by city authorities. The City of Colorado Springs Code of Ordinances, Chapter 9, Article 8, Parts 1 and 2, describe noises that are prohibited and outline noise limits for general noise sources and vehicles. Noise levels in Colorado Springs are restricted by time of day and zone. All construction projects and railroad rights-of-way are subject to the requirements applicable to industrial zones, which allow for greater noise levels than all other zones. Exceptions to these restrictions include activities approved in a hardship permit and generating sound to alert listeners of an emergency.

C.3.7 Air Quality

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, the six pollutants defining air quality, called “criteria pollutants,” are CO, sulfur dioxide, nitrogen dioxide, ozone, PM_{10} and $PM_{2.5}$, and lead. CO, SO_X, and some particulates are emitted directly into the atmosphere from emissions sources. Nitrogen dioxide, ozone, and some particulates are formed through atmospheric and chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. VOCs and NO_X are precursors of ozone and are used to represent ozone generation.

Global climate change refers to long-term fluctuations in temperature, precipitation, wind, sea level, and other elements of Earth's climate system. Ways in which the Earth's climate system may be influenced by changes in the concentration of various gases in the atmosphere have been discussed worldwide. Of particular interest, GHGs are gas emissions that trap heat in the atmosphere. These emissions occur from 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 across the globe.

REGULATORY OVERVIEW

USEPA has established NAAQS (40 CFR Part 50) for the criteria pollutants to protect against adverse health and welfare effects. Areas that are, and have historically been, in compliance with the NAAQS or have not been evaluated for 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 a State Implementation Plan to ensure continued attainment. The Colorado Department of Public Health and Environment maintains a State Implementation Plan describing all of the air pollution control measures and strategies adopted by the state, and approved by USEPA, for attainment of all NAAQS (40 CFR § 52.320 et seq.).

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 tpy) vary by pollutant and also depend on the severity of nonattainment status for the air quality management area in question.

USEPA regulates synthetic minor air emissions sources that emit, or have the potential to emit, regulated air pollutants in amounts that are at or above the thresholds for major sources as cited in 40 CFR § 52.21 (100 tpy for criteria pollutants), but has added restrictions so that the potential to emit is less than such amounts for major sources. The potential to emit for a synthetic minor emissions source is limited by additional permits to stay below major emission source thresholds. Synthetic minor air emissions sources are permitted under 40 CFR § 49.158 and apply to stationary air emissions sources.

The Colorado Department of Public Health and Environment executes and oversees air quality permitting in Colorado, including air quality permits for construction activities. An Air Pollutant Emissions Notice for Land Development must be submitted to the Colorado Department of Public Health and Environment for projects that would disturb more than 25 contiguous ac of land or that would last more than 6 months. All construction activities must comply with Colorado's fugitive dust rules (5 Code of Colorado Regulations § 1001-1 et seq.), which require construction contractors to limit fugitive dust emissions and prevent such emissions from being transported outside the project area. A project that requires clearing or leveling of more than 5 ac in an attainment area must employ all available and practical suppression methods to minimize fugitive dust emissions.

The Greenhouse Gas Mandatory Reporting Rule is a federal mandate requiring all facilities to report GHG emissions to USEPA if a facility emits 25,000 metric tons of CO_2e or more per year. CO_2e signifies the amount of carbon dioxide that would have an equivalent global warming impact and is used as a common unit to describe GHGs.

C.3.8 Health and Safety

DEFINITION OF THE RESOURCE

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Health and safety addresses both worker and public health and safety during and following construction and demolition. This section addresses the well-being, safety, and health of members of the public, contractors, and USAF personnel associated with implementation of the Proposed Actions.

REGULATORY OVERVIEW

The health and safety of onsite military and civilian personnel, including contractors, are safeguarded by numerous DoD and USAF regulations designed to comply with standards issued by the Occupational Safety and Health Administration and USEPA. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment, administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

C.3.9 Hazardous Materials and Wastes

DEFINITION OF THE RESOURCE

Evaluation of hazardous materials and wastes focuses on the storage, transportation, handling, and use of hazardous materials, as well as the generation, storage, transportation, handling, and disposal of hazardous wastes. In addition to being a threat to humans, the improper release or storage of hazardous materials, hazardous wastes, and petroleum products can threaten the health and well-being of wildlife species, habitats, soil systems, and water resources.

REGULATORY OVERVIEW

Hazardous Materials, Hazardous Wastes, and Petroleum Products

Hazardous materials are defined by 49 CFR § 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by U.S. Department of Transportation regulations in 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act at 42 USC § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed."

Toxic Substances

Toxic substances are substances that might pose a risk to human health and are addressed separately from hazardous materials and hazardous wastes. A toxic substance is a chemical mixture that may present an unreasonable risk of injury to health or the environment. These substances include ACMs, LBP, and PCBs, all of which are typically found in older buildings and utilities infrastructure. USEPA is given the authority to regulate these substances by the Toxic Substances Control Act (15 USC § 53).

Asbestos is regulated by USEPA under the Clean Air Act; Toxic Substances Control Act; and Comprehensive Environmental Response, Compensation, and Liability Act. USEPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM. USEPA implemented several bans on various ACMs between 1973 and 1990, so ACMs are most likely in older buildings (i.e., constructed before 1990). ACMs are generally found in building materials such as floor tiles, mastic, roofing materials, pipe wrap, and wall plaster. LBP was commonly used prior to its ban in 1978; therefore, any building constructed prior to 1978 may contain LBP. PCBs are human-made chemicals that persist in the environment and were widely used in building materials (e.g., caulk) and electrical products prior to their ban in 1979. Structures constructed prior to 1979 potentially include PCB-containing building materials.

Environmental Contamination

The Comprehensive Environmental Response, Compensation, and Liability Act governs response or cleanup actions to address releases of hazardous substances, pollutants, and contaminants into the environment and includes federal facilities such as USAFA. The Defense Environmental Restoration Program was formally established by Congress in 1986 to provide for the cleanup of DoD property at active installations, Base Realignment and Closure installations, and formerly used defense sites throughout the United States and its territories. Two restoration programs were developed under the Defense Environmental Restoration Program: the ERP and the Military Munitions Response Program. The ERP addresses contaminated sites while the Military Munitions Response Program addresses nonoperational military ranges and other sites suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituents. Each site is investigated, and remedial actions are taken under the supervision of applicable federal and state regulatory programs. When no further remedial action is necessary for a given site, the site is closed, and it no longer represents a threat to human health.

Radon

Radon is a naturally occurring odorless and colorless radioactive gas found in soils and rocks that can lead to the development of lung cancer. Radon tends to accumulate in enclosed spaces, usually those that are below ground and poorly ventilated (e.g., basements). USEPA established a guidance radon level of 4 pCi/L in indoor air for residences, and radon levels above this amount are considered a health risk to occupants.

C.3.10 Infrastructure

DEFINITION OF THE RESOURCE

Infrastructure consists of the systems and physical structures that enable a population to function in a specified area. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as urban or developed. The availability of infrastructure and its capacity for expansion are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include utilities and transportation. Utilities include the electrical system, water supply, wastewater system, stormwater system, natural gas, liquid fuel, communications, and solid waste. Transportation includes gate access, on-installation roadways, off-installation roadways that feed into the installation and the access gates, and parking areas on the installation. Pedestrian facilities, public transportation, and rail are also elements of transportation. In addition, the transportation section discusses airfields. The infrastructure descriptions in this section provide a brief overview of each infrastructure component and comments on its existing general condition at the installation.

REGULATORY OVERVIEW

Utilities and transportation on the installation and in Jacks Valley are managed by USAFA. Most utilities are regulated by CSU or the City of Colorado Springs. The installation's WWTP, which provides service to Jacks Valley, is a federally owned treatment works operating under its own Federally Owned Discharge Permit and must report the levels of discharge to USEPA on a monthly basis (USAFA 2018a).

On-installation street operations and maintenance, and parking are managed by USAF. Off-installation street and highway operations are primarily regulated by the Federal Highway Administration and implemented by the Colorado Department of Transportation.

D

Other Environmental Considerations

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Appendix D: Other Environmental Considerations

This appendix continues with abbreviations and acronyms that have been used in the main document. See the inside cover sheet for definitions of abbreviations and acronyms. References cited in this appendix are included in **Section 4: References** of the main document.

D.1 Best Management Practices and Environmental Protection Measures

The Proposed Actions would not result in significant adverse impacts. Additionally, BMPs, environmental protection measures, and other minimization measures would be implemented to further reduce non-significant adverse impacts.

General BMPs that could be included as part of the Proposed Actions, as practicable, are summarized as follows:

- BMPs such as inspecting and cleaning construction equipment to remove soil, plants, and seeds; ensuring all fill is as free of nonnative plant propagules as is practicable; and revegetating disturbed areas with native plant species should be implemented during project activities to minimize the spread of noxious weeds and other adverse impacts on vegetation.

- If construction activities are scheduled to occur during the migratory bird nesting season (April 15 through August 1), pre-construction nest surveys should be conducted in and near construction areas to avoid any potential take under the MBTA.

- Construction activities would be staged to allow for the stabilization of disturbed soils. This environmental protection measure would minimize adverse impacts associated with soil and water resources.

- Fugitive dust control techniques such as watering and stockpiling would be used to minimize adverse impacts from dust emissions. All such techniques would comply with applicable regulations. These environmental protection measures would minimize adverse impacts associated with air quality, soil, and water resources.

- Soil erosion control measures such stabilizing construction entrances; covering soil stockpiles; installing inlet and outlet protection, silt fencing, berms, swales, basins, and traps; employing slope stabilization; and using erosion control blankets would be implemented as appropriate. These environmental protection measures would minimize adverse impacts associated with soil and water resources.

- Stormwater management would be used as appropriate during construction to minimize offsite runoff. Following construction, stormwater management systems would ensure that predevelopment site hydrology is maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. These environmental protection measures would minimize adverse impacts associated with water resources.

- Measures would be taken to prevent pollutants from reaching the soil, groundwater, or surface water. During project activities, contractors would be required to perform daily inspections of equipment, maintain appropriate spill-containment materials on site, and store all fuels and other materials in appropriate containers. Equipment maintenance activities would not be conducted on construction sites. These environmental protection measures would minimize adverse impacts associated with soil, water resources, and hazardous materials and wastes.

- Physical barriers and "no trespassing" signs would be placed around demolition and construction areas to deter unauthorized personnel. All construction vehicles and equipment would be locked or otherwise secured when not in use. These environmental protection measures would minimize adverse impacts associated with health and safety.

- Construction equipment would be maintained to the manufacturer's specifications to minimize adverse impacts associated with health and safety.

D.2 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the impacts that use of these resources would have on future generations. Irreversible impacts primarily result from use or destruction of a specific resource that cannot be replaced, or retrieved, within a reasonable time frame (e.g., energy and minerals). The irreversible environmental changes that would result from implementation of the Proposed Actions involve floodplains, biological habitat, and the consumption of material resources, energy resources, and human resources. The use of these resources is considered to be permanent.

Floodplains. The Proposed Actions would not involve the construction of structures or impervious surfaces in the 100-year floodplain. All development must consider encroachment on regulated floodplains in Jacks Valley and must comply with federal, state, and local floodplain management and construction guidelines.

Biological Resources. The Proposed Action would result in the minimal loss of vegetation and wildlife habitat. This loss would not be significant.

Material Resources. Building materials (for construction of facilities), and various material supplies (for infrastructure) would be irreversibly consumed for implementation of the Proposed Actions. Most of the materials are not in short supply and would not limit other unrelated construction activities, and their loss would not be considered significant.

Energy Resources. No significant impacts would be expected on energy resources used for the Proposed Actions, although any nonrenewable energy resources consumed would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel fuel). During construction, gasoline and diesel fuel would be used for the operation of construction vehicles. Consumption of these energy resources would not place a significant demand on their availability in the region.

Human Resources. The use of human resources for construction is considered an irretrievable loss, but only in that it would preclude such persons from engaging in other work activities. The use of human resources for the Proposed Actions represents employment opportunities and is considered beneficial.

D.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Actions. As discussed in detail in **Section 3**, the Proposed Actions would result in short- and long-term, adverse impacts associated with construction activities, including increased noise, increased air emissions, use and generation of small amounts of hazardous materials and wastes, use of fossil fuels (a nonrenewable natural resource), and generation of demolition and construction waste. None of these effects would be significant.

D.4 Relationship between Short-term Uses and Long-term Productivity

Short-term use of the biophysical components of the human environment includes impacts, usually related to construction activities, that occur over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

Under the Proposed Actions, short-term uses of the environment would result in short-term, less than significant, adverse impacts on biological resources, water resources, geology and soils, noise, air quality, health and safety, hazardous materials and wastes, and infrastructure and transportation from construction activities. Long-term adverse impacts are not expected because of the interim nature of the construction. The nature of activities for the Proposed Actions would not differ from current use of Jacks Valley and would not result in the additional intensification of land use in the surrounding area. Implementation of the Proposed Actions would not result in significant impacts on sensitive resources. The Proposed Actions also would not represent a significant loss of open space. The long-term, beneficial impacts of implementing the Proposed Actions would support the ongoing and future training missions of USAFA.

Planned demolition activities within Jacks Valley would support the goals in the JVDP to provide for safe and secure training, create multipurpose collaborative spaces, maximize natural open spaces, and promote or increase accessibility and connectivity. These changes would represent long-term benefits to USAFA.

D.5 Compatibility with Existing Plans and Policies

The Proposed Actions would occur on government-owned lands on which USAF currently operates. The nature of activities for the Proposed Actions would not differ from current USAF use of these areas. Demolition and construction under the Proposed Actions would be conducted in accordance with applicable federal, regional, state, and local land use plans, policies, and controls. Proposed development would be consistent with the goals and visions outlined in the JVDP and the 2018 USAFA Installation Development Plan.

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E

Biological Resources Correspondence

Appendix E: Biological Resources Correspondence

This appendix provides the correspondence from the U.S. Fish and Wildlife Service to the U.S. Air Force Academy on July 29, 2021, that documents the determination and agreement that the Proposed Actions, and specifically Project AG, would not have adverse effects on Preble's meadow jumping mouse (*Zapus hudsonius preblei*).

From: Salamack, Kristin A <kristin_salamack@fws.gov>
Sent: Thursday, July 29, 2021 12:18 PM
To: MIHLBACHLER, BRIAN S CIV USAF USAFA 10 CES/CEIEA <brian.mihlbachler@us.af.mil>
Subject: [Non-DoD Source] Early Project Coordination Request - North Gate Boulevard Hiking/Biking Trail

Hello Brian,

On July 22, 2021, the U.S. Fish and Wildlife Service (Service) received a request for technical assistance regarding a new hiking and biking trail along North Gate Boulevard within the U.S. Airforce Academy (Academy) boundary. We previously concluded in a similar technical assistance request on December 1, 2003, that activities in mown areas within 5-20 feet of roadways at the Academy would not have direct adverse effects to the Preble's meadow jumping mouse in areas that are regularly mown and maintained. We agree that this project meets the same criteria and therefore; an acres of roadside/trail maintenance within 20 feet on either side of the trail inside the Preble's Conservation Zone do not need to be accounted for under the Conservation Plan as impacts under the Repair and Maintenance portion.

Further, we will work with Academy staff to include an exemption for long-term roadside

maintenance within the Conservation Zone in the revised Conservation Plan/Agreement.

Thank you and please let me know if there are any questions.

Kristin Salamack (she/her/hers)
CDOT/USFWS Liaison
Colorado Ecological Services Field Office
134 Union Blvd, Lakewood, CO 80228
Office: 303/236-4748 II Mobile: 518/441-2827

COLORADO
Department of Transportation
Division of Transportation Development

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F

Section 106 Consultation

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Appendix F: Section 106 Consultation

This appendix provides the correspondence from the State Historic Preservation Officer and documentation for the Section 106 consultation for the projects addressed in the Environmental Assessment and the Jacks Valley District Plan. A copy of the Programmatic Agreement will be included in this Appendix once it is executed.

HISTORY COLORADO

Erin M. Manning
Deputy Director
10th Civil Engineer Squadron
U.S. Air Force Academy Colorado
Department of the Air Force
8120 Edgerton Drive, Suite 40
USAF Academy, Colorado 80840-2400

RE: 15 Projects in the USAFA Cadet Area District, United States Air Force Academy, El Paso County, Colorado (HC# 76727)

Dear Ms. Manning,

Thank you for your correspondence received by our office on July 14, 2021 requesting review for the above referenced undertaking submitted under Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations 36 CFR 800. We also appreciate the additional information provided by Erwin Roemer through email on July 19, 2021.

We understand that the subject undertaking consists of 15 projects as outlined in the attachment submitted with your July 14, 2021 correspondence. The projects will occur in previously disturbed locations and will avoid disturbing historic properties. Based on the documentation provided, we agree that your finding of no adverse effects [36 CFR 800.5(d)(1)] to historic properties is appropriate for the subject undertaking.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register eligibility criteria (36 CFR 60.4) in consultation with our office pursuant to 36 CFR 800.13. Also, should the consulted-upon scope of the work change, please contact our office for continued consultation under Section 106 of the NHPA.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings. Please note that our compliance letter does not end the 30-day review period provided to other consulting parties.

Thank you for the opportunity to comment. If you have any questions, please contact Matthew Marques, Section 106 Compliance Manager, at (303) 866-4678, or matthew.marques@state.co.us.

Sincerely,

Dr. Holly Kathryn Norton
Digitally signed by Dr. Holly Kathryn Norton
Date: 2021.07.22 16:02:06 -06'00'

Steve Turner, AIA
State Historic Preservation Officer

We are now accepting electronic consultation through our secure file transfer system, MoveIT. Directions for digital submission and registration for MoveIT are available at https://www.historycolorado.org/submitting-your-data-preservation-programs.

HISTORY COLORADO | 1200 BROADWAY | DENVER, CO 80203 | 303-447-8679 | HISTORYCOLORADO.ORG

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G

Air Quality Modeling and Reports

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project D: Construct Regional Indoor Firing Range

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.653		
NOx	1.833		
CO	2.015	100	No
SOx	0.005		
PM 10	1.294		
PM 2.5	0.075		
Pb	0.000		
NH3	0.002		
CO2e	467.2		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.003		
NOx	0.152		
CO	0.038	100	No
SOx	0.328		
PM 10	0.009		
PM 2.5	0.003		
Pb	0.000		
NH3	0.000		
CO2e	171.4		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.003		
NOx	0.152		
CO	0.038	100	No
SOx	0.328		
PM 10	0.009		
PM 2.5	0.003		
Pb	0.000		
NH3	0.000		
CO2e	171.4		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project D: Construct Regional Indoor Firing Range

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project D: Construct Regional Indoor Firing Range
3.	Heating	Heat Regional Indoor Firing Range

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project D: Construct Regional Indoor Firing Range

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area totaling 30,625 sq ft. Site grading will begin in January 2022 and last approximately 4 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Construction:
Construct the 30,625 sq ft regional indoor firing range. Height of the building was assumed to be 30 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.653265
SO_x	0.004773
NO_x	1.832674
CO	2.015207
PM 10	1.293605

Pollutant	Total Emissions (TONs)
PM 2.5	0.074720
Pb	0.000000
NH_3	0.001589
CO_2e	467.2

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30625
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 8
Number of Days: 0

2.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 30625
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.2.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0340	0.0006	0.2783	0.2694	0.0116	0.0116	0.0030	61.069
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0260	0.0003	0.1557	0.1772	0.0077	0.0077	0.0023	25.661

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

2.3 Architectural Coatings Phase

2.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

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

2.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 30625
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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

3. Heating

3.1 General Information & Timeline Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat Regional Indoor Firing Range

- Activity Description:
Heat regional indoor firing range (30,625 sq ft).

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.002581
SO_x	0.327915
NO_x	0.151813
CO	0.037953
PM 10	0.009412

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.003492
Pb	0.000000
NH_3	0.000000
CO_2e	171.4

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 30625
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0694

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.34	43.2	20	5	1.24	0.46			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
FC_{HER}= HA * EI / HV / 1000

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year

$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project M: Construct FERL Storage Facility

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: (484) 612-1060
Phone Number: Carolyn.Hein@hdrinc.com

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.239		
NOx	1.139		
CO	1.291	100	No
SOx	0.003		
PM 10	0.204		
PM 2.5	0.045		
Pb	0.000		
NH3	0.001		
CO2e	320.0		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.023		
CO	0.006	100	No
SOx	0.050		
PM 10	0.001		
PM 2.5	0.001		
Pb	0.000		
NH3	0.000		
CO2e	26.0		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.023		
CO	0.006	100	No
SOx	0.050		
PM 10	0.001		
PM 2.5	0.001		
Pb	0.000		
NH3	0.000		
CO2e	26.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor — 5/26/2021 DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project M: Construct FERL Storage Facility

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: (484) 612-1060
Phone Number: Carolyn.Hein@hdrinc.com

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project M: Construct FERL Storage Facility
3.	Heating	Heat FERL Storage Facility

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project M: Construct FERL Storage Facility

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area totaling 4,000 sq ft. Site grading will begin in January 2022 and last approximately 4 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Construction:
Construct the 4,000 sq ft FERL storage facility. Height of the building was assumed to be 20 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.239318
SO_x	0.003266
NO_x	1.139464
CO	1.290886
PM 10	0.203887

Pollutant	Total Emissions (TONs)
PM 2.5	0.044672
Pb	0.000000
NH_3	0.000713
CO_2e	320.0

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 4000
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 8

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Days: 0

2.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 4000
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

2.2.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

2.3 Architectural Coatings Phase

2.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

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

2.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 4000
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

2.3.3 Architectural Coatings Phase Emission Factor(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat FERL Storage Facility

- Activity Description:
Heat FERL storage facility (4,000 sq ft).

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000391
SO_x	0.049742
NO_x	0.023029
CO	0.005757
PM 10	0.001428

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000530
Pb	0.000000
NH_3	0.000000
CO_2e	26.0

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 4000
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0806

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.34	43.2	20	5	1.24	0.46			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
$FC_{HER} = HA * EI / HV / 1000$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year
$HE_{POL} = FC * EF_{POL} / 2000$

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project R: Construct ATV Storage Facility

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.190		
NOx	0.957		
CO	1.179	100	No
SOx	0.003		
PM 10	0.109		
PM 2.5	0.038		
Pb	0.000		
NH3	0.001		
CO2e	272.3		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.013		
CO	0.003	100	No
SOx	0.028		
PM 10	0.001		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	14.6		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.013		
CO	0.003	100	No
SOx	0.028		
PM 10	0.001		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	14.6		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project R: Construct ATV Storage Facility

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project R: Construct ATV Storage Facility
3.	Heating	Heat ATV Storage Facility

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project R: Construct ATV Storage Facility

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Demolition:
Demolish Building 1068 (1,119 sq ft). Demolition would begin in January 2022 and last approximately 2 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Site grading:
Grade entire demolition/construction project area totaling 3,359 sq ft. Site grading will begin in March 2022 and last approximately 2 months.

Construction:
Construct the 2,240 sq ft ATV storage facility. Height of the building was assumed to be 20 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.189914
SO_x	0.002791
NO_x	0.957466
CO	1.179468
PM 10	0.109331

Pollutant	Total Emissions (TONs)
PM 2.5	0.037758
Pb	0.000000
NH_3	0.000702
CO_2e	272.3

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- 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): 1119
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	0.0410	0.0006	0.2961	0.3743	0.0148	0.0148	0.0037	58.556
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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: 3
Start Quarter: 1
Start Year: 2022

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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): 3359
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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

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	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 8
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2240
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 (%)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	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

2.3.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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)

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$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

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

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 2
Number of Days: 0

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 2240
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

2.4.3 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.4.4 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
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

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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

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat ATV Storage Facility

- Activity Description:
Heat ATV storage facility (2,240 sq ft).

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000219
SO_x	0.027855
NO_x	0.012896
CO	0.003224
PM 10	0.000800

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000297
Pb	0.000000
NH_3	0.000000
CO_2e	14.6

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 2240
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0806

- Default Settings Used: Yes

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.34	43.2	20	5	1.24	0.46			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
FC_{HER}= HA * EI / HV / 1000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project T: Construct Consolidated BCT Facility

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.648		
NOx	1.664		
CO	1.908	100	No
SOx	0.004		
PM 10	0.867		
PM 2.5	0.068		
Pb	0.000		
NH3	0.002		
CO2e	423.5		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.002		
NOx	0.161		
CO	0.040	100	No
SOx	0.348		
PM 10	0.008		
PM 2.5	0.002		
Pb	0.000		
NH3	0.000		
CO2e	182.1		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.002		
NOx	0.161		
CO	0.040	100	No
SOx	0.348		
PM 10	0.008		
PM 2.5	0.002		
Pb	0.000		
NH3	0.000		
CO2e	182.1		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project T: Construct Consolidated BCT Facility

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project T: Construct Consolidated BCT Facility
3.	Heating	Heat Consolidated BCT Facility

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project T: Construct Consolidated BCT Facility

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Demolition:
Demolish Buildings 1040, 1070, 1099, and 1075 (6,279 total sq ft). Demolition would begin in January 2022 and last approximately 2 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Site grading:
Grade entire demolition/construction project area totaling 38,815 sq ft. Site grading will begin in March 2022 and last approximately 2 months.

Construction:
Construct the 32,536 sq ft consolidated BCT facility. Height of the building was assumed to be 30 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.647668
SO_x	0.004332
NO_x	1.664182
CO	1.907564
PM 10	0.867141

Pollutant	Total Emissions (TONs)
PM 2.5	0.068220
Pb	0.000000
NH_3	0.001649
CO_2e	423.5

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- 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): 6279
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	0.0410	0.0006	0.2961	0.3743	0.0148	0.0148	0.0037	58.556
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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: 3
Start Quarter: 1
Start Year: 2022

- Phase Duration

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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): 38815
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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

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	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 8
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 32536
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

2.3.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0340	0.0006	0.2783	0.2694	0.0116	0.0116	0.0030	61.069
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0260	0.0003	0.1557	0.1772	0.0077	0.0077	0.0023	25.661

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

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

2.4 Architectural Coatings Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

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

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 32536
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

2.4.3 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.4.4 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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat Consolidated BCT Facility

- Activity Description:
Heat consolidated BCT facility (32,536 sq ft).

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.001613
SO_x	0.348377
NO_x	0.161286
CO	0.040321
PM 10	0.008064

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.002016
Pb	0.000000
NH_3	0.000000
CO_2e	182.1

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Area of floorspace to be heated (ft^2): 32536
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Industrial (10 - 250 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0694

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.2	43.2	20	5	1	0.25			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
$FC_{HER} = HA * EI / HV / 1000$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year
$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project U: Construct Dining Facility Storage

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.231		
NOx	1.138		
CO	1.292	100	No
SOx	0.003		
PM 10	0.176		
PM 2.5	0.045		
Pb	0.000		
NH3	0.001		
CO2e	319.8		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.019		
CO	0.005	100	No
SOx	0.041		
PM 10	0.001		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	21.4		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.019		
CO	0.005	100	No
SOx	0.041		
PM 10	0.001		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	21.4		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project U: Construct Dining Facility Storage

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project U: Construct Dining Facility Storage
3.	Heating	Heat Dining Facility Storage

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project U: Construct Dining Facility Storage

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area totaling 3,300 sq ft. Site grading will begin in January 2022 and last approximately 4 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Construction:
Construct the 3,300 sq ft dining facility storage. Height of the building was assumed to be 20 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.231226
SO_x	0.003264
NO_x	1.138356
CO	1.292208
PM 10	0.175995

Pollutant	Total Emissions (TONs)
PM 2.5	0.044638
Pb	0.000000
NH_3	0.000717
CO_2e	319.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 3300
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 8

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Number of Days: 0

2.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 3300
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

2.2.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

2.3 Architectural Coatings Phase

2.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

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

2.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 3300
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

2.3.3 Architectural Coatings Phase Emission Factor(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat Dining Facility Storage

- Activity Description:
Heat dining facility storage (3,300 sq ft).

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000323
SO_x	0.041037
NO_x	0.018999
CO	0.004750
PM 10	0.001178

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000437
Pb	0.000000
NH_3	0.000000
CO_2e	21.4

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 3300
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0806

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.34	43.2	20	5	1.24	0.46			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
FC_{HER}= HA * EI / HV / 1000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project Z: Construct Four Training Course Restrooms

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.204		
NOx	1.134		
CO	1.289	100	No
SOx	0.003		
PM 10	0.083		
PM 2.5	0.045		
Pb	0.000		
NH3	0.001		
CO2e	318.4		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.006		
CO	0.001	100	No
SOx	0.012		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	6.2		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.006		
CO	0.001	100	No
SOx	0.012		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	6.2		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project Z: Construct Four Training Course Restrooms

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	Project Z: Construct Four Training Course Restrooms
3.	Heating	Heat Four Training Course Restrooms

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project Z: Construct Four Training Course Restrooms

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area totaling 960 sq ft. Site grading will begin in January 2022 and last approximately 4 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Construction:
Construct the 960 sq ft training course restrooms. Height of the building was assumed to be 20 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.203539
SO_x	0.003252
NO_x	1.134046
CO	1.289066
PM 10	0.082739

Pollutant	Total Emissions (TONs)
PM 2.5	0.044506
Pb	0.000000
NH_3	0.000683
CO_2e	318.4

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 960
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 8

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Days: 0

2.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 960
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

2.2.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

2.3 Architectural Coatings Phase

2.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

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

2.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 960
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

2.3.3 Architectural Coatings Phase Emission Factor(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat Four Training Course Restrooms

- Activity Description:
Heat training course restrooms (960 sq ft).

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000094
SO_x	0.011938
NO_x	0.005527
CO	0.001382
PM 10	0.000343

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000127
Pb	0.000000
NH_3	0.000000
CO_2e	6.2

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 960
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0806

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.34	43.2	20	5	1.24	0.46			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
FC_{HER} = HA * EI / HV / 1000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year
HE_{POL} = FC * EF_{POL} / 2000

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project AA: Construct CBRNE Facility

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.239		
NOx	1.139		
CO	1.291	100	No
SOx	0.003		
PM 10	0.204		
PM 2.5	0.045		
Pb	0.000		
NH3	0.001		
CO2e	320.0		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.023		
CO	0.006	100	No
SOx	0.050		
PM 10	0.001		
PM 2.5	0.001		
Pb	0.000		
NH3	0.000		
CO2e	26.0		

2024 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.023		
CO	0.006	100	No
SOx	0.050		
PM 10	0.001		
PM 2.5	0.001		
Pb	0.000		
NH3	0.000		
CO2e	26.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project AA: Construct CBRNE Facility

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project AA: Construct CBRNE Facility
3.	Heating	Heat CBRNE Facility

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project AA: Construct CBRNE Facility

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area totaling 4,000 sq ft. Site grading will begin in January 2022 and last approximately 4 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Construction:
Construct the 4,000 sq ft CBRNE facility. Height of the building was assumed to be 20 ft. Building construction would begin in May 2022 and last approximately 8 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.239318
SO_x	0.003266
NO_x	1.139464
CO	1.290886
PM 10	0.203887

Pollutant	Total Emissions (TONs)
PM 2.5	0.044672
Pb	0.000000
NH_3	0.000713
CO_2e	320.0

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 4000
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Building Construction Phase

2.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 8

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Days: 0

2.2.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 4000
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

2.2.3 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	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

2.3 Architectural Coatings Phase

2.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2022

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

2.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 4000
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

2.3.3 Architectural Coatings Phase Emission Factor(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.3.4 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

3. Heating

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Heat CBRNE Facility

- Activity Description:
Heat CBRNE facility (4,000 sq ft).

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- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000391
SO_x	0.049742
NO_x	0.023029
CO	0.005757
PM 10	0.001428

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000530
Pb	0.000000
NH_3	0.000000
CO_2e	26.0

3.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 4000
Type of fuel: Fuel Oil No. 2
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/gal): 0.14
Energy Intensity (MMBtu/ft^2): 0.0806

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

3.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000 gal)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.34	43.2	20	5	1.24	0.46			22579

3.4 Heating Formula(s)

- Heating Fuel Consumption gallons per Year
$FC_{HER} = HA * EI / HV / 1000$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBtu/gal)
1000: Conversion Factor

- Heating Emissions per Year
$HE_{POL} = FC * EF_{POL} / 2000$

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project E: Baffle CATM Ranges

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.418		
NOx	2.620		
CO	2.520	100	No
SOx	0.007		
PM 10	20.907		
PM 2.5	0.107		
Pb	0.000		
NH3	0.001		
CO2e	649.8		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project E: Baffle CATM Ranges

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project E: Baffle CATM Ranges

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project E: Baffle CATM Ranges

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction. It was assumed the entire disturbance area would be graded and the baffles would be pre-constructed prior to installation within the outdoor ranges. Therefore, this analysis does not include construction.

Site grading:

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Grade entire project area (4 ac; 174,240 sq ft). Site grading would begin in January 2022 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.417730
SO_x	0.006564
NO_x	2.619653
CO	2.519682
PM 10	20.906880

Pollutant	Total Emissions (TONs)
PM 2.5	0.106844
Pb	0.000000
NH_3	0.000842
CO_2e	649.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 174240
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)

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- 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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project N: Construct Counter IED Identification Training Course

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.903		
NOx	5.582		
CO	5.208	100	No
SOx	0.014		
PM 10	78.227		
PM 2.5	0.227		
Pb	0.000		
NH3	0.002		
CO2e	1418.7		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project N: Construct Counter IED Identification Training Course

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project N: Construct Counter IED Identification Training Course

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project N: Construct Counter IED Identification Training Course

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction. It was assumed the entire disturbance area would be graded and training course components, storage facility, and overhead cover would be pre-constructed prior to installation within the project area. Therefore, this analysis does not include construction.

Site grading:

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Grade entire project area (15 ac; 653,400 sq ft). Site grading would begin in January 2022 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.902813
SO_x	0.014305
NO_x	5.582157
CO	5.207735
PM 10	78.226637

Pollutant	Total Emissions (TONs)
PM 2.5	0.226572
Pb	0.000000
NH_3	0.001516
CO_2e	1418.7

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 653400
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
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0648	0.0013	0.3170	0.5103	0.0136	0.0136	0.0058	119.72
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1723	0.0026	1.1176	0.7579	0.0447	0.0447	0.0155	262.87
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project X: Construct Drainage Improvements at the Assault Course and Obstacle Course

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.346		
NOx	2.039		
CO	2.266	100	No
SOx	0.006		
PM 10	26.083		
PM 2.5	0.083		
Pb	0.000		
NH3	0.001		
CO2e	568.8		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project X: Construct Drainage Improvements at the Assault Course and Obstacle Course

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project X: Construct Drainage Improvements at the Assault Course and Obstacle Course

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project X: Construct Drainage Improvements at the Assault Course and Obstacle Course

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (5 ac; 217,800 sq ft). Site grading will begin in January 2022 and last approximately 6 months.

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Trenching:
Trenching for 5 ac (217, 800 sq ft) of drainage improvements. Trenching will begin in July 2022 and last approximately 6 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.345963
SO_x	0.005866
NO_x	2.039354
CO	2.266310
PM 10	26.083015

Pollutant	Total Emissions (TONs)
PM 2.5	0.082983
Pb	0.000000
NH_3	0.000758
CO_2e	568.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 217800
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 6

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 217800
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384

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LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project AE: Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.om
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.679		
NOx	4.103		
CO	4.019	100	No
SOx	0.011		
PM 10	156.190		
PM 2.5	0.166		
Pb	0.000		
NH3	0.001		
CO2e	1091.2		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project AE: Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project AE: Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project AE: Provide Jacks Valley District-wide Erosion Control and Stormwater Drainage Improvements

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:

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Grade entire project area (30 ac; 1,307,000 sq ft). Site grading will begin in January 2022 and last approximately 6 months.

Trenching:
Trenching for 30 ac (1,307,000 sq ft) of erosion control and stormwater drainage improvements. Trenching will begin in July 2022 and last approximately 6 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.679290
SO_x	0.011097
NO_x	4.102894
CO	4.018590
PM 10	156.190049

Pollutant	Total Emissions (TONs)
PM 2.5	0.166123
Pb	0.000000
NH_3	0.001179
CO_2e	1091.2

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1307000
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

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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

2.1.3 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	0.0648	0.0013	0.3170	0.5103	0.0136	0.0136	0.0058	119.72
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1723	0.0026	1.1176	0.7579	0.0447	0.0447	0.0155	262.87
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

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$PM10_{FD}$: 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 Trenching/Excavating Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2022

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

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1307000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 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	0.0648	0.0013	0.3170	0.5103	0.0136	0.0136	0.0058	119.72
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92

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Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1723	0.0026	1.1176	0.7579	0.0447	0.0447	0.0155	262.87
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project C: Construct North/South Connector Roads

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.310		
NOx	1.933		
CO	1.824	100	No
SOx	0.005		
PM 10	8.405		
PM 2.5	0.079		
Pb	0.000		
NH3	0.001		
CO2e	489.5		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project C: Construct North/South Connector Roads

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project C: Construct North/South Connnector Roads

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project C: Construct North/South Connnector Roads

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (69,750 sq ft) for the unpaved north/south connector roads. Site grading would begin in January 2022 and last approximately 12 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.309648
SO_x	0.004921
NO_x	1.933022
CO	1.823813
PM 10	8.405032

Pollutant	Total Emissions (TONs)
PM 2.5	0.078557
Pb	0.000000
NH_3	0.000674
CO_2e	489.5

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 69750
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project J: Construct CATM Bypass Road

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: CarolynHein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.310		
NOx	1.933		
CO	1.824	100	No
SOx	0.005		
PM 10	6.391		
PM 2.5	0.079		
Pb	0.000		
NH3	0.001		
CO2e	489.5		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project J: Construct CATM Bypass Road

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: CarolynHein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project J: Construct CATM Bypass Road

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project J: Construct CATM Bypass Road

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (52,875 sq ft) for the unpaved CATM bypass road. Site grading would begin in January 2022 and last approximately 12 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.309648
SO_x	0.004921
NO_x	1.933022
CO	1.823813
PM 10	6.390569

Pollutant	Total Emissions (TONs)
PM 2.5	0.078557
Pb	0.000000
NH_3	0.000674
CO_2e	489.5

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 52875
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project K: Construct FERL Parking Lot

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.310		
NOx	1.933		
CO	1.824	100	No
SOx	0.005		
PM 10	3.087		
PM 2.5	0.079		
Pb	0.000		
NH3	0.001		
CO2e	489.5		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project K: Construct FERL Parking Lot

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project K: Construct FERL Parking Lot

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project K: Construct FERL Parking Lot

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (25,200 sq ft) for the unpaved off-road parking area in the FERL training area. Site grading would begin in January 2022 and last approximately 12 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.309648
SO_x	0.004921
NO_x	1.933022
CO	1.823813
PM 10	3.086850

Pollutant	Total Emissions (TONs)
PM 2.5	0.078557
Pb	0.000000
NH_3	0.000674
CO_2e	489.5

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 25200
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project L: Construct FERL Road Improvements

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.418		
NOx	2.620		
CO	2.520	100	No
SOx	0.007		
PM 10	18.747		
PM 2.5	0.107		
Pb	0.000		
NH3	0.001		
CO2e	649.8		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project L: Construct FERL Road Improvements

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project L: Construct FERL Road Improvements

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project L: Construct FERL Road Improvements

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction. It was conservatively assumed the entire disturbance area for road improvements would be graded.

Site grading:
Grade entire project area (156,150 sq ft) for the FERL road improvements. Site grading would begin in January 2022 and last approximately 12 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.417730
SO_x	0.006564
NO_x	2.619653
CO	2.519682
PM 10	18.747376

Pollutant	Total Emissions (TONs)
PM 2.5	0.106844
Pb	0.000000
NH_3	0.000842
CO_2e	649.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 156150
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 (%)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project O: Return Roads to Natural Condition

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.310		
NOx	1.933		
CO	1.824	100	No
SOx	0.005		
PM 10	5.799		
PM 2.5	0.079		
Pb	0.000		
NH3	0.001		
CO2e	489.5		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project O: Return Roads to Natural Condition

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project O: Return Unused Roads to Natural Condition

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project O: Return Unused Roads to Natural Condition

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (47,916 sq ft) for existing dirt road disturbance and topsoil mixing. Site grading would begin in January 2022 and last approximately 12 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.309648
SO_x	0.004921
NO_x	1.933022
CO	1.823813
PM 10	5.798586

Pollutant	Total Emissions (TONs)
PM 2.5	0.078557
Pb	0.000000
NH_3	0.000674
CO_2e	489.5

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 47916
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project S: Improve the Existing BCT Parking Lot

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See section 2 in the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.310		
NOx	1.933		
CO	1.824	100	No
SOx	0.005		
PM 10	7.277		
PM 2.5	0.079		
Pb	0.000		
NH3	0.001		
CO2e	489.5		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project S: Improve the Existing BCT Parking Lot

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 in the EA.

- Action Description:
See section 2 in the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: CarolynHein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project S: Improve the Existing BCT Parking Lot

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project S: Improve the Existing BCT Parking Lot

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (60,300 sq ft), which will include grading and levelling the existing unpaved BCT parking lot. Site grading would begin in January 2022 and last approximately 12 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.309648
SO_x	0.004921
NO_x	1.933022
CO	1.823813
PM 10	7.276933

Pollutant	Total Emissions (TONs)
PM 2.5	0.078557
Pb	0.000000
NH_3	0.000674
CO_2e	489.5

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 60300
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project AG: Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.418		
NOx	2.620		
CO	2.520	100	No
SOx	0.007		
PM 10	29.473		
PM 2.5	0.107		
Pb	0.000		
NH3	0.001		
CO2e	649.8		

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project AG: Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project AG: Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project AG: Construct Running/Walking/Biking Trail Along Academy Drive and North Gate Boulevard

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Grade entire project area (5.65 ac; 246,000 sq ft) for the running/walking/biking trail. Site grading would begin in January 2022 and last approximately 12 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.417730
SO_x	0.006564
NO_x	2.619653
CO	2.519682
PM 10	29.473271

Pollutant	Total Emissions (TONs)
PM 2.5	0.106844
Pb	0.000000
NH_3	0.000842
CO_2e	649.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

- Phase Duration
Number of Month: 12
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 246000
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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform 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: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

b. Action Title: Project AH: Loop the Jacks Valley District Water Supply Line

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2022

e. Action Description:

See Section 2 of the EA.

f. Point of Contact:
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.346		
NOx	2.039		
CO	2.266	100	No
SOx	0.006		
PM 10	32.505		
PM 2.5	0.083		
Pb	0.000		
NH3	0.001		
CO2e	568.8		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2023 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Colorado Springs, CO			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Carolyn Hein, Contractor

5/26/2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: USAF ACADEMY
State: Colorado
County(s): El Paso
Regulatory Area(s): Colorado Springs, CO

- Action Title: Project AH: Loop the Jacks Valley District Water Supply Line

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:
See Section 1.8 of the EA.

- Action Description:
See Section 2 of the EA.

- Point of Contact
Name: Carolyn Hein
Title: Contractor
Organization: HDR
Email: Carolyn.Hein@hdrinc.com
Phone Number: (484) 612-1060

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Project AH: Loop the Jacks Valley District Water Supply Line

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: El Paso
Regulatory Area(s): Colorado Springs, CO

- Activity Title: Project AH: Loop the Jacks Valley District Water Supply Line

- Activity Description:
For the purposes of this analysis, a 1-year construction period was assumed and calendar year 2022 was used as a surrogate to determine total air emissions from construction.

Site grading:
Grade entire project area (6.2 ac; 271,600 sq ft). Site grading will begin in January 2022 and last approximately 6 months.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Trenching:
Trenching of 6.2 ac (271,600 sq ft) for water supply lines. Trenching will begin in July 2022 and last approximately 6 months.

- Activity Start Date
Start Month: 1
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.345963
SO_x	0.005866
NO_x	2.039354
CO	2.266310
PM 10	32.505421

Pollutant	Total Emissions (TONs)
PM 2.5	0.082983
Pb	0.000000
NH_3	0.000758
CO_2e	568.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2022

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

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 271600
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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

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)

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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 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2022

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

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2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 271600
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 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	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

- 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	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507

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HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
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HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

2.2.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

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