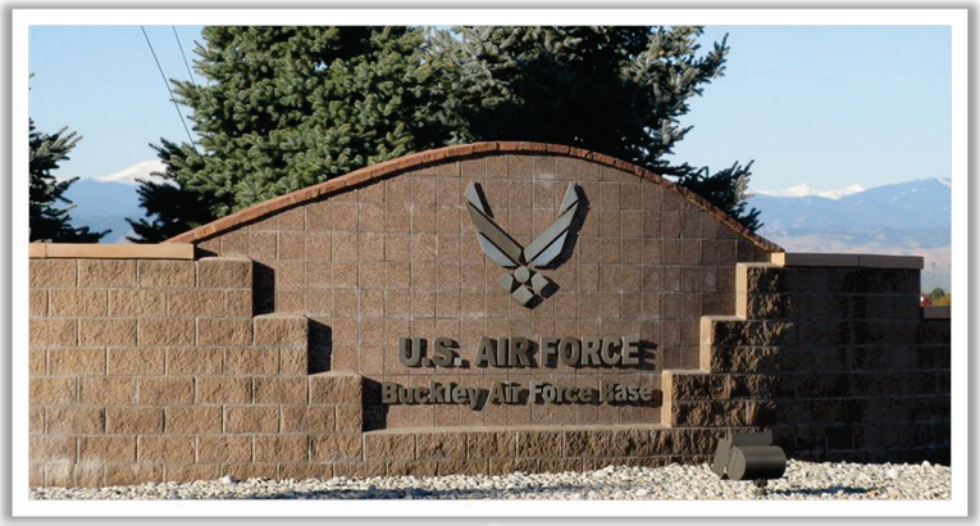
ENVIRONMENTAL ASSESSMENT, PROJECT MOUNTAINVIEW FACILITY, BUCKLEY AIR FORCE BASE, COLORADO



OCTOBER 2011

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
AND
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

ENVIRONMENTAL ASSESSMENT, PROJECT MOUNTAINVIEW FACILITY, BUCKLEY AIR FORCE BASE, COLORADO

INTRODUCTION

Buckley Air Force Base (BAFB) occupies a 3,897-acre parcel of flat to rolling uplands in the eastern portion of the metropolitan Denver, Colorado, area. The installation is approximately 3 miles east of Interstate 225 and 10 miles southwest of the Denver International Airport. BAFB is on the eastern edge of urbanized portions of the City of Aurora in Arapahoe County, Colorado. The U.S. Air Force (USAF) 460th Space Wing (460th SW) is the host unit at BAFB and is directed by the Air Force Space Command. The mission of the 460th SW is to provide combatant commanders with expeditionary warrior airmen and deliver global infrared surveillance, tracking and missile warning for theater and homeland defense. Approximately 12,000 active-duty, reserve, civilian, and contractor personnel are assigned to BAFB.

BAFB is also home to the National Security Agency (NSA)-Colorado (NSAC) facility, formerly the Denver Security Operations Center. The NSAC facility was established within the Aerospace Data Facility-Colorado (ADF-C) compound of BAFB in 2005. The current facilities for the NSAC are one-story, wooden, modular structures that total approximately 50,000 square-feet (ft^2). The modular structures were designed for temporary use and are severely undersized.

The NSA proposes to replace the existing modular structures of the NSAC facility with a permanent replacement facility. The proposed facility will be known as the MOUNTAINVIEW facility and will be constructed within or in the vicinity of BAFB, Colorado. Demolition of the existing NSAC facility will occur following the construction of the MOUNTAINVIEW facility.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to provide a replacement facility for the NSAC facility that is capable of supporting the current and anticipated mission needs of the NSA. The proposed project is a modernization project to provide the necessary infrastructure required for current ongoing missions rather than an expansion project involving new mission activities. No new mission, organization, or operation is planned.

The Proposed Action is needed because the NSAC facility is currently operating from outdated modular structures that do not have sufficient space and infrastructure capabilities to meet current and future mission requirements, particularly with respect to information technology and power infrastructure. The modular structures have water, heat, electricity and communications, but were designed for temporary use and are severely undersized.

The operations of the proposed new facility must be readily accessible to the existing operations at the ADF-C. While a certain amount of non-contiguous capacity is inevitable, the existing operations require constant, frequent collaboration and communication on a near real-time basis. Consequently, any site that prevents the immediate, rapid interface of NSA personnel with other ADF-C personnel does not meet the mission support criterion.

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action includes three components: construction activities, demolition activities and facility operations. Each component is discussed in the following subsections.

Construction Activities. Construction activities for the proposed MOUNTAINVIEW facility will include constructing an operations building, chiller plant, power plant, four 20,000-gallon capacity aboveground storage tanks (ASTs) to contain an operational capacity of 60,000 gallons of diesel fuel, 610-vehicle employee parking lot, temporary contractor parking area, access drives, walkways, utilities, outdoor lighting and storm water management

infrastructure. The facility will accommodate low-impact development design techniques where practicable. Details regarding the construction of the proposed facility are provided in the following paragraphs.

The operations building will measure approximately 201,000 ft^2 (140,000-ft^2 footprint) and contain administrative and operations spaces, computer labs, office space, a conference room, a tiered auditorium, a loading dock and a cafeteria. The building will be designed with two aboveground floors and a basement and will be no taller than Building D within the ADF-C.

The chiller plant will measure approximately 5,000 ft^2 and contain four, electrically driven chillers. It will include an office, control room, restroom, electrical equipment, chillers, pumps and cooling towers. The chillers will provide chilled water to cool equipment and the interior of the operations building. The chillers will use a refrigerant with no Class I or Class II ozone-depleting substances.

A new three-phase electrical feeder will be constructed in coordination with Xcel Energy to provide primary electrical power to the proposed facility. The electrical feeder will be sized for 18.5 megawatts (MW) and the electrical demand from the entire facility is expected to be 6.45 MW. A new pad-mounted switch will be constructed to interface between the new utility feed and the proposed facility. The public utility, Xcel Energy, identified a potential electric feeder line route for that portion of the line outside of BAFB. Based on the proposed route, Excel Energy will use directional boring at Sand Creek if crossing is necessary. Based on the proposed route and design, there will be no significant environmental impacts from installation or use of the proposed electrical feeder line. If another route or design results in a significant change, then the USAF will undertake appropriate additional environmental impact analysis pursuant to USAF National Environmental Policy Act (NEPA) regulations.

The standby, backup, electric power plant will measure approximately 19,000 ft^2 and contain up to 10 2.5-MW, diesel-powered, electrical generators and one low-wattage, diesel-powered, emergency generator (life safety generator). The 2.5-MW generators will be used for a combined total of up to 3,700 hours per year for operations and maintenance purposes and nonemergency operational conditions (i.e., loss of power or potential loss of power based on local meteorological conditions). The low-wattage emergency generator will provide a short-term supply of electricity in an emergency situation. Mufflers will be installed on the generators to reduce noise.

Four 20,000-gallon capacity ASTs (number and size of storage tanks could vary) will be constructed to provide storage provisions for a 3-day supply of diesel fuel oil number 2 for the generators. The double-walled, steel ASTs would be installed on a concrete pad.

An employee parking lot with approximately 610 parking spaces will be constructed for the proposed facility within the ADF-C security fence line, which will be adequate for up to 850 people across three shifts. It is estimated that the employee parking lot and all associated access roadways will have a footprint of approximately 130,000 ft^2.

Appropriate pavements, access drives, sidewalks, curbs, gutters, storm water drainage, lighting and landscaping will be part of the construction at the proposed facility. The Proposed Action will accommodate existing drainage patterns. Storm water will be managed to meet the requirements of BAFB's Municipal Separate Storm Sewer System permit; Energy Independence and Security Act Section 438; and Federal, state and local requirements. Appropriate and adequate storm water management infrastructure will be designed, permitted and constructed as necessary. The on-base and off-base permits for the proposed storm water management infrastructure will be acquired by BAFB and Excel Energy respectively.

Natural gas will be used as the primary fuel source to heat the proposed MOUNTAINVIEW facility. The three buildings of the proposed facility will be designed to be expandable and to achieve an energy efficiency rating of Leadership in Energy and Environmental Design (LEED) Silver at a minimum and will target a rating of LEED Gold.

A drainage ditch (approximately 8,077 ft^2) and an isolated, nonjurisdictional wetland area (220 ft^2) have been identified within the footprint of the proposed MOUNTAINVIEW facility. While the wetland does meet the definition of a wetland per Executive Order (EO) 11990, it appears that the hydrology, soils and vegetation are present due to lack of maintenance of a man-made drainage feature and outfall. Furthermore, wetland values such as wildlife habitat value, storm water buffering capacity, and groundwater recharge at the wetland are extremely low. The wetland cannot be avoided and will be eliminated during the construction of the proposed facility. Avoidance is not possible due to the requirement of having the new project location operationally connected to the existing

structures; anti-terrorism/force protection and future antenna construction areas preclude building in different areas of the site. The required size of the facility, limited by elevation, drives a layout requirement that requires the elimination of the drainage ditch and nonjurisdictional wetland area. Because of the low value of this wetland, instead of offsetting the loss of this wetland through traditional enhancement of wetlands elsewhere, a contribution to overall wetlands conservation on BAFB will be performed via contributing some bio-engineering materials for small-scale stabilization efforts along East Toll Gate Creek or in the area of the Proposed Action to meet the spirit and intent of EO 11990. The NSA will coordinate with BAFB in the selection of the wetlands conservation contribution and fund the associated activities.

Demolition Activities. The area of the proposed MOUNTAINVIEW facility is primarily undeveloped, but contains an approximately 1.3-acre gravel parking lot. The existing gravel parking lot and 18 parking spots from the asphalt parking lot east of Building D will be removed to accommodate the proposed operations building. Sufficient parking is available outside of the ADF-C fence line to compensate for the demolition of the gravel parking lot and a portion of the asphalt parking lot during construction.

Demolition activities will also entail removing the existing NSAC facility at BAFB. The NSAC facility was constructed in 2005 and is composed of approximately 54 one-story, wooden trailers. The modular structures are arranged in a manner that forms two buildings. Collectively, the modular structures measure approximately 50,000 ft^2; therefore, total ground disturbance from demolition activities outside of the construction footprint will be slightly greater than 1 acre. The demolition of the modular structures will occur sometime after the construction of the proposed MOUNTAINVIEW facility, after the first quarter of FY 2016. The demolition contractor will recycle the NSAC facility modular structures to the greatest extent possible.

Facility Operations. Construction and demolition activities will occur in a phased approach to allow continuous, uninterrupted operation of the NSAC facility and maintenance of anti-terrorism/force protection requirements. The proposed MOUNTAINVIEW facility will house up to 850 personnel. Most of these individuals will transfer from the existing NSAC facility; however, there will be a net gain of approximately 100 personnel over the 10-year period subsequent to construction to support current ongoing missions. As is currently done, personnel will be spread across three shifts. The ADF-C will be responsible for managing and maintaining the proposed MOUNTAINVIEW facility.

NO ACTION ALTERNATIVE

Under the No Action Alternative, NSA will not implement the Proposed Action. Without implementing the Proposed Action, the existing NSAC facility would remain in service and no new facility would be constructed. Personnel at the NSAC facility would continue to use outdated and undersized facilities that do not have sufficient space and infrastructure capabilities to meet current and future mission requirements. Other location options were initially examined in the EA. These options included construction at an off-base location and construction at an on-base location, but not carried forward as they did not meet selection standards.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED ACTION

Based on the analyses accomplished as a part of the Environmental Assessment (EA), which is herewith incorporated by reference, it is determined that no significant adverse effects will be expected on any resource area as a result of the Proposed Action. NSA will adhere to all installation management plans, policies and procedures. Insignificant, adverse effects on noise, air quality, geological resources, water resources, biological resources, infrastructure and hazardous materials and waste will be expected as a result of the construction and demolition activities. The effects associated with the construction and demolition activities will primarily be localized to the immediate area of construction and demolition and will subside following the end of construction and demolition in that area. An insignificant, adverse impact on wetlands will be expected due to unavoidable construction in a 220-ft^2, isolated, nonjurisdictional wetland area. All necessary permits and waivers will be acquired prior to commencement of construction and demolition activities. Insignificant, adverse effects on noise, air quality, water resources, infrastructure and hazardous materials and waste will be expected as a result of operating the proposed facility. Insignificant, beneficial effects on socioeconomics will be expected due to the implementation of the Proposed Action.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

Public review of the Draft EA and Draft FONSI/FONPA was conducted from July 7, 2011, through August 5, 2011. All response letters are incorporated as appropriate into the EA.

FINDING OF NO PRACTICABLE ALTERNATIVE

Considering the information contained herein (including the attached EA), in accordance with, and pursuant to the authority delegated by the Secretary of the Air Force Order 791.1, I find that there is no practicable alternative to construction of the proposed MOUNTAINVIEW facility in a wetland. The impact of the Proposed Action will not be significant and the selected action includes all practicable measures to minimize harm to wetlands. If there are significant changes to the proposed route, design and installation of the off-base portion of the proposed electric feeder line, then appropriate environmental impact analysis pursuant to NEPA will be conducted along with appropriate supplemental documentation.

FINDING OF NO SIGNIFICANT IMPACT

After a review of the EA prepared in accordance with the requirements of the NEPA, the Council on Environmental Quality regulations, the USAF's Environmental Impact Analysis Process, 32 Code of Federal Regulations Part 989, as amended, and receipt of public comments on the document. I have determined that the Proposed Action will not have a significant impact on the quality of the human or natural environment and, therefore, an Environmental Impact Statement does not need to be prepared. This decision has been made after taking into account all submitted information and considering a full range of practical alternatives that will meet project requirements and that are within the legal authority of USAF.

Jeffrey C Allen — 16 Dec 11

JEFFREY C. ALLEN — DATE
SES, DAF
Director of Logistics, Installations
and Mission Support

ABBREVIATIONS AND ACRONYMS

µg/m^3	micrograms per cubic meter
460th CES/CEAN	460th Civil Engineer Squadron/Environmental Element
460th SW	460th Space Wing
ABI	asbestos building inspector
ACM	asbestos-containing material
ADF-C	Aerospace Data Facility-Colorado
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AHPA	Archeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
AOC	Area of Concern
APE	Area of Potential Effect
APEN	Air Pollutant Emission Notice
APZ	accident potential zone
AQCR	air quality control region
ARPA	Archaeological Resources Protection Act
AST	Aboveground Storage Tank
AT/FP	Anti-terrorism/Force Protection
bgs	below ground surface
BMP	best management practice
CAA	Clean Air Act
CCR	Code of Colorado Regulation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
dBA	A-weighted decibel
DIA	Denver International Airport
DNL	day-night average sound level
DOD	Department of Defense
DSOC	Denver Security Operations Center
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
ELG	Effluent Limitations Guidelines
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ETL	Engineering Technical Letter
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FR	Federal Register
ft^2	square feet
FY	fiscal year
GHG	greenhouse gases
gpd	gallons per day
gpm	gallons per minute
HAP	hazardous air pollutant
HAZMART	hazardous materials pharmacy
HUD	U.S. Department of Housing and Urban Development
I	Interstate
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
LBP	lead-based paint
LEED	Leadership in Energy and Environmental Design
LID	low-impact development
LRT	Light Rail Transit
mcf	million cubic feet
mcf/month	million cubic feet per month
MDI	Metropolitan Denver Interstate
mg/m^3	milligrams per cubic meter

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mgd	million gallons per day
MMRP	Military Munitions Response Program
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
MSGP	Multi-Sector General Permit
MSL	mean sea level
MW	megawatt
MWh/month	megawatt hours per month
MWRD	Metro Wastewater Reclamation District
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NANSR	Nonattainment New Source Review
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMOC	non-methane organic compound
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	National Security Agency
NSAC	National Security Agency-Colorado
NSPS	New Source Performance Standards
ntu	nephelometric turbidity units
O_3	ozone
OSHA	Occupational Safety and Health Administration
P2	Pollution Prevention
Pb	lead
PCB	polychlorinated biphenyl
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
POL	petroleum, oil, and lubricant
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
RTD	Regional Transportation District
RTF	Remote Terminal Facility
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SOP	Standard Operating Procedures
SO_x	sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasures
SSPP	Strategic Sustainability Performance Plan
SWA	State Wildlife Act
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TCP	traditional cultural properties
TMDL	Total Maximum Daily Load
tpy	tons per year
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
UDFCD	Urban Drainage and Flood Control District
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
VOC	volatile organic compound

COVER SHEET

ENVIRONMENTAL ASSESSMENT, PROJECT MOUNTAINVIEW FACILITY, BUCKLEY AIR FORCE BASE, COLORADO

Responsible Agency: National Security Agency (NSA).

Coordinating Agencies: 460th Space Wing and Air Force Space Command.

Affected Location: Buckley Air Force Base (AFB), Arapahoe County, Colorado.

Report Designation: Environmental Assessment (EA).

Proposed Action: The NSA proposes to construct and operate the MOUNTAINVIEW facility within or in the vicinity of Buckley AFB, Colorado. The MOUNTAINVIEW facility would replace the existing NSA-Colorado (NSAC) facility, formerly the Denver Security Operations Center, at Buckley AFB, which would be subsequently demolished.

Abstract: This EA addresses the proposed replacement of the NSAC facility at Buckley AFB, Colorado. The Proposed Action is needed because the NSAC facility is currently operating from outdated modular structures that do not have sufficient space and infrastructure capabilities to meet current and future mission requirements, particularly with respect to information technology and power infrastructure. The Proposed Action includes construction and operation of the proposed MOUNTAINVIEW facility within the Aerospace Data Facility-Colorado (ADF-C) compound at Buckley AFB followed by demolition of the existing 50,000-square-foot (ft^2) NSAC facility. The proposed MOUNTAINVIEW facility would be immediately north and northwest of the existing NSAC facility and would include an approximately 201,000-ft^2 operations building, 5,000-ft^2 chiller plant, 19,000-ft^2 power plant, four 20,000-gallon capacity aboveground storage tanks (number and size could vary) to contain an operational capacity of 60,000 gallons of diesel fuel, and a 610-vehicle employee parking lot (adequate for three shifts). The proposed operations building would have two aboveground floors and a basement and house up to 850 personnel, 100 of which would be new hires over the subsequent 10-year period following facility construction. The equipment within the chiller plant would provide chilled water for cooling equipment and the facility buildings. The power plant would contain up to 10 2.5-megawatt (MW), diesel-driven, electrical generators and one low-wattage, diesel-driven, emergency generator (life safety generator) for emergencies. A three-phase 18.5 MW electric feeder line from the local public utility provider would be installed to provide a reliable power source to the proposed MOUNTAINVIEW facility. All three buildings of the proposed facility would be designed to be expandable and achieve an energy efficiency rating of Leadership in Energy and Environmental Design (LEED) Silver at a minimum and would target a rating of LEED Gold. If approved, the site preparation, construction, and build-out of the Proposed Action would occur between the second quarter of fiscal year (FY) 2012 and the first quarter of FY 2016. The demolition of the existing NSAC facility would occur sometime after the first quarter of FY 2016. An approximately 1-acre, temporary, gravel contractor personal vehicle parking area would be constructed to support the proposed construction and demolition activities. Following the completion of the proposed construction and demolition activities, the temporary contractor parking area would be returned to natural preconstruction conditions.

This EA analyzes and documents potential environmental consequences associated with the Proposed Action and the No Action Alternative. The EA examines potential effects of the Proposed Action and the No Action Alternative on 10 resource areas: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, transportation and infrastructure, and hazardous materials and waste. If the analyses presented in the EA

indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, then a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents the reasons why a proposed action would not have a significant effect on the human environment and why an Environmental Impact Statement (EIS) would not be necessary. In addition, this Proposed Action would impact a 220-ft^2, isolated, nonjurisdictional wetland. If there is no practicable alternative to impacting this wetland then a Finding of No Practicable Alternative (FONPA) would be issued. If significant environmental issues would result from the Proposed Action that cannot be mitigated to insignificance, a Notice of Intent to prepare an EIS would be required, or no action would be taken.

For additional information, please call the project point-of-contact Mr. Jeffrey Williams at 301-688-2970.

ENVIRONMENTAL ASSESSMENT, PROJECT MOUNTAINVIEW FACILITY, BUCKLEY AIR FORCE BASE, COLORADO

NATIONAL SECURITY AGENCY
FORT MEADE, MARYLAND 27055

OCTOBER 2011

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ENVIRONMENTAL ASSESSMENT, PROJECT MOUNTAINVIEW FACILITY, BUCKLEY AIR FORCE BASE, COLORADO

TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1. Purpose of and Need for the Proposed Action

1.1 Background

Buckley Air Force Base (AFB) occupies a 3,897-acre parcel of flat to rolling uplands in the eastern portion of the metropolitan Denver, Colorado, area. The installation is approximately 3 miles east of Interstate- (I) 225 and 10 miles southwest of the Denver International Airport (DIA). Buckley AFB is on the eastern edge of urbanized portions of the City of Aurora in Arapahoe County, Colorado (see **Figure 1-1**). The 460th Space Wing (460th SW) is the host unit at Buckley AFB and is directed by Air Force Space Command. The mission of the 460th SW is to deliver global infrared surveillance, tracking, and missile warning for theater and homeland defense and provide combatant commanders with expeditionary warrior airmen. Approximately 13,000 active-duty, reserve, civilian, and contractor personnel and military dependents work or live at Buckley AFB (Spann 2011).

Buckley AFB is also home to the National Security Agency-Colorado (NSAC), formerly known as the National Security Agency (NSA) Denver Security Operations Center (DSOC). The NSAC facility was established within the Aerospace Data Facility-Colorado (ADF-C) compound of Buckley AFB in 2005. The current facilities for the NSAC facility are one-story, wooden, modular structures that total approximately 50,000 square feet (ft^2). The modular structures were designed for temporary use and are severely undersized.

This Environmental Assessment (EA) addresses the NSA proposal for the replacement of the existing, inadequate, temporary NSAC facility at Buckley AFB, Colorado. This EA assesses the Proposed Action and the No Action Alternative. If the analyses presented in the EA indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, then a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents the reasons why a proposed action would not have a significant effect on the human environment and why an Environmental Impact Statement (EIS) would not be necessary. In addition, the Proposed Action would impact a 220-ft^2, isolated, nonjurisdictional wetland. If there is no practicable alternative to impacting the wetland then a Finding of No Practicable Alternative (FONPA) would be issued. If significant environmental issues would result from the Proposed Action that cannot be mitigated to insignificance, a Notice of Intent to prepare an EIS would be required or no action would be taken.

This EA does not constitute approval to conduct the activities associated with the Proposed Action. Any construction and demolition associated with the Proposed Action presented in this EA must be presented to the 460th SW Facility Board at Buckley AFB for review, approval, and project-specific siting.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide a replacement facility for the NSAC facility that is capable of supporting the current and anticipated mission needs of the NSA. The proposed project is a modernization project to provide the necessary infrastructure required for current, ongoing missions rather than an expansion project involving new mission activities. No new mission, organization, or operation is planned.

The Proposed Action is needed because the NSAC facility is currently operating from outdated modular structures that do not have sufficient space and infrastructure capabilities to meet current and future mission requirements, particularly with respect to information technology and power infrastructure. The modular structures have water, heat, electricity, and communications, but were designed for temporary use and are severely undersized.

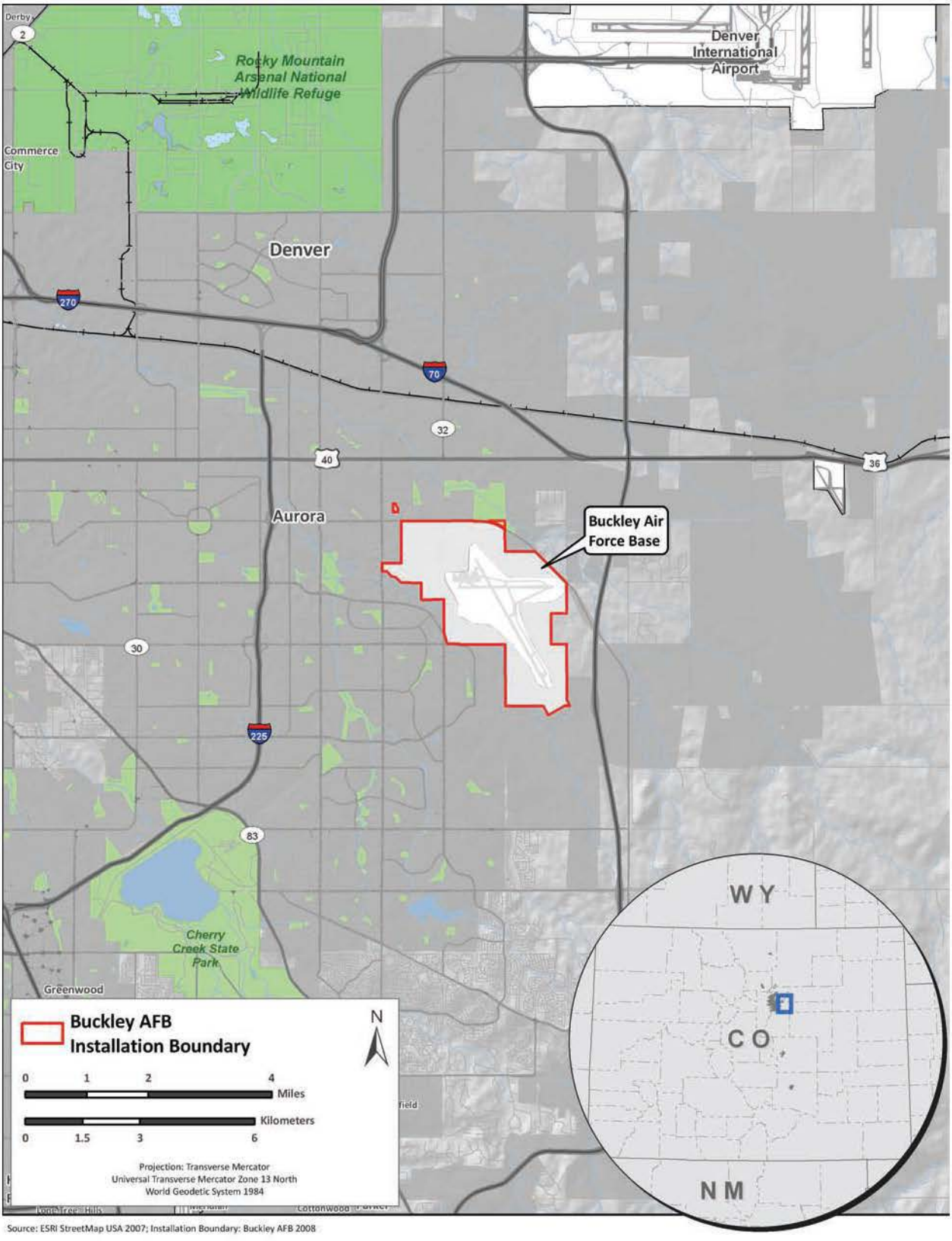

Figure 1-1. Location of Buckley Air Force Base, Colorado

1.3 Relevant Plans, Laws, Regulations, and Other Documents

1.3.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 is a Federal statute requiring the identification and analysis of potential environmental impacts of proposed Federal actions before those actions are taken. NEPA established the Council on Environmental Quality (CEQ) that is charged with the development of implementing regulations and ensuring agency compliance with NEPA. CEQ regulations mandate that all Federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that might affect the environment. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decisions.

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

Air Force Policy Directive 32-70, *Environmental Quality*, states that the U.S. Air Force (USAF) will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*, which incorporates 32 CFR Part 989, as amended. The NSA's implementation procedure for NEPA is *National Environmental Policy Act Procedures (Draft)* (NSA undated).

1.3.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations (see **Appendix A**). It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively" (40 CFR 1500.2a).

Department of Defense (DOD) Instruction 4715.9, *Environmental Planning and Analysis*, implements policy and assigns responsibilities for integration of environmental considerations into DOD actions and supplements the requirements of NEPA. Various permits would also be required for the proposed construction and demolition activities. Anticipated permit requirements are described briefly as follows.

Water-Related Permits. In accordance with the National Pollutant Discharge Elimination System (NPDES), the Proposed Action would require coverage under the U.S. Environmental Protection Agency (USEPA) *Construction General Permit* (CGP) for storm water discharges associated with on-base construction activities because there would be greater than 1 acre of ground disturbance. A site-specific Storm Water Pollution Prevention Plan (SWPPP), including sediment- and erosion-control measures, would be developed and implemented for the on-base construction activities.

The discharge of storm water runoff from the proposed off-base construction activities would require coverage under the Colorado Department of Public Health and Environment (CDPHE) *General Permit for Stormwater Discharges Associated with Construction Activity (COR-030000)* and the City of Aurora's *Stormwater Quality Discharge Permit for Construction Activities*. The CDPHE permit requires the development and implementation of a Storm Water Management Plan (SWMP).

In addition to storm water controls required under the CGP, Section 438 of the Energy Independence and Security Act (EISA) (42 United States Code [U.S.C.] 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 ft^2 of land, such as the Proposed Action. EISA Section 438 requirements are independent of storm water requirements under the Clean Water Act (CWA). Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow.

Storage Tank Permits. The Proposed Action would require a permit to be issued by the Colorado Department of Labor and Employment, Division of Oil and Public Safety prior to the construction of the proposed liquid fuel aboveground storage tanks (ASTs).

Air Quality Permits. The Proposed Action would require New Source Review under the Clean Air Act (CAA) due to the new stationary emissions sources that are proposed. The CDPHE Air Pollution Control Division administers the Air Emissions Permit program. All sources of air emissions in Colorado are required to obtain a Construction Permit unless they are specifically exempted by the provisions of Regulation No. 3. The Construction Permit Unit, within the Stationary Sources Program of the CDPHE, issues construction permits to commercial and industrial air pollution sources in Colorado in order to ensure compliance with air quality regulations. The permitting process and requirements involve reporting air emissions through the submission of an Air Pollutant Emission Notice (APEN). Additionally, stationary sources with air emissions exceeding certain thresholds or subject to certain Federal emissions standards require issuance of an air permit (i.e., Construction Permit). The CDPHE must issue the Construction Permit prior to any new construction (CDPHE undated). The initial application for the Construction Permit and APEN could require substantial time for approval. The responsible agencies would need to apply well in advance of planned construction.

The Proposed Action would require a Construction Permit and APEN. The proposed generators would be subject to New Source Performance Standards (NSPS), which trigger the CDPHE requirement to obtain an air quality Construction Permit. In addition, these generators could be subject to Nonattainment New Source Review (NANSR). However, federally enforceable permit limits would be requested under the Construction Permit and emissions controls (i.e., selective catalytic reduction) would be installed to avoid triggering the NANSR permit process. These limits and controls would also be needed to avoid triggering the Prevention of Significant Deterioration (PSD) permit review process because Buckley AFB is a PSD major source per their current operating permit.

1.4 Decision to be Made

The NSA will decide whether to construct the facilities as proposed under the Proposed Action or to select the No Action Alternative, as approved by the 460th SW Facilities Board. The USAF must decide whether to permit the use of Buckley AFB for the proposed MOUNTAINVIEW facility.

1.5 Scope of the Environmental Assessment

This EA evaluates the NSA proposal to construct and operate the proposed MOUNTAINVIEW facility (i.e., operations building, power plant, chiller plant, and associated infrastructure) within or in the vicinity

of Buckley AFB, Colorado, and to remove the existing NSAC facility modular structures. The geographic scope of the EA is the proposed project locations and the local or regional environment potentially impacted by construction, demolition, and operation activities associated with the Proposed Action. The timeframe considered by the EA includes the construction phase and occupancy for 15 years.

1.5.1 History of the Planning and Scoping Process

In 2004, an EA was prepared addressing the existing NSAC facility, then known as the DSOC, at Buckley AFB (BAFB 2004a). That EA evaluated the construction of 50,000 ft^2 of temporary modular offices within the ADF-C compound, construction of a permanent facility of approximately 180,000 ft^2 within the ADF-C compound, and the addition of approximately 350 military and civilian personnel. After evaluating existing infrastructure, communications, access to data, availability of scientific and technical expertise, and technical training capabilities and facilities, a location at or near the ADF-C was identified as the preferred location. A FONSI was signed on September 7, 2004. The temporary modular offices were constructed but not the 180,000-ft^2 permanent facility. Two years later, the name of the operation was changed from the DSOC to the NSAC.

As a result of new mission requirements not evaluated in the 2004 DSOC EA, a new EA was prepared in 2008 on the proposed construction and operation of a multiagency Consolidated Facility within the ADF-C compound (BAFB 2008a). That EA evaluated impacts of a new operations building with up to 635,000 ft^2 of space, a new parking structure for approximately 2,000 vehicles and replacement surface parking, utilities upgrades for the new building, and other infrastructure improvements such as landscaping and sidewalks for the new facilities. A FONSI was proposed on the action but not signed due to changed mission requirements and restrictions imposed by Buckley AFB.

In 2009, a new EA was prepared on the proposed "build to suit" contract to construct 351,000 ft^2 of administrative office space, related facilities, and associated infrastructure (BAFB 2009a). The new facility was proposed to be constructed on up to 70 acres of land in Gateway Park IV East, approximately 2 miles north of Buckley AFB. A FONSI was signed on August 24, 2009; however, the facility was never constructed. This property is considered but not fully analyzed as an alternative for the Proposed Action (see **Section 2.3**).

1.5.2 Resource Topics Studied in Detail

This EA examines potential effects of the Proposed Action and No Action Alternative on 10 resource areas: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, transportation and infrastructure, and hazardous materials and waste. These resources were identified as being potentially affected by the Proposed Action and include applicable critical elements of the human environment, a review of which is mandated by Executive Order (EO), regulation, or policy. **Appendix A** contains examples of relevant Federal laws, regulations, and other requirements that are often considered part of the analysis.

1.5.3 Resource Topics Eliminated from Detailed Analysis

Some environmental resources and conditions that are often analyzed in an EA have been eliminated from analysis or review in this EA (40 CFR 1500.4(c)). The following paragraphs identify these resource areas and the basis for such exclusions.

Airspace. The Proposed Action would not involve any change in current flying missions at Buckley AFB or any of the associated airspace. Building heights would be restricted by the height of existing adjacent

buildings. As no impacts on airspace would be expected as a result of implementing the Proposed Action, airspace was eliminated from detailed analysis in this EA.

Floodplains. EO 11988, *Floodplain Management*, directs Federal agencies to avoid adverse effects and incompatible development in floodplains. The objective of the EO is to avoid, to the extent possible, the short- and long-term, adverse impacts associated with occupancy and modification of floodplains. The EO applies to all Federal agencies conducting activities and programs that might potentially affect floodplains. To comply with EO 11988, agencies must evaluate the impacts of specific proposals on the floodplain before taking any action. The Proposed Action is not in a floodplain. Any potential indirect effects on floodplains would be addressed through the use of storm water best management practices (BMPs), which are required for compliance with EISA Section 438 and the storm water CGP. Therefore, no direct or indirect effects on floodplains would be expected and this issue was not carried forward for detailed analysis.

Radio Frequency Radiation. The Proposed Action would not involve expanded or new radio frequency radiation sources. Therefore, issues involving potential impacts from radio frequency radiation sources have been eliminated from detailed analysis in this EA.

Occupational Health and Safety. Implementation of the Proposed Action would involve routine construction and no special safety concerns have been identified. All contractors performing construction activities are responsible for routinely following ground safety and Occupational Safety and Health Administration regulations and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and use and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplaces; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work. As no special concerns involving occupational health and safety have been identified, this issue has been eliminated from detailed analysis in this EA.

Radon. Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. Radon gas is naturally occurring in soils throughout Colorado. Because the Proposed Action would include a subterranean level, all inhabitable space placed below grade would be monitored and radon and mitigation equipment installed, as necessary. Newly constructed buildings would use design and engineering concepts to reduce these effects. Therefore, no major effects from radon would be expected and it has been dismissed from detailed evaluation in this EA.

1.5.4 Interagency and Intergovernmental Coordination for Environmental Planning, Native American Tribal Consultation, and Public Involvement

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. AFI 32-7060, *Interagency and Intergovernmental*

Coordination for Environmental Planning, requires the USAF to implement the IICEP process, which is used for the purpose of agency coordination and implements scoping requirements.

Through the IICEP process, the NSA notified relevant Federal, state, and local agencies of the Proposed Action and alternatives and provided them sufficient time to make known their environmental concerns specific to the action. The IICEP process also provided the NSA the opportunity to cooperate with and consider state and local views in implementing the Federal proposal. **Appendix B** includes all IICEP materials.

Native American Tribal Consultation. EO 13175, *Consultation and Coordination with Indian Tribal Governments* (6 November 2000), directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands. To comply with legal mandates, federally recognized tribes that are affiliated historically within the Buckley AFB geographic region are invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. Because many tribes were displaced from their original homelands during the historical period, tribes with cultural roots in an area might not currently reside in the region where the undertaking is to occur. Effective consultation requires identification of tribes based on ethnographic and historical data and not simply a tribe's proximity to a project area. The tribal consultation process is distinct from NEPA consultation or the IICEP process and requires separate notification of all relevant tribes by the NSA. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The Buckley AFB Cultural Resources Manager serves as the point-of-contact with Native American tribes, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation.

A letter requesting consultation was sent to each potentially affected tribe describing the Proposed Action and requesting the identification of any concerns that they might have. The goal of the tribal consultation process was not to simply consult on a particular undertaking but rather to build constructive relationships with the appropriate Native American tribes. Consultation should lead to constructive dialogs in which Native American tribes are active participants in the planning process. A copy of the letter and distribution list is included in **Appendix B**.

Public Involvement. A Notice of Availability for the Draft EA and Draft FONSI/FONPA was published in the *Aurora Sentinel* on 7 July 2011 and mailed to Federal, state, and local agencies on 6 July 2011. This was done to solicit comments on the Proposed Action and involve the local community in the decisionmaking process. The Draft EA and Draft FONSI/FONPA were available for a 30-day public and Government review period beginning on 7 July 2011 and ending on 5 August 2011. Upon receipt, comments from the public, Native American tribes, and Federal, state, and local agencies will be considered prior to a decision being made as to whether or not to sign a FONSI/FONPA.

A letter dated 2 August 2011 from the City of Aurora Planning Department concurred with the Proposed Action. A copy of this letter is included in **Appendix B**.

1.6 Organization of this Document

This document is organized into seven sections and three appendices. **Section 1** contains background information, a description of the purpose of and need for the Proposed Action, a description of the applicable regulatory requirements, and the organization of the EA. **Section 2** provides an introduction, a detailed description of the Proposed Action, the No Action Alternative, and the preferred alternative. **Section 3** contains a general description of the biophysical resources and baseline conditions that potentially could be affected by the Proposed Action and the No Action Alternative. **Section 4** presents an analysis of the potential environmental consequences. **Section 5** includes an analysis of the potential

cumulative impacts. **Section 6** lists the preparers of the document. **Section 7** lists the sources of information used in the preparation of the document. **Appendix A** includes examples of relevant Federal laws, regulations, and other requirements that are often considered as part of the analysis. **Appendix B** includes the IICEP, Native American, and public involvement correspondence. **Appendix C** contains calculations supporting the air quality analysis. Other appendices might be added to the document during the course of the analysis, as appropriate.

2. Proposed Action and Alternatives

This section describes the Proposed Action and the alternatives considered. As discussed in **Section 1.3.1**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action. In addition, CEQ regulations also specify the inclusion of a No Action Alternative against which potential effects can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations.

In determining reasonable alternatives, various selection criteria have been used. Clearly, the alternative must be able to meet the space requirements for the project and the necessary utility capacity. The utilities, especially the communication lines, need to be secure from possible intrusion or tampering; location within Government-secured property is highly desirable due to the cost of securing these lines when accessible from uncontrolled (non-Government) spaces. The facility itself must meet anti-terrorism/force protection (AT/FP) requirements with respect to perimeter control and access. Again, location within Government-secured property containing existing access control is highly desirable due to the costs in terms of infrastructure and personnel to create new controlled sites.

In addition to these facility constraints, there is an operational support criterion. The operations of the proposed MOUNTAINVIEW facility must be easily and readily accessible to the existing operations at the ADF-C. While a certain amount of non-contiguous capacity is inevitable, the existing operations require constant, frequent collaboration and communication on a near real-time basis. While the previously proposed Consolidated Facility envisioned moving all operational elements together to a new location, the current project involves only the NSA operational elements. Consequently, any site that prevents the immediate, rapid interface of NSA personnel with other ADF-C personnel does not meet the mission support criterion.

2.1 Introduction

The EA will address the NSA proposal to construct and operate the MOUNTAINVIEW facility within or in the vicinity of Buckley AFB, Colorado, and demolish the existing NSAC facility. The EA will also address reasonable alternatives to the Proposed Action and the No Action Alternative.

2.2 Description of the Proposed Action

The Proposed Action includes constructing and operating the proposed MOUNTAINVIEW facility within the ADF-C compound at Buckley AFB and demolishing the existing NSAC facility modular structures. **Figure 2-1** indicates the locations of the Proposed Action construction and demolition areas. The proposed MOUNTAINVIEW facility would be immediately north and northwest of the existing NSAC facility. A temporary contractor personal vehicle parking area would be constructed to support the proposed construction and demolition activities. Following the completion of the proposed construction and demolition activities, the temporary contractor parking area would be returned to natural preconstruction conditions. The Proposed Action would avoid future planned site use operations at the ADF-C. This section describes the construction, demolition, and operations activities associated with the Proposed Action.

The total area of potential soil disturbance associated with the Proposed Action would be approximately 24.5 acres: 20 acres from construction activities, 1 acre from demolition activities, 1 acre from the temporary contractor parking area, and 2.5 acres from the off-base portion of the proposed electric feeder line.

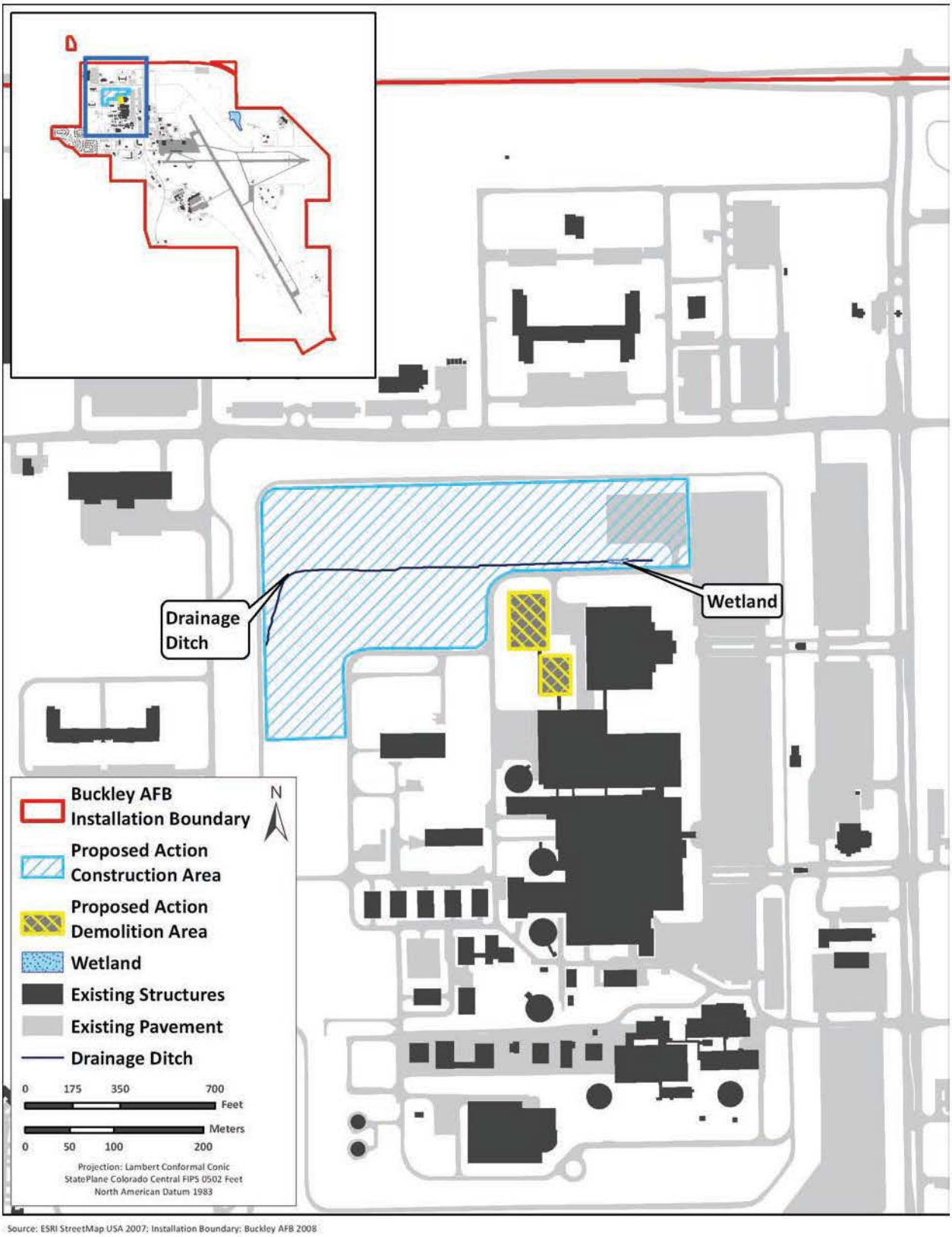

Figure 2-1. Proposed Action Construction and Demolition Areas

Construction Activities. Construction activities for the proposed MOUNTAINVIEW facility would include constructing an operations building, a chiller plant, a power plant, four 20,000-gallon capacity ASTs to contain an operational capacity of 60,000 gallons of diesel fuel, a 610-vehicle employee parking lot, a temporary contractor personal vehicle parking area, access drives, walkways, utilities, outdoor lighting, and storm water management infrastructure. The facility would accommodate low-impact development (LID) storm water management design techniques. Site preparation, construction, and equipment commissioning would occur between the second quarter of fiscal year (FY) 2012 and the first quarter of FY 2016. Details regarding the construction of the proposed facility are provided in the following paragraphs.

The operations building would measure approximately 201,000 ft^2 (140,000-ft^2 footprint) and contain administrative and operations spaces, computer labs, office space, a conference room, a tiered auditorium, a loading dock, and a cafeteria. It would be designed with two aboveground floors and a basement. The operations building would be no taller than Building D within the ADF-C and would match the appearance of the existing ADF-C buildings. All utilities including electric, water, wastewater, and natural gas service would be provided to the building. A sanitary lift station would be required to connect the operations building to the existing sanitary sewer system. The operations building would require approximately 105 gallons per minute (gpm) of potable water on average (310 gpm peak) and would be heated using a natural gas-fired hot water system.

The chiller plant would measure approximately 5,000 ft^2 and contain four, electrically driven, 500-ton chillers. It would include an office, control room, restroom, electrical equipment, chillers, pumps, and cooling towers. The chillers would provide chilled water to cool equipment and the interior of the operations building. The chillers would use a refrigerant with no Class I or Class II ozone-depleting substances. The chilled water would be distributed to the operations building via insulated, underground piping. The water requirement for the chiller plant is expected to be 76 gpm on average (111 gpm peak). The chiller plant would require a reliable water supply and would be heated and cooled via split system heat pumps. The cooling towers would be induced draft, counter flow units constructed of corrosion-resistant materials. The cooling tower makeup water would be provided from the potable water system. Cooling tower blowdown, a portion of the 76 gpm design, would be discharged to the sanitary sewer.

A new three-phase 18.5 megawatts (MW) electric feeder from the local public utility supplier (i.e., Xcel Energy) has been proposed to provide a reliable source of the required 6.45 MW power to the proposed MOUNTAINVIEW facility. The electric feeder line would be provided from a substation approximately 5 miles from Buckley AFB and would proceed through existing easements from the substation to Buckley AFB, where it would enter the base and terminate in a new pad-mounted switch inside the ADF-C compound. The proposed electric feeder line would be installed underground from the existing substation to the proposed pad-mounted switch. The off-base portion of the electric feeder line trench would be approximately 5 miles long and would use directional boring to cross beneath floodplains, wetlands, surface water. Directional boring could also be used to cross under some roadways. The on-base portion of the electric feeder line trench would be approximately 4 feet wide and approximately 1,800 feet long and would cross previously disturbed asphalt and grassy areas.

The standby, backup, electric power plant would measure approximately 19,000 ft^2 and contain up to 10 2.5-MW, diesel-powered, electrical generators and one low-wattage, diesel-powered, emergency generator (life safety generator). The 10 2.5-MW generators are anticipated to be used for a combined total of up to 3,700 hours per year for operations and maintenance purposes and nonemergency operational conditions (i.e., loss of power or potential loss of power based on local meteorological conditions). The low-wattage emergency generator would provide a short-term supply of electricity in an emergency situation. Mufflers would be installed on the generators to reduce noise. The generators would comply with the USEPA's nonroad diesel engine interim Tier 4 (Tier 4i) emissions standards using

selective catalytic reduction technology. The potable water requirement for the power plant would be 20 gpm on average (62 gpm peak). The power plant would be heated and cooled using split system heat pumps.

Four 20,000-gallon capacity ASTs (number and size of storage tanks could vary) would be constructed to provide storage provisions for a 3-day supply of diesel fuel oil number 2. The electrical generators are anticipated to require approximately 20,000 gallons of liquid fuel per day; therefore, approximately 60,000 gallons of diesel fuel oil would need to be stored on site at any one time. An additional 20,000 gallons of storage provisions would be available to account for storage tank headspace requirements. The double-walled, steel ASTs would be installed on a concrete pad.

An employee parking lot with approximately 610 parking spaces would be constructed for the proposed facility within the ADF-C security fence line, which would be adequate for up to 850 people across three shifts. The employee parking lot and all associated access roadways would have a footprint of approximately 130,000 ft^2. The employee parking lot would replace an existing, 1.3-acre, gravel parking area and 18 parking spaces from an existing asphalt parking lot that would be demolished in order to accommodate the proposed MOUNTAINVIEW facility.

Appropriate pavements, access drives, sidewalks, curbs, gutters, storm water drainage, lighting, and landscaping would be part of the construction at the proposed facility. The Proposed Action would accommodate existing drainage patterns. Storm water would be managed to meet the requirements of Buckley AFB's Municipal Separate Storm Sewer System (MS4) permit; EISA Section 438; and Federal, state, and local requirements. Storm water management infrastructure is still being designed but might include drainage culverts and detention ponds, as necessary.

Source water for the proposed facility would include the installation's existing water supply line from the City of Aurora. Average water demand for the proposed MOUNTAINVIEW facility would be approximately 201 gpm (105 gpm for the operations building, 76 gpm for the chiller plant, and 20 gpm for the power plant); peak water demand would be approximately 483 gpm (310 gpm for the operations building, 111 gpm for the chiller plant, and 62 gpm for the power plant). Domestic hot water would be generated by electric storage tank water heaters, instantaneous water heaters, or solar water heaters. All three proposed buildings would be connected to the sanitary sewer system.

Natural gas would be used as the primary fuel source to heat the proposed MOUNTAINVIEW facility. The three buildings of the proposed facility would be designed to be expandable and to achieve an energy efficiency rating of Leadership in Energy and Environmental Design (LEED) Silver at a minimum and would target a rating of LEED Gold.

A drainage ditch (approximately 8,077 ft^2) and an isolated, nonjurisdictional wetland area (approximately 220 ft^2) have been identified within the footprint of the proposed MOUNTAINVIEW facility (McKee 2010). While the wetland does meet the definition of a wetland per EO 11990, it appears that the hydrology, soils, and vegetation are present due to lack of maintenance of a man-made drainage feature and outfall. Furthermore, wetland values such as wildlife habitat value, storm water buffering capacity, and groundwater recharge at the wetland are extremely low. The wetland cannot be avoided and would be eliminated during the construction of the proposed facility. Because of the low value of this wetland, instead of offsetting the loss of this wetland through traditional enhancement of wetlands elsewhere, a contribution to overall wetlands conservation on Buckley AFB would be performed via contributing some bio-engineering materials for small-scale stabilization efforts along East Toll Gate Creek or in the area of the Proposed Action to meet the spirit and intent of EO 11990. If the Proposed Action is selected, the NSA would coordinate with Buckley AFB in the selection of the wetlands conservation contribution and fund the associated activities.

An approximately 1-acre, temporary, gravel contractor personal vehicle parking area would be constructed to support the proposed construction and demolition activities. Construction of the temporary contractor parking area would require a currently grass-covered area to be covered with gravel to support parking for approximately 100 vehicles. Appropriate drive lanes would be placed to ensure efficient movement of vehicles within the temporary contractor parking area. Following the completion of the proposed construction and demolition activities, the temporary contractor parking area would be returned to natural conditions. The location of the temporary contractor parking area has not been finalized, but would be at one of three locations. Option 1 would entail constructing the temporary contractor parking area on Buckley AFB immediately west of the ADF-C security fence. Option 2 would entail constructing the temporary contractor parking area on Buckley AFB immediately south of East 6th Avenue. Option 2 would require approximately 700 feet of the Buckley AFB fence line to be temporarily relocated so that personal vehicles are kept outside of the controlled access portion of Buckley AFB. Option 3 would entail constructing the temporary contractor parking area on private property north of East 6th Avenue. Shuttle buses would be used to transport contractors from the Option 2 or Option 3 temporary contractor parking areas to the Proposed Action construction and demolition areas. The shuttle buses would access Buckley AFB through the 6th Avenue Gate.

Demolition Activities. The Proposed Action construction area is primarily undeveloped, but contains an approximately 1.3-acre, gravel parking lot. The existing gravel parking lot and 18 parking spots from the asphalt parking lot east of Building D would be removed to accommodate the proposed operations building. Sufficient parking is available outside of the ADF-C fence line to compensate for the demolition of the gravel parking lot and a portion of the asphalt parking lot during construction. Existing parking lots north of Steamboat Avenue would be used for temporary employee parking during construction and for overflow parking during operations.

Demolition activities would also entail removing the NSAC facility at Buckley AFB (see **Figure 2-1**). The NSAC facility was constructed in 2005 and is composed of approximately 54 one-story, wooden modular structures. The modular structures are arranged in a manner that forms two buildings. Collectively, the modular structures measure approximately 50,000 ft^2; therefore, total ground disturbance from demolition activities outside of the construction footprint would be slightly greater than 1 acre. The demolition of the modular structures would occur sometime after the construction of the proposed MOUNTAINVIEW facility, after the first quarter of FY 2016. The demolition contractors would recycle the NSAC facility modular structures to the greatest extent possible.

Facility Operations. Construction and demolition activities would occur in a phased approach to allow continuous, uninterrupted operation of the NSAC facility and maintenance of AT/FP requirements. The proposed facility would house up to 850 personnel. Most of these individuals would transfer from the existing NSAC facility; however, there would be a net gain of approximately 100 personnel over the 10-year period subsequent to construction to support current, ongoing missions. As is currently done, personnel would be spread across three shifts. The ADF-C would be responsible for managing and maintaining the proposed MOUNTAINVIEW facility.

2.3 Alternative Construction Areas Considered and Eliminated from Detailed Analysis

Two alternatives to the Proposed Action construction area were considered but eliminated from detailed analysis because they do not meet selection criteria and are not viable alternatives, as described below. **Figure 2-2** illustrates the locations of the two construction area alternatives (Gateway Park Construction Area Alternative and Remote Terminal Facility [RTF] Construction Area Alternative) that were dismissed from detailed analysis.

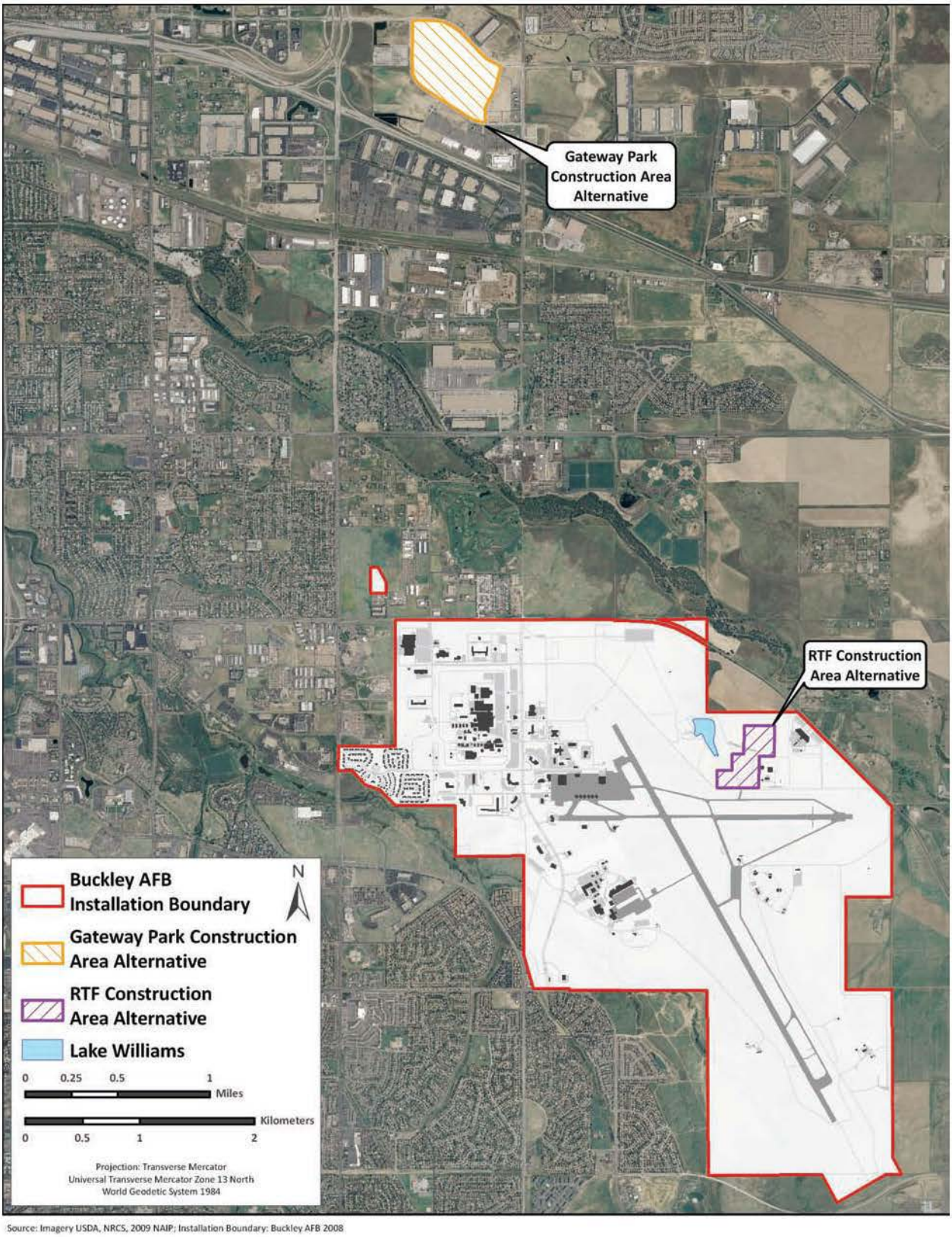

Figure 2-2. Construction Area Alternatives Considered and Eliminated From Detailed Analysis

2.3.1 Gateway Park Construction Area Alternative

The Gateway Park Construction Area Alternative includes constructing the proposed MOUNTAINVIEW facility at an undeveloped parcel in Gateway Park IV East, which is approximately 2 miles to the north of the ADF-C and approximately 0.25 miles west of the intersection of East 40th Avenue and Tower Road (see **Figure 2-2**). The location of the Gateway Park Construction Area Alternative is the location for the previously considered multiagency Consolidated Facility.

Under the Gateway Park Construction Area Alternative, the proposed MOUNTAINVIEW facility, temporary contractor parking area, and all supporting infrastructure would be constructed on privately owned land that is bound to the south and west by North Salida Street, to the east by North Walden Street, and to the north by East 40th Avenue. The undeveloped parcel is part of the Gateway Park development, which is composed of 1,300 acres of office, hotel, retail, residential, warehouse distribution, and manufacturing properties. The parcel is mostly undeveloped but includes an electrical transformer and a fire hydrant on the eastern and northern edges of the property, respectively. Two storm water detention ponds are on the parcel and include vegetation indicative of wetlands. The proposed MOUNTAINVIEW facility and temporary contractor parking area would be positioned on the property so that the disturbance area would avoid existing wetlands and detention ponds.

Because the Gateway Park Construction Area Alternative is outside of Buckley AFB, additional security and AT/FP provisions would need to be constructed. Such provisions would include constructing a perimeter fence and physical barriers, a closed-circuit television monitoring system, and an approximately 1,000-ft^2 visitor center. Additionally, it is assumed that a fiber optic communications line would need to be trenched between the ADF-C and the Gateway Park Construction Area Alternative. The utility trench would be approximately 5.4 miles long. The construction footprint and utility trench would be planned to avoid direct construction in wetland areas. To avoid wetlands and private property issues, it is assumed that the utility trench would be constructed along or within existing roadway right-of-ways (i.e., Aspen Drive, East 6th Avenue, North Airport Boulevard, East Colfax Avenue, Tower Road, and North Salida Street). All other utility services are already available to the property; however, a new three-phase electrical feeder and a pad-mounted switch would need to be constructed in coordination with Xcel Energy in order to meet electrical demand. The electrical feeder would be trenched between the pad-mounted switch and the proposed power plant.

Although previously considered as the site for the Consolidated Facility, the Gateway Park Construction Area Alternative does not meet the selection criteria for the proposed MOUNTAINVIEW facility, nor does it represent a technically and fiscally acceptable solution. While construction of the proposed MOUNTAINVIEW facility within the Gateway Park Construction Area Alternative would result in a modernized and robust utility infrastructure, it would come at the cost of losing the required collaborative work environment. Current operations provide real-time collaborative interaction between all agencies involved in the operation. While the Consolidated Facility would have moved all these interagency assets to a single location, the use of the Gateway Park Construction Area Alternative for NSAC operations alone would sever the effectiveness of current operational interactions. The use of the Gateway Park Construction Area Alternative would also degrade the current technical support program by increasing the distance and response time for addressing technical infrastructure maintenance issues. Lacking additional billets or resources, response time for support technologists would increase due to the issues of distance and time. Additionally, the increase in distance from the ADF-C to the proposed MOUNTAINVIEW facility would result in degradation of data through signal loss, resulting in mission compromise. As a result, separating the proposed MOUNTAINVIEW facility from current operations at the ADF-C compound would severely compromise the fundamental premise behind its location at the ADF-C and fail to meet the inherent need of the project.

On the facility side, construction issues, coordination, and costs would also be substantially increased by the necessary communications infrastructure improvements. The 5.4-mile communications link between the ADF-C and the Gateway Park Construction Area Alternative would also present a point of security vulnerability that would require constant monitoring, further increasing recurring operations and maintenance costs. As a result of all of these factors, the Gateway Park Construction Area Alternative does not meet the selection criteria and has been determined not to be a viable alternative. This alternative has been eliminated from detailed study in this EA.

2.3.2 Remote Terminal Facility Construction Area Alternative

The RTF Construction Area Alternative would include constructing the proposed MOUNTAINVIEW facility adjacent to the RTF on Buckley AFB (see **Figure 2-2**). The proposed MOUNTAINVIEW facility, a temporary contractor parking area, and supporting infrastructure would be constructed on the northeastern side of Buckley AFB, approximately 1.5 miles southeast of the ADF-C. The property contains an existing skeet range, gravel parking lot, gravel construction storage area, and grass-covered areas. Two wells and an electrical manhole are on the southwestern portion of the property. Environmental Restoration Program (ERP) Site 5 is within the southern portion of the property. ERP Site 5 is slated for closure but has not yet received a Record of Decision. Additionally, the RTF Construction Area Alternative would result in increased costs due to soil characterization and possible remediation associated with the skeet range, which could contain lead shot from use before the range became a non-lead shot only range.

As with the Gateway Park Construction Area Alternative, because the RTF Construction Area Alternative is in a remote portion of the Buckley AFB, upgraded utility infrastructure would need to be extended to this location. It is assumed that all utilities, including electric, water, sanitary sewer, natural gas, and fiber optic communications, would need to be upgraded or extended, as applicable, to the property. Extension of these utilities would entail extensive ground trenching. Additionally, because the RTF Construction Area Alternative is outside of the ADF-C fence line, additional security provisions would need to be constructed including perimeter fencing and physical barriers, a closed-circuit television monitoring system, and an approximately 1,000-ft^2 visitor center.

The proposed MOUNTAINVIEW facility, a temporary contractor parking area, and support infrastructure would displace the existing skeet range, gravel parking lot, and construction storage area. Use of the RTF Construction Area Alternative would require relocation of these facilities, which would incur additional environmental consequences, and planning and construction costs.

Like the Gateway Park Construction Area Alternative, the RTF Construction Area Alternative does not meet the selection criteria for the proposed MOUNTAINVIEW facility, nor does it represent a technically and fiscally acceptable solution. While construction of the proposed MOUNTAINVIEW facility at the RTF Construction Area Alternative would result in a modernized and robust utility infrastructure, it would come at the cost of losing the required collaborative work environment. Current operations provide real-time collaborative interaction between all agencies involved in the operation. While the Consolidated Facility would have moved all these interagency assets to a single location, the use of the RTF Construction Area Alternative for NSAC operations alone would sever the effectiveness of current operational interactions. The use of the RTF Construction Area Alternative would also degrade the current technical support program by increasing the distance and response time for addressing technical infrastructure maintenance issues. Lacking additional billets or resources, response time for support technologists would increase due to the issues of distance and time. Additionally, the increase in distance from the ADF-C to the proposed MOUNTAINVIEW facility would result in degradation of data through signal loss, resulting in mission compromise. As a result, separating the proposed MOUNTAINVIEW

facility from current operations at the ADF-C compound would severely compromise the fundamental premise behind its location at the ADF-C and fail to meet the inherent need of the project.

Construction costs would also be substantially increased by the necessary utility improvements. Ground trenching from the ADF-C to the RTF Construction Area Alternative would incur additional costs, result in extensive ground disturbance, and potentially lengthen the schedule for construction. Additionally, the communications link between the ADF-C and the RTF Construction Area Alternative would present a point of security vulnerability that would require constant monitoring, further increasing recurring operations and maintenance costs.

Because the RTF Construction Area Alternative is within a currently active ERP site; would require extensive utility improvements, soil characterization and possible remediation of the skeet range, and relocation of the skeet range, gravel parking lot, and construction storage area; and would incur substantially increased costs, the RTF Construction Area Alternative does not meet the selection criteria and has been determined not to be a viable alternative. This alternative has been eliminated from detailed study in this EA.

2.4 No Action Alternative

CEQ regulations require the analysis of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be evaluated.

Under the No Action Alternative, the NSA would not implement the Proposed Action. Without implementing the Proposed Action, the existing NSAC facility would remain in service and no new facility would be constructed. Personnel at the NSAC facility would continue to use the outdated and undersized facilities that do not have sufficient space and infrastructure capabilities to meet current and future mission requirements. The No Action Alternative will be further evaluated in detail in this EA.

2.5 Identification of Preferred Alternative

The Preferred Alternative is the Proposed Action, as described in **Section 2.2**. Upon completion of the EA, the NSA will determine whether the Proposed Action would result in significant impacts. If such impacts are predicted, the NSA would provide mitigation to reduce impacts below the level of significance, undertake an EIS, or abandon the Proposed Action. The EA will also be used to guide the NSA in implementing the Proposed Action in a manner consistent with USAF and NSA standards for environmental stewardship.

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3. Affected Environment

3.1 Noise

3.1.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on a rooftop. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or as annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations. Although human response to noise varies, measurements can be calculated with instruments that record instantaneous sound levels in decibels. A-weighted decibel (dBA) is used to characterize sound levels (measured in dBA) that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. In clinical hearing assessments, it has been shown that the threshold of audibility falls within a range of 0 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA 1981a). **Table 3-1** compares common sounds and shows how they rank in terms of the effects on hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981b).

Table 3-1. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible*
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying; Hearing damage (8 hours)
100	Garbage truck	Very annoying*
110	Pile drivers	Maximum vocal effort*
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981b, * = HDR Extrapolation

Sound levels, resulting from multiple single events, are used to characterize community noise effects from aircraft or vehicle activity and are measured in day-night average sound level (DNL). The DNL noise metric incorporates a "penalty" for evening and nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging single event values for a given 24-hour period. DNL is the preferred sound level metric used to characterize noise impacts of the Federal Aviation Administration, U.S. Department of Housing and Urban Development (HUD), USEPA, and DOD for modeling airport environments.

DNL is the metric recognized by the U.S. government for measuring noise and its impacts on humans. According to the USAF, the Federal Aviation Administration, and the HUD criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds a DNL of 75 dBA, "normally unacceptable" in regions exposed to noise between 65 dBA and 75 dBA, and "normally acceptable" in areas exposed to noise of 65 dBA or under. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of a DNL sound level (FICON 1992). For outdoor activities, the USEPA recommends a DNL sound level of 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).

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed to is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The USAF maintains an Occupational Noise and Hearing Conservation Program, described in the Air Force Occupational Safety and Health (AFOSH) Standard 48-20, dated 2006. The AFOSH standard sets a threshold value of 80 dBA for civilians and USAF personnel below which noise exposures are considered harmless. The standard defines a "hazardous noise environment" where continuous exposures are at or above 85 dBA. The standard also mandates the use of hearing protection equipment that will reduce sound levels to acceptable limits in hazardous noise environments. The highest allowable sound level to which workers can be exposed to is 115 dBA and exposure to this level must not exceed 0.5 minutes within a 24-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA for unprotected personnel.

Construction Sound Levels. Building demolition and construction work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, saws, and other work equipment. **Table 3-2** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

3.1.2 Existing Conditions

The ambient noise environment at and surrounding Buckley AFB is affected mainly by military aircraft operations and automobile traffic. Buckley AFB is southeast of Denver, Colorado, within the Aurora city limits. There are several major roadways less than 5 miles from the installation, including I-70, I-225, U.S. Route 40, and E-470. Local transportation routes include 6th Avenue/Colorado Highway 30 to the north and east and Airport Boulevard to the west.

Table 3-2. Predicted Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Clearing and Grading	
Bulldozer	80
Grader	80–93
Truck	83–94
Roller	73–75
Excavation	
Backhoe	72–93
Jackhammer	81–98
Building Construction	
Concrete mixer	74–88
Welding generator	71–82
Pile driver	91–105
Crane	75–87
Paver	86–88

Source: USEPA 1971

Buckley AFB supports numerous assigned and transient aircraft including fighter jets, cargo and personnel aircraft, and helicopters (BAFB 2011a). The airfield composes the majority of the southeastern portion of the installation; as such, noise from aircraft operations affects the majority of the installation. The 65 dBA DNL noise contour from aircraft operations was plotted on an aerial map as shown on **Figure 3-1**. The noise contours from aircraft operations extend roughly to the northwest and southeast along the runway. The 65 dBA DNL noise contour encompasses the eastern portion of the Proposed Action construction area and the entire Proposed Action demolition area (NSAC facility). Depending on the final location of the temporary contractor parking area, it would be within the 65 dBA DNL noise contour.

Considering the vehicle traffic and military aircraft operations at and adjacent to Buckley AFB, the ambient sound environment around the Proposed Action areas is likely to resemble a busy urban atmosphere.

3.2 Land Use

3.2.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational. USAF installation land use planning commonly uses 12 general land use categories: Airfield, Aircraft Operations and Maintenance, Industrial, Administrative, Community (Commercial), Community (Service), Medical, Housing (Accompanied), Housing (Unaccompanied), Outdoor Recreation, Open Space, and Water (USAF 1998).

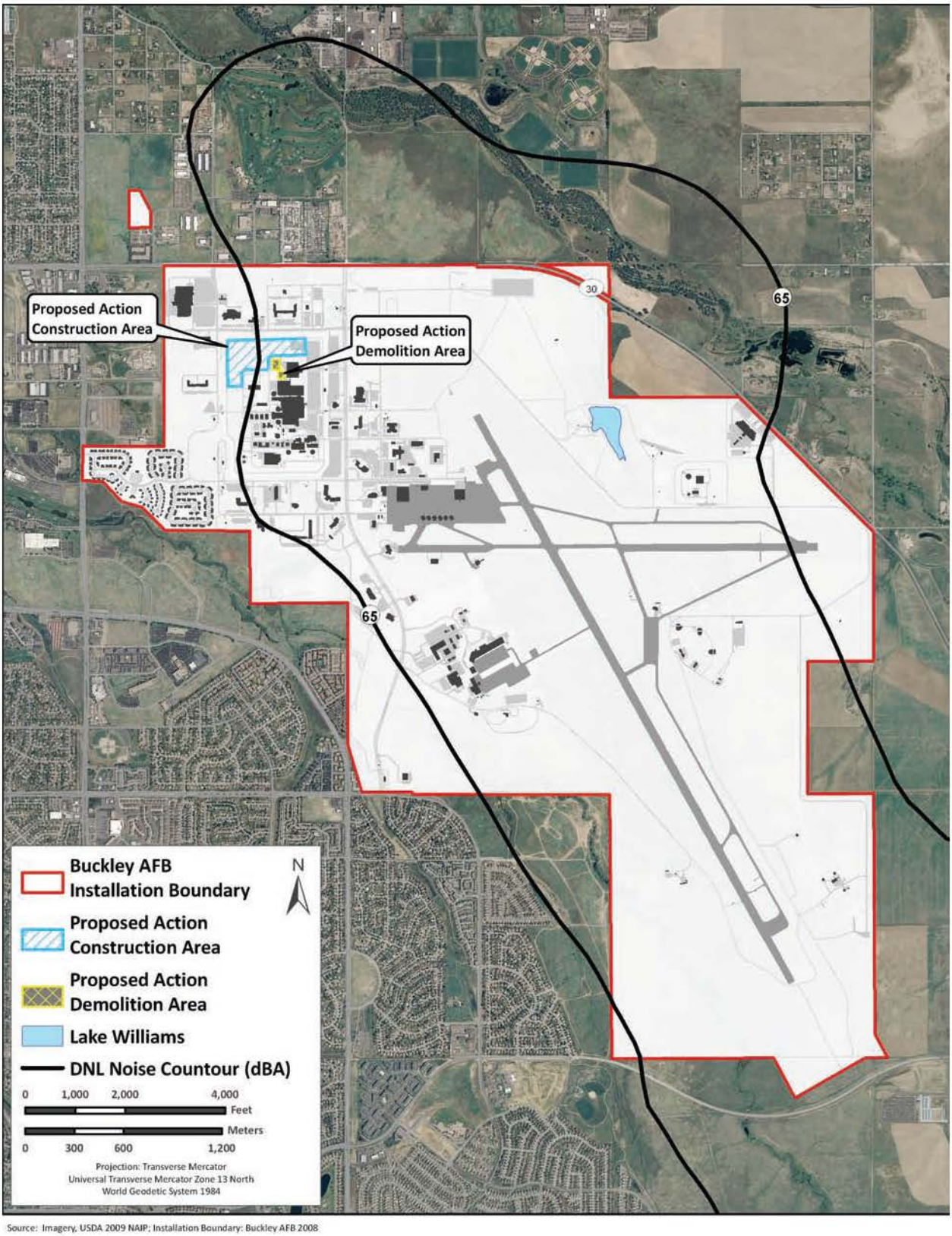

Figure 3-1. The 65 dBA DNL Noise Contour from Aircraft Operations

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. According to Air Force Pamphlet 32-1010, *Land Use Planning*, land use planning is the arrangement of compatible activities in the most functionally effective and efficient manner (USAF 1998). Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning within the civilian sector include written master plans/management plans, policies, and zoning regulations. The USAF comprehensive planning process also uses functional analysis, which determines the degree of connectivity among installation land uses and between installation and off-installation land uses, to determine future installation development and facilities planning (USAF 1998).

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 uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

3.2.2 Existing Conditions

Buckley AFB is in western Arapahoe County, Colorado, within the City of Aurora (see **Figure 1-1**). Due to its location on the eastern side of the urbanized portion of the City of Aurora, access to Buckley AFB is provided by several major roadways, including I-225 to the west, I-70 (also known as U.S. Highway 40 and U.S. Highway 287 in this location) to the north, E-470 toll road to the east, and 6th Avenue/Colorado Highway 30 to the northeast. The area surrounding the installation consists of open space (northeast, east, and southeast); residential (south and southwest); mixed residential and commercial (west); and light industry, commercial businesses, and open space (north and northwest). Specific uses immediately adjacent to the installation consist of the Environmental Camp/Park to the north; the Plains Conservation Center, an education facility and state-designated natural area, to south; several schools to the northwest; and residential subdivisions (Side Creek and Tollgate Overlook) to the south and southwest.

Buckley AFB consists of 3,897 acres on the eastern edge of urbanized portions of the City of Aurora, Colorado. Buckley AFB supports a population of 92,039 people, including on- and off-installation active-duty military personnel, National Guard and Reserve personnel, civilian employees, contractors, retirees, veterans, and dependents. This figure includes approximately 7,100 military personnel (including 3,100 active-duty personnel) and 4,900 civilian employees and contractors. In addition, the installation supports 1,200 dependents that live on-installation (Spann 2011). Retirees, veterans, and dependents that live off-installation comprise the remainder of the population supported by Buckley AFB. The 460th SW is the host wing of the installation and provides support to 77 tenants, including the ADF-C; 140th Wing, Colorado Air National Guard; 566th Intelligence Squadron; 743rd Military Intelligence Battalion; U.S. Army Corps of Engineers (USACE); Navy Operations Support Center; Army Aviation Support Facility; and several off-installation tenants.

Buckley AFB has 15 land use categories: Administrative, Aircraft Operations and Maintenance, Airfield, Airfield Pavements, Community Commercial, Community Service, Accompanied Housing, Unaccompanied Housing, Industrial, Medical, Mission Operations and Maintenance, Open Space, Outdoor Recreation, Training, and Water (see **Figure 3-2**) (BAFB 2003a). The majority of installation's land (2,771 acres) is unimproved with more than half (approximately 1,588 acres) occupied by the Airfield/Airfield Pavements (BAFB 2009a). The Airfield/Airfield Pavements, which runs northwest-southeast and consists of an 11,085-foot runway (14/32), 2 paved overruns, 13 taxiways, 3 aircraft parking ramps, and 2 disarm pads, is the dominant land use at Buckley AFB (BAFB 2003a). Due to their interdependent natures, Aircraft Operations and Maintenance and Industrial uses are found in

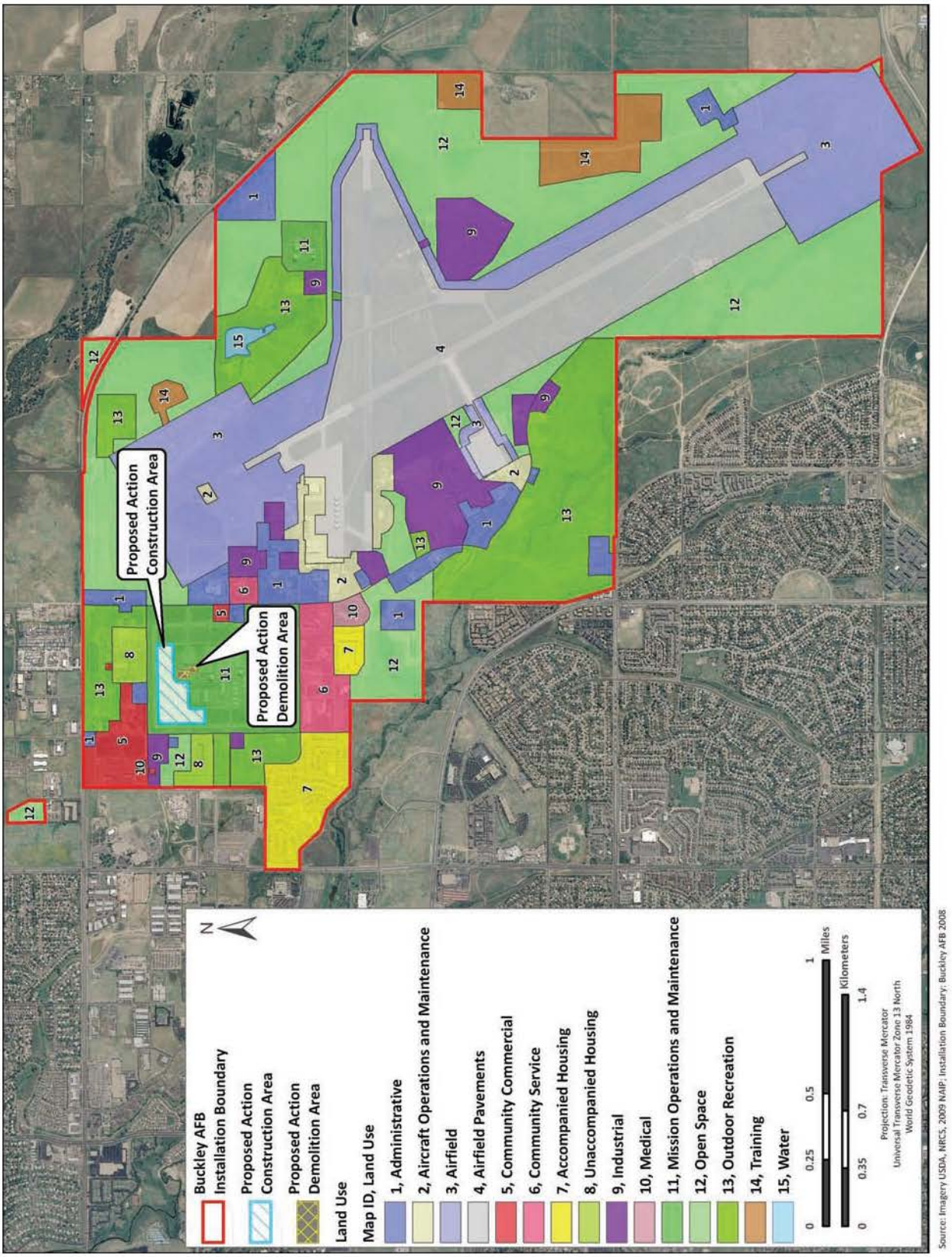

Figure 3-2. Land Use at Buckley AFB

close proximity to the Airfield with most occurring to the west. Moving outward to the west are Administrative, Mission Operations and Maintenance, Unaccompanied Housing, and Community Commercial/Support land uses, which form the main cantonment area in the northwestern portion of the installation. Eastward from the Airfield use are Industrial (Munitions Storage Area) and Outdoor Recreation (Williams Lake) land uses, with an Administrative facility (Navy/Marine Reserve Center, Denver) at the eastern boundary of the installation (BAFB 2003a). There are active-duty facilities throughout the installation, mostly in the western half.

Proposed future land uses, as discussed in the Buckley AFB General Plan, include increases in Accompanied Housing, Community Service, Outdoor Recreation, Training, and Industrial land uses and a decrease of Open Space land use. In addition, based on growth assumptions, six dormitories might be required. Land area has been set aside west of the 6th Avenue Gate and near the second dormitory for these facilities, if necessary (BAFB 2003a).

The Proposed Action is primarily within the ADF-C, which is within the Mission Operations and Maintenance land use category. The northwestern portion of the ADF-C, where the Proposed Action construction area is proposed, is undeveloped and adjacent to Unaccompanied Housing, Administrative, Community Commercial, Industrial, Outdoor Recreation, and Open Space land uses. The final site of the temporary contractor parking area has not been finalized, but could be outside of the ADF-C on Buckley AFB within Unaccompanied Housing or Outdoor Recreation land uses, or off-installation within the City of Aurora's O (Open District) or M-1 (Light Industrial District) zoning districts. The Proposed Action is partially inside the 65 dBA DNL noise contour from aircraft operations at Buckley AFB (see **Section 3.1**).

While municipal zoning designations and ordinances are not applicable on Federal property, Buckley AFB and the Proposed Action are within the City of Aurora's O zoning district. The City of Aurora zoning districts immediately surrounding the installation include O, M-1, PCZD (Planned Community Zone District, including single- and multi-family residential, park, golf, and open space), B-1 (Retail Business District), R-1 (Low Density Single-Family Residential District), PD (Planned Development District), and E-470 R & D (E-470 Corridor Zone District, Buckley Research & Development Subarea) (City of Aurora 2010).

Land uses surrounding Buckley AFB are primarily regulated by the City of Aurora; however, there are several parcels of unincorporated Arapahoe County that abut the eastern and northeastern portions of the installation. Arapahoe County has identified general land use designations for the areas east (Employment) and south (Open Space) of Buckley AFB, and acknowledged that these areas are within the Aurora E-470 Plan Area (Arapahoe County 2001). The Arapahoe County zoning districts immediately adjacent to the installation are A-1 (Agriculture) and R-A (Residential-Agricultural); however, O (Open), F (Floodplain), and MU (Mixed Use) zoning districts adjoin the A-1 and R-A zoning districts (Arapahoe GIS 2011).

Future growth and development in the City of Aurora are addressed in the city's 2009 Comprehensive Plan, which is a strategic document guiding city policymaking. Based on this Plan, Buckley AFB is also within the Buckley AFB strategic area (City of Aurora 2010). The City of Aurora's zoning regulations recognize that airport operations, such as those at Buckley AFB, subject certain areas that surround airports to high noise levels and possible crash hazards, and that incompatible land use near the installation can negatively impact military missions. Therefore, Buckley AFB and the surrounding area, mostly to the east and south, are also part of the Buckley AFB Airport Influence District, an overlay district whose purpose is to minimize risks to public health and safety that could result from close proximity to airports by restricting heights, and construction, expansion, or relocation of structures and uses (City of Aurora 2006). Restrictions vary based on location within Buckley AFB Airport Influence District subareas, including clear zone, accident potential zones (APZs) I and II, and various noise-related subareas.

3.3 Air Quality

3.3.1 Definition of the Resource

In accordance with Federal CAA requirements, the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

Ambient Air Quality Standards. Under the CAA, the USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for ozone (O_3), measured as either volatile organic compounds (VOCs) or total nitrogen oxides (NO_x), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur oxides (SO_x), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb) (40 CFR Part 50). The CAA also gives the authority to states to establish air quality rules and regulations. The State of Colorado has adopted the NAAQS and has promulgated an additional standard for SO_x. **Table 3-3** presents the USEPA NAAQS and the State of Colorado ambient air quality standards.

Attainment Versus Nonattainment and General Conformity. The USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment. USEPA has delegated the authority for ensuring compliance with the NAAQS in the State of Colorado to the CDPHE. In accordance with the CAA, each state must develop a State Implementation Plan (SIP), which is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS.

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

Federal Prevention of Significant Deterioration. Federal PSD regulations apply in attainment areas to major stationary sources (i.e., sources with the potential to emit 250 tpy of any criteria pollutant) and significant modifications to major stationary sources (i.e., change that adds 15 to 40 tpy to the facility's potential to emit depending on the pollutant). Additional PSD major source and significant modification thresholds apply for greenhouse gases (GHGs). PSD regulations can also apply to stationary sources if (1) a proposed project is within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas), and (2) regulated stationary source pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 microgram per cubic meter ($\mu g/m^3$) or more (40 CFR 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's class designation (40 CFR 52.21[c]).

Table 3-3. National and State Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	State	
CO	8-hour (1)	9 ppm (10 mg/m^3)	--	None
	1-hour (1)	35 ppm (40 mg/m^3)	--	None
Pb	Quarterly average	1.5 µg/m^3	--	Same as Primary
	Rolling 3-Month Average	0.15 µg/m^3 (2)	--	Same as Primary
NO_2	Annual Arithmetic Mean	53 ppb (3)	--	Same as Primary
	1-hour	100 ppb (4)	--	None
PM_{10}	24-hour (5)	150 µg/m^3	--	Same as Primary
$PM_{2.5}$	Annual Arithmetic Mean (6)	15 µg/m^3	--	Same as Primary
	24-hour (7)	35 µg/m^3	--	Same as Primary
O_3	8-hour (8)	0.075 ppm (2008 Standard)	--	Same as Primary
	8-hour (9)	0.08 ppm (1997 Standard)	--	Same as Primary
	1-hour (10)	0.12 ppm	--	Same as Primary
SO_2	Annual Arithmetic Mean	0.03 ppm	--	0.5 ppm (3-hour) (1)
	24-hour (1)	0.14 ppm	--	0.5 ppm (3-hour) (1)
	3-hour	--	700 µg/m^3 (0.267 ppm)	None
	1-hour	75 ppb (11)	--	None

Sources: USEPA 2011a and CDPHE 2011

Notes: Parenthetical values are approximate equivalent concentrations.

1. Not to be exceeded more than once per year.
2. Final rule signed 15 October 2008.
3. The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
4. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective 22 January 2010).
5. Not to be exceeded more than once per year on average over 3 years.
6. To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.
7. To attain this standard, the 3-year average of the weighted annual of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective 17 December 2006).
8. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective 27 May 2008).
9. a. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
   b. The 1997 standard – and the implementation rules for that standard – will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
   c. USEPA is in the process of reconsidering these standards (set in March 2008).
10. a. USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard (anti-backsliding).
    b. The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
11. Final rule signed on 2 June 2010. To attain this standard, the 3-year average of the 99th percentile of daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Key: ppm = parts per million; ppb = parts per billion; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter

Federal Nonattainment New Source Review Requirements. Federal NANSR regulations apply in nonattainment areas to major stationary sources (i.e., sources with the potential to emit 100 tpy of any criteria pollutant or lower depending on the severity of nonattainment) and significant modifications to major stationary sources (i.e., net change that adds 15 to 40 tpy to the facility's potential to emit depending on the pollutant) [40 CFR 51.165].

Title V Requirements. Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A Title V major stationary source has the potential to emit more than 100 tpy of any one criteria air pollutant, 10 tpy of a hazardous air pollutant (HAP), or 25 tpy of any combination of HAPs. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality. Section 112 of the CAA defines the sources and kinds of HAPs.

Greenhouse Gas Emissions. EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, states that Federal agencies must analyze GHGs in every NEPA action. GHGs are gaseous emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane, and nitrous oxide. GHGs are primarily produced by the burning of fossil fuels and through industrial and biological processes. On 22 September 2009, the USEPA issued a final rule for mandatory GHG reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on CO_2 and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons or more of CO_2 equivalent emissions per year but excludes mobile source emissions. The first emissions report is due in 2011 for 2010 emissions. GHG emissions will also be factors in PSD and Title V permitting and reporting, according to a USEPA rulemaking issued on 3 June 2010 (75 Federal Register [FR] 31514). GHG emissions thresholds of significance for permitting of stationary sources are 75,000 tons CO_2 equivalent per year and 100,000 tons CO_2 equivalent per year under these permit programs.

EO 13514 was signed in October 2009 and requires agencies to set goals for reducing GHG emissions. One requirement within EO 13514 is the development and implementation of an agency Strategic Sustainability Performance Plan (SSPP) that prioritizes agency actions based on lifecycle return on investment. Each SSPP is required to identify, among other things, "agency activities, policies, plans, procedures, and practices" and "specific agency goals, a schedule, milestones, and approaches for achieving results, and quantifiable metrics" relevant to the implementation of EO 13514. On 26 August 2010, DOD released its SSPP to the public. This implementation plan describes specific actions the DOD will take to achieve its individual GHG reduction targets, reduce long-term costs, and meet the full range of goals of the EO. All SSPPs segregate GHG emissions into three categories: Scope 1, Scope 2, and Scope 3 emissions. Scope 1 GHG emissions are those directly occurring from sources that are owned or controlled by the agency. Scope 2 emissions are indirect emissions generated in the production of electricity, heat, or steam purchased by the agency. Scope 3 emissions are other indirect GHG emissions that result from agency activities but from sources that are not owned or directly controlled by the agency. The GHG goals in the DOD SSPP include reducing Scope 1 and Scope 2 GHG emissions by 34 percent by 2020, relative to FY 2008 emissions, and reducing Scope 3 GHG emissions by 13.5 percent by 2020, relative to FY 2008 emissions. The first GHG air quality emissions report is due in 2011 for 2010 emissions.

3.3.2 Existing Conditions

Buckley AFB and the areas to be disturbed under the Proposed Action are within Arapahoe County, Colorado. Arapahoe County is part of the Metropolitan Denver Interstate (MDI) AQCR. The MDI AQCR also includes the counties of Adams, Boulder, Clear Creek, Denver, Douglas, Gilpin, and

Jefferson, Colorado (USEPA 2002a). According to 40 CFR Part 81, no Class I areas are within 10 kilometers of the areas of the Proposed Action (USEPA 2011b).

As defined by 40 CFR 81.306, the portions of the MDI AQCR affected by the Proposed Action are designated as attainment/unclassified for all criteria pollutants except CO, PM_{10}, and 8-hour O_3. CO is designated as serious maintenance, and PM_{10} is designated as moderate maintenance. 8-hour O_3 is designated as Former Subpart 1 nonattainment (USEPA 2002b, USEPA 2010a, USEPA 2010b, USEPA 2010c). **Table 3-4** summarizes the attainment status for the criteria pollutants in Arapahoe County and their associated New Source Review major source thresholds and significant emissions rates.

The most recent emissions for Arapahoe County and the MDI AQCR are shown in **Table 3-5**. Arapahoe County is considered the local area of influence, and the MDI AQCR is considered the regional area of influence for this air quality analysis.

Buckley AFB has a Title V Operating Permit (Permit Number: 95OPAR118) issued by the CDPHE that was renewed on 1 November 2009. Section I, Condition No. 3.1 of the permit states the facility is categorized as a Nonattainment major stationary source due to the potential to emit more than 100 tpy of NO_x. In addition, the permit states the facility is categorized as a PSD major stationary source due to the potential to emit more than 250 tpy of NO_x. Stationary emissions sources at Buckley AFB include emergency and contingency generators, engine test cells, solvent degreasers, boilers, hot water heaters, furnaces, air compressors, and fuel storage tanks; however, boilers, hot water heaters, furnaces, and air compressors are not regulated under the installation's operating permit. Mobile sources (e.g., vehicles, aircraft, portable generators) also emit criteria pollutants but are not regulated under the installation's operating permit. **Table 3-6** summarizes the most recent emissions from stationary and mobile sources at Buckley AFB (BAFB 2010a, CDPHE 2009, and BAFB 2009b).

Table 3-4. Attainment Status for Arapahoe County

Pollutant	Arapahoe County Attainment Status	New Source Review Major Source Thresholds (tpy)	New Source Review Significant Emissions Rates (tpy)
CO	Maintenance – Serious	250	100
Pb	Attainment/Unclassified	250	0.6
NO_2	Attainment/Unclassified	250	40
PM_{10}	Maintenance – Moderate	250	15
$PM_{2.5}$	Attainment/Unclassified	250	15
O_3	Nonattainment – Former Subpart 1	100 (as NO_x or VOC)	40 (as NO_x or VOC)
SO_2	Attainment/Unclassified	250	40

Sources: 40 CFR 81.306, 40 CFR 51.165, 40 CFR 52.21

Table 3-5. Local and Regional Air Emissions Inventory for the Proposed Action (2002)

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Arapahoe County	15,908	20,190	146,558	1,607	12,415	2,730
MDI AQCR	115,373	113,628	764,207	38,244	53,909	13,347

Source: USEPA 2002c

Key: VOC = volatile organic compound; NO_x = nitrogen oxide; tpy = tons per year

Table 3-6. Stationary and Mobile Source Emissions at Buckley AFB

	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_x (tpy)	PM_{10} (tpy)
2009 Stationary Source Actual Emissions	58.62	18.78	19.87	0.99	6.26
Potential to Emit	372.47	64.40	149.23	40.08	22.41
2007 Mobile Source Emissions	70.21	82.86	310.80	2.12	71.64
Total Actual Emissions at Buckley AFB (includes mobile sources)	**128.83**	**101.64**	**330.67**	**3.11**	**77.90**

Sources: BAFB 2010a, CDPHE 2009, and BAFB 2009b

3.4 Geological Resources

3.4.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography and physiography, geology, soils, and, where applicable, geologic hazards and paleontology. 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. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

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

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. 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 soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban developed land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Act also ensures that Federal programs are administered in a manner that, to the extent practicable, will be compatible with private, state, and local government programs and policies to protect farmland.

The implementing procedures of the FPPA and Natural Resources Conservation Service (NRCS) require Federal agencies to evaluate the adverse effects (direct and indirect) of their activities on prime and unique farmland, and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects. Determination of whether an area is considered prime or unique farmland and potential impacts associated with a proposed action is based on preparation of the Farmland Conversion Impact Rating Form (AD-1006) for areas where prime farmland soils occur and by applying criteria established at Section 658.5 of the FPPA (7 CFR 658). The NRCS is responsible for overseeing compliance with the FPPA and has developed the rules and regulations for implementation of the Act (see 7 CFR Part 658, 5 July 1984).

3.4.2 Existing Conditions

Regional Geology. The Buckley AFB area is within the Denver Basin, approximately 50 miles to the east of the Continental Divide. The Denver Basin is a structural depression that is approximately 300 miles long and 200 miles wide and was created during a mountain-building event referred to as the Laramide Orogeny (BAFB 2009a).

The Denver Basin consists of geologic layers in excess of 13,000 feet in thickness that range in age from Late Pennsylvanian through Quaternary. There are five principal stratigraphic units present within the Denver Basin: the Fox Hills Sandstone, Laramie Formation, Arapahoe Formation, Denver Formation, and Dawson Arkose. Surficial material consists of several layers of unconsolidated alluvial gravels, sands, clays, and eolian materials that were deposited from glacial and interglacial events (BAFB 2009b).

Topography. The Buckley AFB area is west of the Great Plains within the western portion of the central high plains of Colorado. The topography of the Buckley AFB area is composed of relatively flat land and rolling upland. Elevations at Buckley AFB range from 5,500 feet above mean sea level (MSL) in the northwestern corner of the installation to 5,650 feet above MSL in the southeastern corner of the installation (BAFB 2009b). The elevation of the areas of the Proposed Action is approximately 5,540 feet above MSL.

Soils. The Proposed Action areas are underlined entirely by the Fondis silt loam, 1 to 3 percent slopes, which is well-drained, has a moderately low to moderately high water capacity, has no potential for flooding or ponding, is not hydric, and has a seasonal water table depth of greater than 80 inches.

Soil engineering limitations were determined based on data available in the NRCS's Web Soil Survey (USDA NRCS 2011). Engineering limitations were considered for construction of small commercial buildings, roads, and shallow excavations for utilities. Fondis silt loam is rated very limited for small commercial building development due to shrink-swell potential; very limited for roads due to low-strength, shrink-swell potential, and frost action; and somewhat limited for shallow excavation due to the presence of clay and the potential for cutback cave-ins.

Prime Farmland. The Proposed Action areas are not considered by the NRCS as prime farmland or farmland of statewide importance because of urban buildup (SCS and CSU ES 1978). The NRCS has determined that Buckley AFB does not have sufficient available space to introduce economically feasible agricultural operations; therefore, no portion of the installation is considered Prime Farmland under the FPPA (Bauckhaus 2001).

Geologic Hazards. Geologic hazards are defined as a natural geologic event that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, landslides, sinkholes, tsunamis, and volcanoes. No major geologic hazards exist for the Buckley AFB area. The U.S. Geological Survey has classified the Buckley AFB area as having a low potential for earthquake hazards. The region of Buckley AFB has a seismic hazard rating of approximately 8 to 16 percent gravity, meaning little or moderate damage to buildings would be expected during an earthquake that has a 2 percent chance of occurring during a 50-year period (USGS 2008).

3.5 Water Resources

3.5.1 Definition of the Resource

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. Water resources relevant to Buckley AFB's location in Colorado

include groundwater, surface water, and wetlands. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

Groundwater. Groundwater is water that exists in the saturated zone beneath the earth's surface, and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations.

Groundwater quality and quantity are regulated under several programs. The Federal Underground Injection Control regulations, authorized under the Safe Drinking Water Act (SDWA), require a permit for the discharge or disposal of fluids into a well. The Federal Sole Source Aquifer regulations, also authorized under the SDWA, protect aquifers that are critical to water supply.

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

A water body can be deemed impaired if water quality analyses conclude that exceedances of the water quality standards established by the CWA occur. The CWA requires that states establish a Section 303(d) list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the source(s) causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a water body without causing impairment. The CWA also mandated the NPDES program, which regulates the discharge of point (end of pipe) and nonpoint (storm water) sources of water pollution and requires a permit for any discharge of pollutants into waters of the United States.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminates that could degrade surface waters. Proper management of storm water flows, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics. Prolonged increases in storm water volume and velocity associated with development and increased impervious surfaces has the potential to impact adjacent streams as a result of stream bank erosion and channel widening or down cutting associated with the adjustment of the stream to the change in flow characteristics. Storm water management systems are typically designed to contain runoff on site during construction, and to maintain predevelopment storm water flow characteristics following development through either the application of infiltration or detention practices. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding.

The USEPA published the technology-based Final Effluent Limitations Guidelines (ELGs) and New Performance Standards for the Construction and Development Point Source Category on 1 December 2009 to control the discharge of pollutants from construction sites. The Rule became effective on February 2010. After this date, all USEPA or state-issued permits were to be revised to incorporate and address the ELG requirements, with the exception of the 280 nephelometric turbidity units (ntu) numeric limitation for turbidity, which has been suspended while the USEPA further evaluates this limitation. The USEPA currently regulates large and small (greater than 1 acre) construction activities through the 2008 CGP, which is scheduled to expire on 30 June 2011. However, the USEPA is in the process of attempting to extend this expiration date until 31 January 2012 in order to give the USEPA more time to evaluate the turbidity effluent limitation and revise the CGP to incorporate the ELG requirements.

Therefore, until such time as the USEPA finalizes the revised CGP to incorporate ELG requirements, all new construction sites are still required to meet the requirements outlined in the 2008 CGP, which include technology-based and water-quality-based effluent limits that apply to all discharges, unless otherwise specified in the CGP. Permittees must select, install, and maintain effective BMPs for erosion and sedimentation control as identified in the 2008 CGP, including the following:

- Sediment controls, such as sediment basins, sediment traps, silt fences, and vegetative buffer strips
- Offsite sediment tracking and dust control
- Runoff management
- Erosive velocity control
- Post-construction storm water management
- Construction and waste materials management
- Nonconstruction waste management
- Erosion control and stabilization
- Spill/release prevention.

Construction activities, such as clearing, grading, trenching, and excavating, disturb soils and sediment. If not managed properly, disturbed soils and sediments can easily be washed into nearby water bodies during storm events, where water quality is reduced. Section 438 of the EISA (42 U.S.C. 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 ft^2 of land. EISA Section 438 requirements are independent of storm water requirements under the CWA. The project footprint consists of all horizontal hard surface and disturbed areas associated with project development. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology shall be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design shall incorporate storm water detention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses shall be conducted to evaluate the effectiveness of the as-built storm water reduction features (DOD 2010a). These regulations have been incorporated into applicable DOD Unified Facilities Criteria (UFC) in April 2010, which stated that LID features would need to be incorporated into new construction activities to comply with the restrictions on storm water management promulgated by EISA Section 438. LID is a storm water management strategy designed to maintain site hydrology and mitigate the adverse impacts of storm water runoff and nonpoint source pollution. LIDs can manage the increase in runoff between pre- and post-development conditions on the project site through interception, infiltration, storage, and evapotranspiration processes before the runoff is conveyed to receiving waters. Examples of the methods include bioretention, permeable pavements, cisterns/recycling, and green roofs (DOD 2010b). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA 2009a).

Wetlands. Wetlands perform several hydrologic functions, including water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the waters of the United States under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats

(including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 329).

3.5.2 Existing Conditions

Groundwater. The Buckley AFB area is within the Denver Basin aquifer system. Four bedrock aquifers, the Denver, Upper Arapahoe, Lower Arapahoe, and Laramie-Fox Hills, underlie the installation (BAFB 2009a). These aquifers are separated by a bed of shale with low permeability and are found in zones of sandstones and siltstones (USGS 1995).

Surficial aquifers at Buckley AFB are associated with present and ancestral surficial stream and river valleys. The aquifer systems (20 to 100 feet thick) are the result of alluvial deposition from erosion of upland bedrock areas. The alluvial aquifer identified on Buckley AFB is associated with East Toll Gate Creek and consists of primarily coarse-grained materials. These aquifer systems are the water source for East Toll Gate Creek, which is the only creek on Buckley AFB. Groundwater is recharged to this aquifer through direct infiltration of precipitation and irrigation water and by lateral and upward seepage of groundwater. Groundwater is discharged from the alluvial aquifer through seepage to streams, evapotranspiration, downward seepage into underlying bedrock aquifers, and extraction via pumping wells. Groundwater flow in these surficial aquifers at Buckley AFB and within the surrounding area is generally in a north-northwesterly direction along the creekbeds, towards the South Platte River north of Denver (BAFB 2009a). There are no sole-source aquifers designated in the State of Colorado (USEPA 2011c).

Surface Water. Surface water resources on and near the Proposed Action areas are scarce. The South Platte River, approximately 15 miles northwest of Buckley AFB, is the primary surface water drainage in the region. Several smaller intermittent tributaries within or adjacent to Buckley AFB feed the South Platte River drainage system.

All surface water drainage on the installation is intermittent resulting from precipitation events in the form of storm water runoff. Most precipitation naturally infiltrates; therefore, discharge of most runoff is due to larger precipitation events or existing ground saturation that occurs during seasonally wetter periods. Runoff discharges are more frequent in the more heavily developed northwestern portion of the installation. Runoff from Buckley AFB is managed by the installation's MS4, a man-made storm water drainage system composed of ditches, curbs and gutters, culverts, pipelines, and detention ponds throughout the installation.

The permitting authority for the regulation of storm water runoff on Federal facilities in the State of Colorado is the USEPA. Buckley AFB's storm water drainage system meets the definition of a regulated MS4 and is covered under NPDES *General Permit for Storm Water Discharges from Federal Facility Small MS4 in Colorado (NPDES Permit No. CO-R042000)* (USEPA undated, USEPA 2003). This permit does not authorize storm water discharges associated with construction activity or industrial activities on Buckley AFB. Discharges related to construction activities are authorized under the USEPA *General Permit for Storm Water Discharges from Construction Activities* (i.e., CGP) when certain eligibility conditions and requirements are met. The CGP is applicable to projects that disturb an area 1 acre or more in size or are part of a larger common plan of development that disturbs an area of 1 acre or more, and requires that a Notice of Intent be obtained by both the contractor doing the construction work and the owner/operator responsible for directing the work, per the definitions in the CGP. Discharges associated with industrial activities on Buckley AFB, including those associated with the Sector L (landfills) and Sector S (air transportation) industries, are permitted under the NPDES *Storm Water Multi-Sector*

General Permit (MSGP) for Industrial Activities Program (USEPA 2003). The MSGP is not applicable to the Proposed Action because it is not associated with either of these industry sectors.

The State of Colorado is the permitting authority for the regulation of storm water runoff occurring outside of Federal facilities. The Colorado storm water regulation (5 Code of Colorado Regulation [CCR] 1002-61) controls storm sewer systems for municipalities and industrial storm water discharges from specific types of industries including construction sites. The City of Aurora has a Phase I MS4 permit, which allows the City to discharge storm water from its municipal storm drainage system.

Surface drainage from Buckley AFB and the surrounding area is generally from southeast to northwest in intermittent drainages. Installation drainage is in either the Sand Creek or the Toll Gate Creek drainage basins. The divide between these basins is southeast-northwest with the Sand Creek drainage basin generally receiving flow from the eastern portion of the installation while the Toll Gate Creek drainage basin receives flow from the western portion. More than half of the installation (approximately 60 percent), including the developed areas such as the ADF-C and most of the airfield operation facilities, is within the Toll Gate Creek basin. Surface drainage from Buckley AFB to the Toll Gate Creek drainage basin can be further divided into either the East Toll Gate Creek subbasin, which includes the southwestern portion of the installation, or the Granby Ditch subbasin, which includes the northwestern portion of the installation.

East Toll Gate Creek crosses the southern part of the installation, and is the only named surface water drainage feature on the installation (see **Figure 3-3**). East Toll Gate Creek is a tributary of Toll Gate Creek, which joins Sand Creek approximately 3.5 miles downstream (northwest of Buckley AFB). Granby Ditch is generally a man-made drainage feature consisting of open channel ditches, vegetated swales, detention basins, and storm sewer pipelines that are part of the City of Aurora's MS4 permitted storm drainage system. Its flows through urbanized portions of the City of Aurora and discharges into Toll Gate Creek approximately 2.7 miles northwest of the installation (BAFB 2009a). Runoff from the Proposed Action would be in the Granby Ditch subbasin.

The most prominent surface water resource on Buckley AFB is Williams Lake, which was created by damming a natural drainage channel that was a tributary to Sand Creek. The primary source of water to Williams Lake is an on-installation water supply well that is supplemented by local storm water runoff from the associated 90-acre watershed (BAFB 2009a). Williams Lake is approximately 1.1 miles east of the Proposed Action.

A drainage ditch of approximately 8,077 ft^2 is within the Proposed Action construction area (see **Figure 3-4**). The drainage ditch is approximately 1,700 feet in length and 4 feet in width at narrower locations and up to approximately 11 feet in width at wider locations. The drainage ditch begins at a flush-mounted storm drain and flows beneath an entrance to an adjacent parking area. Storm water in the drainage ditch flows from the flush-mounted storm drain to the west. The drainage ditch flows to a detention pond that discharges to Granby Ditch, which eventually discharges into Toll Gate Creek.

Sand Creek and tributaries to South Platte River (Chatfield Reservoir to Big Dry Creek except specific listings), which includes East and West Toll Gate Creeks, are included in the 2010 "Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List," 5 CCR 1002-93, Regulation #93. East and West Toll Gate Creeks and Sand Creek are identified by the State of Colorado as impaired due to selenium, and Sand Creek is also designated as impaired due to *Escherichia coli* (*E. coli*). This segment of Sand Creek designated as impaired includes the portion north of Buckley AFB. A TMDL will be developed for these streams at some point in the future. TMDL development for selenium at East and West Toll Gate Creeks and Sand Creek are assigned a low priority; however, TMDL development for *E. coli* at Sand Creek is identified as a high priority (CDPHE-WQCD 2010).

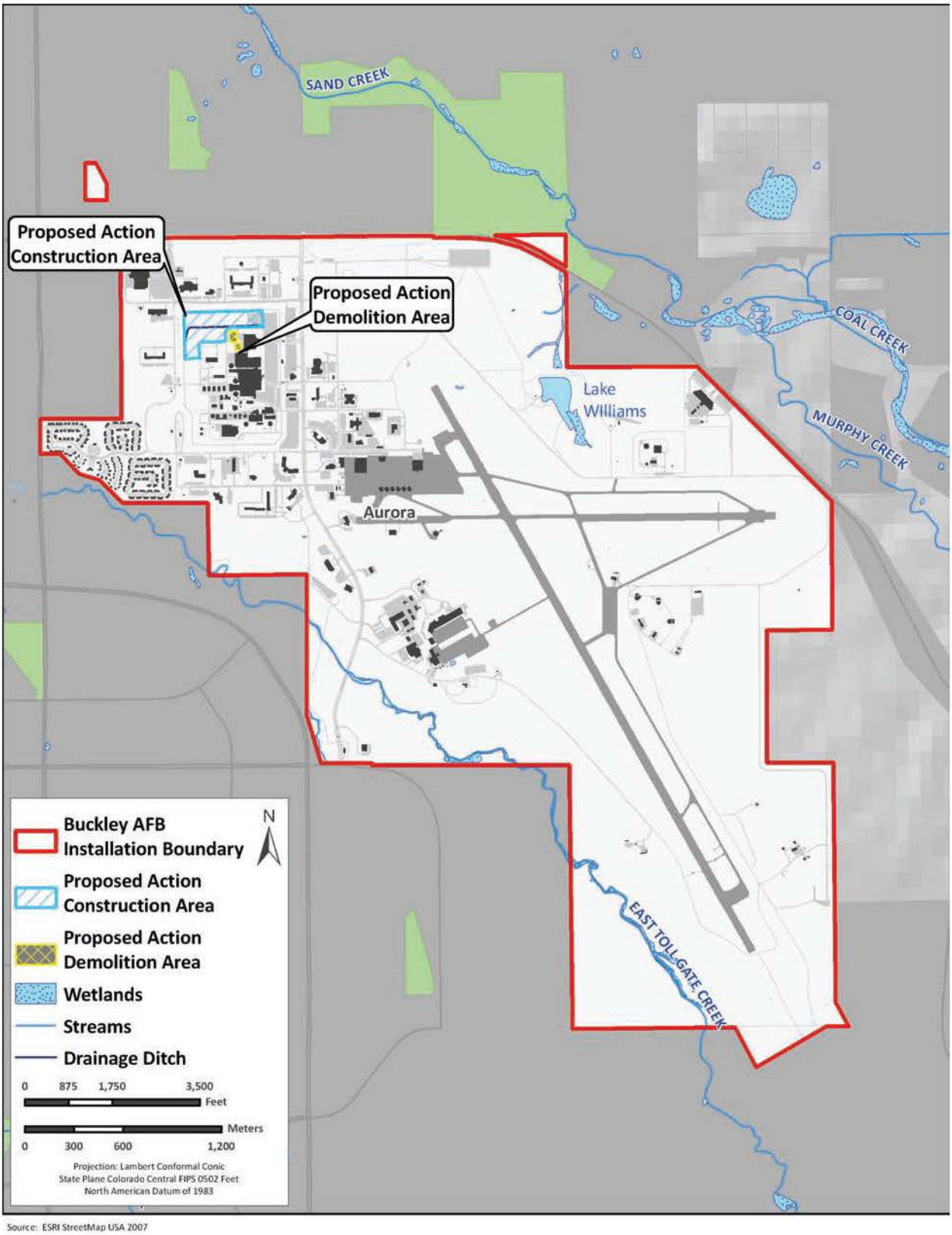

Figure 3-3. Major Water Features in the Vicinity of Buckley AFB

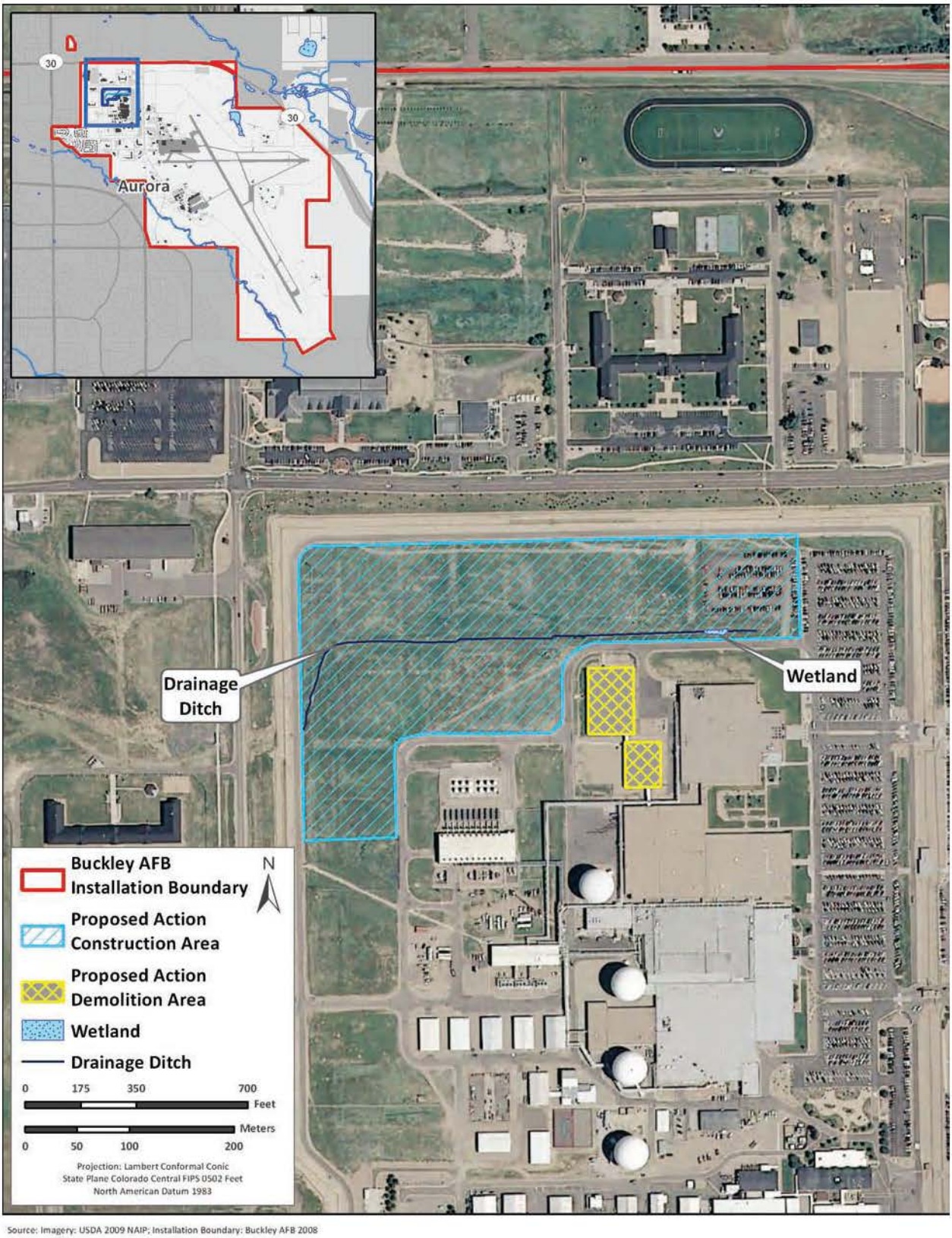

Figure 3-4. Drainage Ditch and Wetland at the Proposed Action Construction Area

Identification on the 303(d) list is based on the state's assessment of water quality conditions for all uses designated for an individual water body. A status of "impaired" means water quality conditions either are not supporting or are partially supporting for one or more of the designated water uses. For East and West Toll Gate Creeks, the designated uses and corresponding attainment status are as follows:

Agriculture – fully supporting

- Aquatic Life Warm, Class 2 – not supporting
- Primary Contact Recreation – fully supporting.

For the Sand Creek, the designated use and corresponding attainment status are as follows:

- Agriculture – fully supporting
- Aquatic Life Warm Water, Class 2 – not supporting
- Primary Contact Recreation – not supporting (CDPHE-WQCD 2010).

Wetlands. The USAF complies with EO 11990, *Protection of Wetlands*, primarily by avoiding new construction in areas impacting wetlands, and secondarily by minimizing impacts on wetlands when construction is the only practicable alternative. A wetland area of approximately 220 ft^2 is within the Proposed Action construction area on Buckley AFB (see **Figure 3-4**). The wetland is isolated, nonjurisdictional (McKee 2010), associated with a storm water conveyance system (culvert outflow), and occurs within the channel banks of a drainage ditch. See **Section 3.6** for more information on wetlands.

3.6 Biological Resources

3.6.1 Definition of the Resource

Vegetation and Wildlife. Biological resources include native or naturalized plants and animals, and the habitats, such as wetlands, forests, and grasslands, in which they exist.

Protected and Sensitive Species. Protected and sensitive biological resources include federally listed (threatened or endangered), proposed, and candidate species, and designated or proposed critical habitat; species of concern managed under Conservation Agreements or Management Plans; and state-listed species.

The Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.) specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure an action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of critical habitat for these species, unless the agency has been granted an exception. The Secretary of the Interior, using the best available scientific data, determines which species are officially threatened or endangered.

Wetlands. Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat, and erosion protection.

Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically

adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

The USACE is responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA, which authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands. In addition, Section 404 of the CWA also grants states with sufficient resources the right to assume these responsibilities. The USACE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899. NRCS has developed procedures for identifying wetlands for compliance with the Food Security Act of 1985, and the National Wetlands Inventory has developed a classification system for identifying wetlands. Through the National Wetlands Inventory, the U.S. Fish and Wildlife Service (USFWS) is the principal Federal agency that provides information to the public on the extent and status of wetlands.

Section 401 of the CWA gives the state board and regional boards the authority to regulate through water quality certification any proposed federally permitted activity that could result in a discharge to water bodies, including wetlands.

EO 11990 requires that Federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

3.6.2 Existing Conditions

Vegetation. The Buckley AFB area is in the Central Shortgrass Prairie Ecoregion. Typically, Buckley AFB is described in terms of two major ecological systems: Western Great Plains Shortgrass Prairie and Rocky Mountain Lower Montane Riparian Woodland and Shrubland. The distribution of ecological systems found on Buckley AFB is defined by the drainages of the installation and limited by the developed and disturbed portions of the installation (BAFB 2011b).

The shortgrass prairie at Buckley AFB is dominated by blue grama grasses (*Bouteloua gracilis*) and associated native graminoid species including buffalograss (*Buchloe dactyloides*), needle and thread grass (*Hesperostipa comata*), prairie Junegrass *(Koeleria macrantha*), western wheatgrass (*Pascopyrum smithii)*, sand dropseed (*Sporobolus cryptandrus*), sideoats grama (*Bouteloua gracislis*), and salt grass (Distichlis spicata). There are a number of exotic species present in this system including crested wheatgrass (*Agropyron cristatum*), smooth brom (*Bromus inermis*), cheatgrass (*Bromus tectorum*), Kentucky bluegrass (*Poa pratensis*), allysum (*Allysum parviflorum*), and rye grass (*Secale cereale*), among others (BAFB 2011b).

The Proposed Action construction area on Buckley AFB is mapped as crested wheatgrass (*Agropyron cristatum*), and has been disturbed by construction, demolition, and the presence of prairie dogs (BAFB 2009b). Crested wheatgrass is a nonnative grass species historically used to revegetate disturbed ground. The wetland in the Proposed Action construction area is associated with a storm water conveyance system and occurs within the ditch channel banks. Dominant vegetation within the palustrine emergent wetland includes coyote willow (*Salix exigua*), cattail (*Typha latifolia*), and curly dock (*Rumex crispus*). The remainder of the Proposed Action construction area consists of lawn and landscaped areas invaded by prairie dogs and developed land.

The Proposed Action demolition area (NSAC facility) consists of two buildings with no vegetation. The temporary contractor parking area is an open, grass-covered area.

Wildlife. The shortgrass prairie community supports numerous bird species, many of which are groundnesters. The most common songbirds inhabiting prairies include western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), lark bunting (*Calamospiza melanocorys*), killdeer (*Charadrius vociferous*), black billed magpie (*Pica pica*), mourning dove (*Zanaida macroura*), western kingbird (*Tyrannus verticalis*), and eastern kingbird (*Tyrannus tyrannus*).

Raptor species known or likely to occur at Buckley AFB include burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamacensis*), prairie falcon (*Falco mexicanus*), and American kestrel (*Falco sparverius*). Additionally, bald eagles (*Haliaeetus leucocephalus*), ferruginous hawks (*Buteo regalis*) and rough-legged hawks (*Buteo lagopus*) might be observed in the winter.

Several amphibian and reptilian species occur on Buckley AFB. From May through September 2010, an *Amphibian and Reptile Survey* was conducted at Buckley AFB. Eleven species of amphibians, snakes, lizards, fish, snails, and amphipods were found during the survey. Because the aquatic habitats at Buckley AFB are limited to Williams Lake and to the ephemeral pools of the intermittent stream, East Toll Gate Creek, only two amphibian species were found. Six reptile species were found, but relatively few individuals were found with some reptiles documented by the observation of a single individual. Species with high potential to occur at Buckley AFB, but that were not documented, include the tiger salamander (*Ambystoma tigrinum*), Woodhouse's toad (*Bufo woodhousii*), lesser earless lizard (*Holbrookia maculate*), racer (*Coluber constrctor*), western hognose snake (*Heterodon nasicus*), northern water snake (*Nerodia sipedon*), gopher snake (*Pituophis catenifer*), and plains black-headed snake (*Tontilla nigripes*) (BAFB 2011b).

Small mammals observed at Buckley AFB include rodents and lagomorphs (rabbits). The most widely observed small mammal is the black-tailed prairie dog (*Cynomys ludovicianus*). Prairie dogs are considered keystone species as they support a diverse array of other plant and wildlife species within their colonies. Other rodents known to inhabit Buckley AFB include plains pocket gopher (*Geomys bursarius*), thirteen lined ground squirrel (*Spermophilus tridecemlineatus*), fox squirrel (*Sciurus niger*), deer mouse (*Peromyscus maniculatus*), and prairie vole (*Microtus ochragaster*). Common lagomorphs include black-tailed jackrabbit (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendi*), eastern cottontail (*Sylvilagus floridanus*), and desert cottontail (*Sylvilagus auduboni*) (BAFB 2009b).

No ungulates (mammals with hooves) occur on the installation due to the exclusion fencing around the perimeter, although pronghorn (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*) formerly occurred on the installation and still inhabit surrounding properties (BAFB 2004b). Carnivores inhabiting Buckley AFB include red fox (*Vulpes vulpes*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and long-tailed weasel (*Mustela frenata).* Domestic and feral cats and dogs also occur.

Protected and Sensitive Species. Threatened or endangered plant and animal species are protected under the Federal ESA of 1973 as amended (16 U.S.C. 1531 et seq.) and the Colorado Division of Wildlife (CDOW) State Wildlife Act (SWA) of 1985 as amended (§§ 33-1-101 to 33-6-2-104) Chapter 10-Nongame Wildlife Regulation, revised 17 November 2004. According to the ESA of 1973, endangered species are defined as any species in danger of extinction throughout all or a significant portion of its range; a threatened species is one that is likely to become endangered in the foreseeable future. Other sensitive species are protected by Colorado state law and include those listed by the CDOW

as species of special concern. Special concern species receive no formal protection, but are still considered when assessing potential project impacts.

Federal- and Colorado state-listed species are shown in **Table 3-7**. A number of species that either lack suitable habitat, or would not be impacted by any proposed activities, are not discussed further. These species include the interior least tern (*Sternula antillarum*), Mexican spotted owl (*Strix occidentalis lucida*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), Ute ladies'-tresses orchid (*Spiranthes diluvialis*), and Colorado butterfly plant (*Gaura neomexicana coloradensis*), which are unlikely to occur at the Proposed Action areas. The USFWS has designated the Buckley AFB area as being within a "block clearance zone" that does not support the black-footed ferret (*Mustela nigripes*) or Preble's meadow jumping mouse (*Zapus hudsonius preblei*), and it is therefore assumed that these species do not occur on the installation. Therefore, the Proposed Action would have no effect on these species, and they are not discussed further in this EA.

The only protected species that is known to occur and have resident populations on Buckley AFB is the burrowing owl. It is a state-listed threatened species.

The category "species of special concern" carries no legal requirement but identifies those species that deserve special consideration in management and planning. **Table 3-8** lists the species of special concern in Colorado. The only species of special concern that is known to occur and have resident populations on Buckley AFB is the black-tailed prairie dog (*Cynomys ludovicianus*).

The loggerhead shrike (*Lanius ludovicianus*) is not a Federal- or state-listed species of concern; however, it is very important to the shortgrass prairie ecosystem that encompasses Buckley AFB. The USFWS designated the loggerhead shrike as a Migratory Nongame Bird of Management Concern in the United States in 1987 due to rangewide declines in populations. Additionally, in the Colorado Wildlife Management Plan prepared by the CDOW, the loggerhead shrike was listed as a primary tier 1 species of greatest conservation need (high priority) for shortgrass prairie.

Two of the reptile species found at Buckley AFB are tracked as sensitive species by the Colorado Natural Heritage Program, the northern many-lined skink (*Plestiodon multivirgatus multivirgatu*) and the lined snake (*Tropidoclonion lineatum*). The Colorado Natural Heritage Program ranks the northern many-lined skink as apparently secure in Colorado (S4) and the lined snake as vulnerable (S3). Globally, both species are demonstrably secure (G5) and are four and three rank levels, respectively, removed from G1 (critically imperiled) and G2 (imperiled) species discussed in the DOD species at risk reported on by NatureServe. The northern leopard frog, designated by the CDOW as a state species of "special concern" (Heritage Rank G5S3), was not found on the installation (BAFB 2011b).

Wetlands. HDR conducted field investigations on 15 October 2010, to determine the extent of jurisdictional wetlands and other waters of the United States at the Proposed Action construction area on Buckley AFB. The man-made drainage ditch in the Proposed Action construction area has an associated wetland habitat at the east terminus of the upland drainage ditch. The wetland habitat identified in the assessment area was classified based on the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) as a palustrine emergent wetland. The total area of wetland habitat is approximately 220 ft^2 (0.005 acres). The isolated, nonjurisdictional (McKee 2010) wetland is of low value, primarily supported by irrigation, and present due to lack of maintenance of the man-made drainage feature and outfall. There are no wetland areas within the Proposed Action demolition area or the temporary contractor parking area.

Table 3-7. Federal- and State-Listed Species in Arapahoe County, Colorado

Common Name (*Scientific Name*)	Habitat Preferences	Status (USFWS/ CDOW)
BIRDS		
Burrowing owl (*Athene cunicularia*)	Primarily found in grasslands and mountain parks, usually in or near prairie dog towns; also uses well-drained, steppes, deserts, prairies, and agricultural lands.	NL/T
Interior least tern (*Sternula antillarum*)	Sandy/pebbly beaches, inland river sandbars for nesting and shallow water for foraging.	E/E
Mexican spotted owl (*Strix occidentalis lucida*)	Lower elevation forests mostly in deeply incised, rocky canyons; complex forest structures that contain uneven-aged, multi-level and old-aged, thick forests.	T/T
Piping plover (*Charadrius melodus*)	Sandy lakeshore beaches, sandbars within riverbeds, and sandy wetland pastures; all of which must be sparsely vegetated.	T/T
Whooping crane (*Grus americana*)	Breed and nest along lake margins or among rushes and sedges in marshes and meadows. Winter on estuarine marshes, shallow bays, and tidal salt flats. Prefer sites with minimal human disturbance.	E/E
MAMMALS		
Black-footed ferret (*Mustela nigripes*)	Closely associated with prairie dog habitat; uses prairie dog burrows for nesting and prairie dogs are a primary food source.	E/E
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	In and near densely vegetated, shrub-dominated riparian areas.	T/T
PLANTS		
Colorado butterfly plant (*Gaura neomexicana coloradensis*)	Sub-irrigated, alluvial soils of drainage bottoms surrounded by mixed grass prairie; elevation 5,800–6,200 feet.	T/R/S1
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Open wetland and riparian areas with permanent sub-irrigation; early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbly edges.	T/R/S2

Sources: USFWS 2010, BAFB 2009b

Note: * The USFWS has designated the Buckley AFB area as being within a "block clearance zone" that does not support these species

Key:

E: Federally or state-listed endangered species
T: Federally or state-listed threatened species
P: Proposed
R: State-listed as rare
S1: Critically endangered in state
S2: Endangered or threatened in state

Table 3-8. Colorado Division of Wildlife Species of Concern

Common Name	Scientific Name
AMPHIBIANS	
Northern cricket frog	*Acris crepitans*
Great Plains narrowmouth toad	*Gastrophryne olivacea*
Northern leopard frog	*Rana pipiens*
Wood frog	*Rana sylvatica*
Plains leopard frog	*Rana blairi*
Couch's spadefoot	*Scaphiopus couchii*
REPTILES	
Triploid checkered whiptail	*Cnemidophorus neotesselatus*
Midget faded rattlesnake	*Crotalus viridis concolor*
Longnose leopard lizard	*Gambelia wislizenii*
Yellow mud turtle	*Kinosternon flavescens*
Common king snake	*Lampropeltis getula*
Texas blind snake	*Leptotyphlops dulcis*
Texas horned lizard	*Phrynosoma cornutum*
Roundtail horned lizard	*Phrynosoma modestum*
Massasauga	*Sistrurus catenatus*
Common garter snake	*Thamnophis sirtalis*
BIRDS	
Bald eagle	*Haliaeetus leucocephalus*
Western yellow-billed cuckoo	*Coccyzus americanus*
Greater sandhill crane	*Grus canadensis tabida*
Ferruginous hawk	*Buteo regalis*
Gunnison sage-grouse	*Centrocercus minimus*
American peregrine falcon	*Falco peregrinus anatum*
Greater sage grouse	*Centrocercus urophasianus*
Western snowy plover	*Charadrius alexandrinus*
Mountain plover	*Charadrius montanus*
Long-billed curlew	*Numenius americanus*
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*
MAMMALS	
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Black-tailed prairie dog	*Cynomys ludovicianus*
Botta's pocket gopher	*Thomomy bottae rubidus*
Northern pocket gopher	*Thomomys talpoides macrotis*
Swift fox	*Vulpes velox*

Source: CDOW 2010

3.7 Cultural Resources

3.7.1 Definition of the Resource

"Cultural resources" is an umbrella term for many heritage-related resources defined in various laws and EOs. These Federal cultural resources laws and regulations include the National Historic Preservation Act (NHPA) of 1966, as amended (Public Law 89-665; 80 STAT.915; 16 U.S.C. 47), the Archeological and Historic Preservation Act (AHPA) of 1974 (Public Law 93-291 and 16 U.S.C. 469-469c), the American Indian Religious Freedom Act (AIRFA) of 1978 (Public Law 950341, 42 U.S.C. 1996 and 1996a), the Archaeological Resources Protection Act (ARPA) of 1979 (Public Law 96-95 and amendments, 16 U.S.C. 470aa-470mm), and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (Public Law 101-601, 25 U.S.C. 3001).

The NHPA focuses on cultural resources such as prehistoric and historic sites, structures, districts, or any physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or other reason. Such resources might provide insight into the cultural practices of previous civilizations or retain cultural and religious significance to modern groups. Resources judged important under the NHPA are eligible for listing in the National Register of Historic Places (NRHP). These are termed "historic properties" and are provided protection under the NHPA.

NAGPRA requires consultation with culturally affiliated Native American tribes for the disposition of Native American human remains, burial goods, objects of patrimony, and cultural items of Native American affiliation recovered from federally owned or controlled lands.

Typically, cultural resources are subdivided into archaeological resources, architectural resources, and traditional cultural properties (TCPs). Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., projectile points and bottles).

Architectural resources are buildings or other structures or groups of structures, or designed landscapes that are of historic, aesthetic, or scientific significance. These include standing buildings, bridges, dams, and other structures. Generally, architectural resources must be more than 50 years old to be considered for the NRHP. More recent structures, such as Cold War-era resources, might warrant protection if they are of exceptional importance or if they have the potential to gain significance in the future.

TCPs are resources of traditional, religious, or cultural significance to Native American tribes. These resources can include archaeological sites, sacred sites, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans consider essential for the preservation of traditional culture. A TCP contains an intangible cultural element that is associated with a specific geographic location. Federal land managers are to consult with tribes that attach religious and cultural significance to cultural properties that could be affected by an undertaking, per 36 CFR 800.2(c)(2)(ii).

USAF installations are mandated to comply with Sections 106 and 110 of the NHPA, NAGPRA, and other legal mandates for each action, project, or activity (undertaking) for which an installation is directly or indirectly responsible. AFI 32-7065, paragraph 1.4.8 directs installation commanders to establish government-to-government relationships with federally recognized Native American tribes and to consult with tribes on all undertakings. An installation's Cultural Resources Manager is responsible for reviewing all projects for compliance with cultural resources laws and policies.

DOD facilities are required to comply with DOD Instruction 4715.5 and DOD Instruction 4715.05-G, which direct commanders to "manage and maintain cultural resources under DOD control in a

sustainable manner through a comprehensive program that considers the preservation of historic, archaeological, architectural, and cultural values; is mission supporting; and results in sound and responsible stewardship."

The EA process requires assessment of the potential impact of a Federal action on cultural resources. The consultation process prescribed in Section 106 of the NHPA requires a determination of the effect of a Federal undertaking on historic properties within the Area of Potential Effect (APE). The APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Sections 106 and 110 of the NHPA, Federal agencies are required to inventory all cultural resources under their purview on federally owned, leased, or managed property and evaluate their eligibility for inclusion in the NRHP. The Federal agency official evaluates the NRHP eligibility and assesses potential effects of an undertaking on historic properties in consultation with the SHPO and relevant federally recognized Native American tribes. If historic properties could be affected by the undertaking, the Federal agency official is required to comply with all requirements outlined in 36 CFR Part 800 and with directives in AFI 32-7065.

3.7.2 Existing Conditions

The APE includes all of the areas of the Proposed Action, including the Proposed Action construction area, Proposed Action demolition area (NSAC facility), and the temporary contractor parking area.

The *460th Space Wing Integrated Cultural Resources Management Plan* (ICRMP) (BAFB 2006a) describes the results of 14 archaeological and architectural inventories conducted at Buckley AFB between 1983 and 2004. With the exception of approximately 150 acres within the ADF-C, all of Buckley AFB has been inventoried for cultural resources. Six buildings, all dating to the Cold War era, have been determined by Buckley AFB, with the concurrence of the Colorado SHPO, as individually eligible for the NRHP. These buildings are identified and described as follows:

- Building 801 (5AH.2274) is a double-bay, arched concrete hangar built for the Navy in 1953. It is eligible for inclusion in the NRHP under Criterion A for its Cold War history and under Criterion C for architectural significance as an unusual type of Navy hangar. Building 801 is not near the Proposed Action.
- Building 909 (5AH.2276) is a steel-truss, low-gable hangar built in 1956 for Colorado Air National Guard jet aircraft and the Air National Guard's only precision-flying team, the Minute Men. It is eligible for inclusion in the NRHP under Criterion A for its significant association with Cold War-era history. Building 909 is not near the Proposed Action.
- Buildings 402, 403, 404, and 405 are satellite communications ground terminals (radomes) (exteriors only) constructed between 1970 and 1976 (5AH.2322, 2288, 2289, and 2333, respectively). They are eligible for inclusion in the NRHP under Criterion C for architectural significance as excellent examples of radome construction and under Criterion A for their significant association with Cold War-era history. These radomes are inside of the ADF-C, and the nearest is less than 400 feet to the south of the existing NSAC facility.

In addition to Buildings 402, 403, 404, and 405, Buckley AFB has several other radomes that loom above the Denver-Aurora metropolitan area horizon as giant "golf balls" and establish Buckley AFB's identity on Aurora's plains and urban landscape. However, Buildings 402, 403, 404, and 405 are particularly significant given their height (85 feet), age, and location on the more urban west side of the installation. Under Section 106 of the NHPA, visual effects on historic properties are considered as adverse effects if there is a change to the setting that might diminish a property's use or that introduces visual elements

that would diminish the integrity of a property's significant historic features or setting (36 CFR 800.5(a)(2)(iv), (v)).

No archaeological sites eligible for inclusion in the NRHP have been documented at Buckley AFB. As noted, the entire installation has been surveyed for archaeological resources except for approximately 150 acres within the ADF-C. A survey within the ADF-C was conducted in 2004 at the Proposed Action construction area and the existing NSAC facility. This survey concluded that the area was previously disturbed and lacked archaeological potential (OAHP 2004).

No Native American sacred sites or TCPs are known at Buckley AFB at this time. No Native American human remains or objects of patrimony have been discovered or reported at Buckley AFB. Government-to-government consultation between Buckley AFB and federally recognized Native American tribes has been initiated and is ongoing on a general basis.

Intact cultural resources are not expected to be within the off-base portion of the proposed electric feeder line because the proposed route is within existing easements that have been previously disturbed.

To protect the historic properties described and any resources that might be discovered in the future, cultural resources management goals and objectives have been identified for implementation in the ICRMP for Buckley AFB. The Buckley AFB ICRMP sets out a series of Standard Operating Procedures (SOPs) using the NEPA process for Section 106 compliance purposes when an EA or EIS is required. The SOPs also set forth appropriate actions to be taken when a cultural resource is identified to guarantee appropriate handling and consultation to preserve the resource.

A determination of no adverse effect from the Proposed Action on the four NRHP-eligible radomes (Buildings 402 through 405) was submitted to the Colorado SHPO on 6 June 2011 for review and concurrence (see **Appendix B**). The response letter from the Colorado SHPO, dated 15 June 2011, concurred with the Proposed Action APE and the recommended finding that the Proposed Action would have "no adverse effect" on the four NRHP-eligible radomes under Section 106 of the NHPA (**see Appendix B**). Based on the current condition of the land and historical land use within the Proposed Action APE, consultation on Native American sacred sites is not anticipated.

3.8 Socioeconomic and Environmental Justice

3.8.1 Definition of the Resource

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

Employment and economic data provide key insights into socioeconomic conditions that might be affected by a proposed action. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial or commercial growth or growth in other sectors provide baseline and trend line information about the economic health of a region. In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and jobs base.

Demographics identify the population levels and changes to population levels of a region. Demographics data might also be obtained to identify, as appropriate to evaluation of a proposed action, a region's characteristics in terms of race, ethnicity, poverty status, and other broad indicators.

Socioeconomic data shown in this section are presented at county and state levels to characterize baseline socioeconomic conditions in the context of regional and state trends. Data have been collected from previously published documents issued by Federal, state, and local sources.

The geographical area in which a majority of the socioeconomic effects of the action and alternatives would occur is defined as the Region of Influence (ROI). The ROI is considered a primary effect area because it receives direct and indirect economic benefits from installation operations due to residency distribution of installation employees, commuting distances and times, and the locations of businesses providing goods and services to installation personnel and their dependents. Other criteria include regional economic activity, population, housing, and schools.

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), requires that Federal agencies' actions substantially affecting human health or the environment not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

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

Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EOs.

For the purposes of this EA, minority and low-income populations are defined as follows:

- Minority Population: Black or African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; or some other minority race. The U.S. Census Bureau considers race and Hispanic origin (ethnicity) as two separate concepts and these data are recorded separately. For the purposes of this analysis, the total minority population would include racial minority populations and Hispanic or Latino populations within the ROI.
- Low-income Population: Persons living below the poverty level, according to income data collected in the 2000 U.S. Census.

3.8.2 Existing Conditions

The areas of the Proposed Action are in the City of Aurora within northwestern Arapahoe County. For the purposes of this EA, the socioeconomic and environmental justice ROI is defined as census tracts 70.08, 71.02, 83.03, 83.09, and 83.53 (see **Figure 3-5**).

Demographics. In FY 2009, Buckley AFB supported a population of 92,039 people, including on- and off-installation active-duty military personnel, National Guard and Reserve personnel, civilian employees, contractors, retirees, veterans, and dependents. This figure includes approximately 7,100 military personnel (including 3,100 active-duty personnel) and 4,900 civilian employees and contractors. In addition, the installation supports 1,200 dependents that live on Buckley AFB (Spann 2011). Retirees, veterans, and dependents that live off-installation comprise the remainder of the population supported by Buckley AFB.

The population of the ROI in 2000 was 26,347 (U.S. Census Bureau 2000a). While population estimates from 2009 are not available for census tracts, the populations of Adams and Arapahoe counties and the City of Aurora, which contain portions of the ROI, each increased by more than 15 percent from 2000 to 2009. From 2000 to 2009, the populations of Adams and Arapahoe counties grew by 21.1 percent and 15.9 percent, respectively, while the City of Aurora grew by 17 percent. This population growth trend is also reflected in the populations of Colorado and the Denver-Aurora-Broomfield, Colorado, Metropolitan Statistical Area (MSA), which increased 16.8 percent and 17.1 percent, respectively, from 2000 to 2009. The Denver-Aurora-Broomfield, Colorado, MSA includes Adams and Arapahoe counties and eight other counties in the Denver area (i.e., Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park). See **Table 3-9** for year 2000 population data and year 2009 population estimate data.

Table 3-9. Year 2000 Population Data and Year 2009 Population Data Estimate

Location	2000	2009 (Estimated)[1]	Percentage Change
United States	281,421,906	307,006,550	9.1%
Colorado	4,301,261	5,024,748	16.8%
Denver-Aurora-Broomfield, Colorado, MSA	2,179,240	2,552,195	17.1%
Adams County	363,857	440,994	21.2%
Arapahoe County	487,967	565,360	15.9%
City of Aurora	276,393	323,348	17.0%
ROI	26,347	NA	NA
Census Tract 70.08	*6,242*	*NA*	*NA*
Census Tract 71.02	*3,619*	*NA*	*NA*
Census Tract 83.03	*8,822*	*NA*	*NA*
Census Tract 83.09	*3,052*	*NA*	*NA*
Census Tract 83.53	*4,612*	*NA*	*NA*

Sources: U.S. Census Bureau 2000b, U.S. Census Bureau 2009, U.S. Census Bureau 2010

Notes:

1. Population estimates are not available for census tracts.
2. The Denver-Aurora-Broomfield, Colorado, MSA includes Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park counties in Colorado.

Key: NA = Not Available

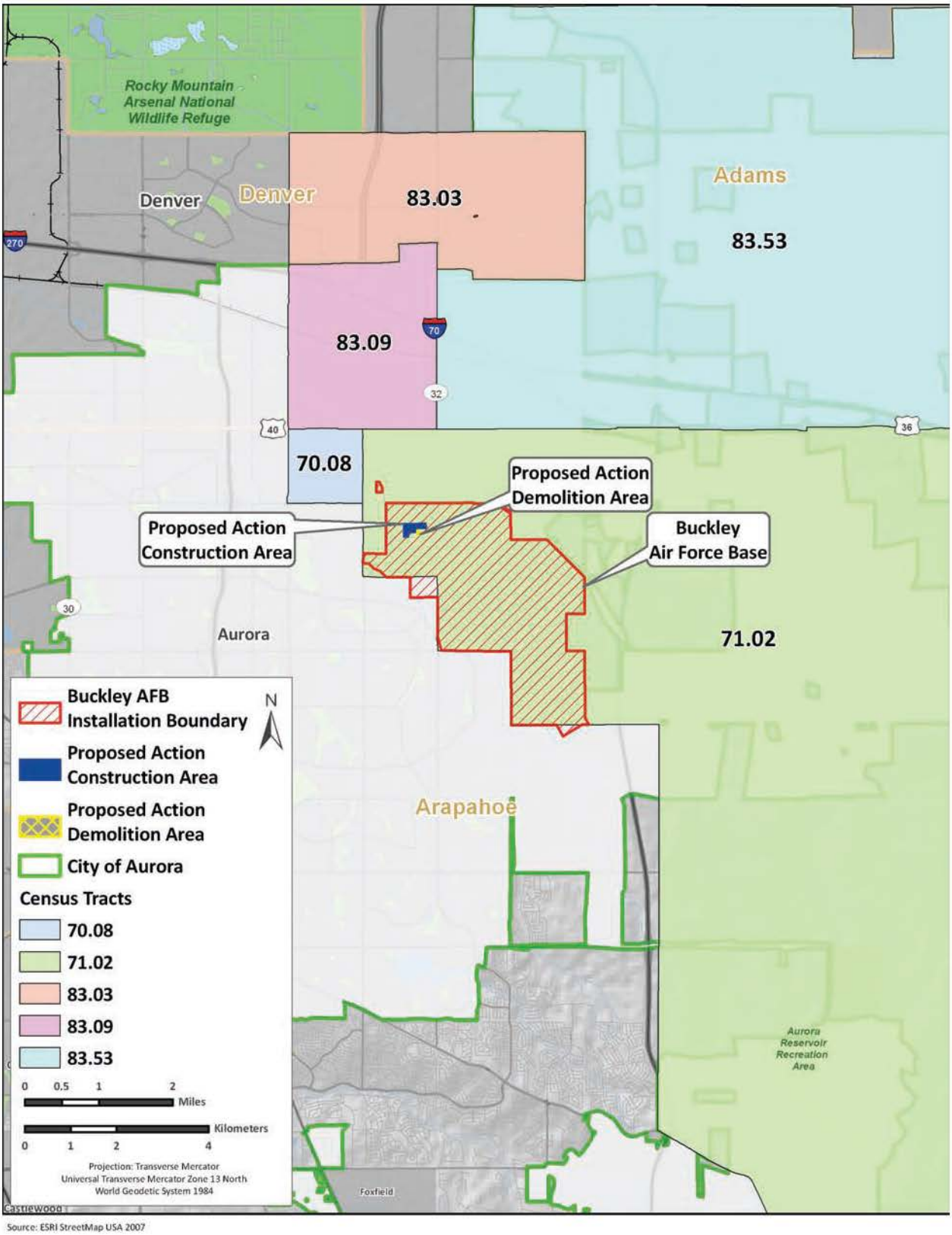

Figure 3-5. Census Tracts in the Vicinity of Buckley AFB

Economy and Housing. In 2010, Buckley AFB was the largest public employer in the City of Aurora (AEDC 2010). More than 13,000 military and civilian personnel and contractors work at the installation with an annual payroll of more $600 million. Through support jobs within the surrounding community and contracts, Buckley AFB is estimated to indirectly create an additional 5,790 jobs with a value of approximately $295 million. Based on the value of the installation payroll, contract expenditures, and job creation, Buckley AFB contributed more than $1 billion ($1.044 billion) during FY 2009 to the local economy (Spann 2011, BAFB 2009c).

In 2000, there was a larger percentage of persons employed in the Armed Forces in the ROI than there was in the City of Aurora, Adams and Arapahoe counties, and the State of Colorado (see **Table 3-10**). The largest employment type in the ROI, the City of Aurora, Adams and Arapahoe counties, and the State of Colorado is educational, health, and social services. The second largest employment type in the ROI is transportation and warehousing, and the third largest is utilities and retail trade. Retail trade represented the second largest employment type in the City of Aurora, Adams and Arapahoe counties, and the State of Colorado (U.S. Census Bureau 2000b).

Table 3-10. Percentage of Employment Types (2000[1])

Economic and Social Indicators	ROI	City of Aurora	Adams County	Arapahoe County	State of Colorado
Percent persons in the Armed Forces (16 years old and older in the Labor Force[2])	1.7	1.0	0.2	0.7	1.2
Percent Employed Persons 16 years old and older in Civilian Labor Force (by industry)					
Agriculture, forestry, fishing and hunting, and mining	0.8	0.5	0.9	0.7	2.0
Construction	8.6	8.4	11.3	7.2	9.1
Manufacturing	8.0	7.0	12.0	6.7	9.1
Wholesale trade	5.1	4.6	5.6	4.2	3.5
Retail trade	11.0	12.4	12.3	12.1	11.8
Transportation and warehousing, and utilities	12.8	7.4	8.1	5.6	4.9
Information	4.9	6.7	4.9	7.4	4.9
Finance, insurance, real estate, and rental and leasing	8.6	10.6	6.4	11.4	7.7
Professional, scientific, management, administrative, and waste management services	9.7	11.6	10.2	13.2	11.7
Educational, health and social services	12.9	13.9	12.7	15.7	17.0
Arts, entertainment, recreation, accommodation and food services	6.1	7.4	7.1	6.9	9.0
Other services (except public administration)	3.9	4.9	4.8	4.7	4.8
Public administration	7.5	4.5	3.7	4.1	4.6

Source: U.S. Census Bureau 2000b

Notes:

1. The 2000 U.S. Census data are the most recent employment data for the ROI (census tracts).
2. Labor force includes persons that are employed or unemployed civilians and members of the armed forces.

As of December 2010, the unemployment rates (not seasonally adjusted) for Colorado and the Denver-Aurora-Broomfield, Colorado, MSA were 8.7 percent and 8.6 percent, respectively (CDLE 2011). The total civilian labor force of the Denver-Aurora-Broomfield, Colorado, MSA in December 2010 was 1,372,396, and the 2009 Gross Domestic Product of Colorado was approximately $252.7 billion (CDLE 2011, BEA 2010). It was estimated that there were 676,591 housing units in Adams, Arapahoe, and Denver counties in 2009 (U.S. Census Bureau 2010).

Environmental Justice Characteristics. Based on 2000 U.S. Census data, the population of the ROI was 26,347 (U.S. Census Bureau 2000a). In 2000, 36.1 percent of the population within the ROI was within a racial minority (race other than white alone) and 18.3 percent were of Hispanic or Latino origin (see **Table 3-11**) (U.S. Census Bureau 2000a). When compared to the City of Aurora, which encompasses Buckley AFB and the surrounding area, the ROI had a slightly higher percentage of residents reporting to be of a racial minority (36.1 percent vs. 31.16 percent), but a slightly lower percentage of Hispanic or Latino residents (18.3 percent vs. 19.8 percent).

Table 3-11. Minority and Low-Income Data (2000[1])

	ROI	**City of Aurora**	**Adams County**	**Arapahoe County**	State of Colorado
Total Population	**26,347**	**276,393**	**363,857**	**487,967**	**4,301,261**
Percent Male	50.4	49.5	50.7	49.3	50.4
Percent Female	49.6	50.5	49.3	50.7	49.6
Percent Under 5 Years	9.5	8.1	8.4	6.9	6.9
Percent Over 65 Years	4.8	7.4	7.8	8.6	9.7
Percent White	63.9	68.9	77.3	79.9	82.8
Percent Black or African American	18.5	13.4	3.0	7.7	3.8
Percent American Indian Alaska Native	1.1	0.8	1.2	0.7	1.0
Percent Asian	3.1	4.4	3.2	3.9	2.2
Percent Native Hawaiian and Other Pacific Islander	0.3	0.2	0.1	0.1	0.1
Percent Some Other Race	8.1	8.1	11.7	4.5	7.2
Percent Reporting 2 or more races	5.0	4.2	3.5	3.2	2.8
Percent Hispanic or Latino [2]	18.3	19.8	28.2	11.8	17.1
Percent Below Poverty [3]	8.8	8.9	8.9	5.8	9.3
Median Household Income	$48,779[4]	$46,507	$47,323	$53,570	$47,203

Sources: U.S. Census Bureau 2000a and U.S. Census Bureau 2000b

Notes:

1. The 2000 U.S. Census data are the most recent social and economic data for the ROI (census tracts).
2. Persons of Hispanic or Latino origin can be of any race, and thus are also included in applicable race categories.
3. Based on 1999 poverty thresholds for individuals.
4. Represents the average of the median household incomes for census tracts 70.08, 71.02, 83.03, 83.09, and 83.53.

In 2000, 8.8 percent of the population within the ROI was considered low-income or "below poverty" (below 1999 poverty thresholds, which range from $8,667 to $37,076 based on family size and number of related children under 18 years old) (see **Table 3-11**) (U.S. Census Bureau 2000a, U.S. Census Bureau 2000b). When compared to the City of Aurora, the ROI had a slightly lower percentage of residents below the poverty level (8.8 percent vs. 8.9 percent). The ROI also has a lower percentage of residents below the poverty line than Adams County and the State of Colorado, but a higher percent than Arapahoe County. Residents living in the ROI have slightly higher median household income ($48,779) than those in the City of Aurora, Adams County, and State of Colorado, but lower than that of Arapahoe County ($53,570) (U.S. Census Bureau 2000b). The percent of children under 5 years old within the ROI was higher than the City of Aurora, Adams and Arapahoe counties, and the State of Colorado.

3.9 Transportation and Infrastructure

3.9.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity for expansion are generally regarded as essential to the economic growth of an area.

The infrastructure components discussed in this section include transportation, utilities, and solid waste management. Transportation is defined as the system of roadways, highways, and transit services that are in the vicinity of the proposed site and could reasonably be expected to be potentially impacted by a proposed action. Utilities include power supply, natural gas supply, water supply, sewer and wastewater systems, and communications systems. Solid waste management primarily relates to the availability of systems and landfills to support a population's residential, commercial, and industrial needs. The infrastructure information contained in this section provides a brief overview of each infrastructure component and comments on its existing general condition. Public providers supply water, natural gas, and electrical power to the proposed project areas.

3.9.2 Existing Conditions

Transportation. The Proposed Action ROI for transportation is all on-installation roadways and parking areas within Buckley AFB and major off-installation corridors near access points, including 6th Avenue, Mississippi Avenue, Airport Boulevard, Buckley Way, and State Highway 30. Major vehicle routes in the Denver Metropolitan Area include I-70, I-25, and I-76. Branching off I-70 to the west of the installation is I-225, which runs north-south through the City of Aurora. Intersecting I-225 in Aurora and running east-west are two major arteries, 6th Avenue and Mississippi Avenue. These two roads serve as the main routes into Buckley AFB through the 6th Avenue (Main) and Mississippi Gates. In addition, E-470 Toll Highway provides an alternative beltway route around the eastern half of the Denver Metropolitan Area and is to the east of the installation. E-470 extends in a north-south direction in the vicinity of Buckley AFB and is approximately 0.75 miles from the eastern boundary of the installation (BAFB 2006b).

Traffic on the installation uses a single primary street, Aspen Street, which feeds traffic to two secondary streets that distribute traffic to the industrial and flight line areas. All other streets on the installation are classified as tertiary streets, serving individual areas on the installation (BAFB 2006b). Vehicular traffic accesses the installation through the Mississippi Avenue and 6th Avenue gates.

The Mississippi Gate is to the north of Mississippi Avenue, which runs adjacent to the southern boundary of the installation. This gate provides access to Aspen Street at the southern boundary of the installation and is open 24 hours per day. Results of a study performed at the Mississippi Gate from March 8 to March 11, 2004, showed that the daily average number of vehicles entering the installation through the Mississippi Gate is 3,000. The Mississippi Gate receives approximately 680 peak morning hour (between 6:30 and 7:30 a.m.) and 80 peak evening hour (between 5:00 and 6:00 p.m.) inbound vehicles per day. All commercial vehicles (e.g., construction vehicles and delivery trucks) enter the installation via the Mississippi Gate. West of the Mississippi Gate, Mississippi Avenue is a four-lane divided boulevard with 700 vehicles per hour on the road during peak traffic hours (BAFB 2009a).

The 6th Avenue Gate (Main Gate) is immediately south of 6th Avenue, which runs adjacent to the northern boundary of the installation. The 6th Avenue Gate is open 24 hours per day and provides access to Aspen Street. The 6th Avenue Gate receives approximately 655 peak morning hour (between 6:30 and 7:30 a.m.) inbound vehicles per day (BAFB 2003b). No peak evening hour (between 5:00 and 6:00 p.m.) inbound vehicle traffic information exists for the 6th Avenue Gate; however, it is assumed to be comparable to that of the Mississippi Gate based on the similarity in the peak morning hour traffic rates.

At the 6th Avenue Gate, 6th Avenue intersects with Aspen Street, the most heavily traveled road on the installation. Aspen Street has an average daily traffic volume of approximately 4,000 vehicles per day in the central portion of the installation, which is near the Proposed Action areas (BAFB 2006b).

On 6th Avenue, the number of vehicles during the peak evening traffic hour (5:00 to 6:00 p.m.) is approximately 1,300 vehicles per hour. Traffic from E-470 accesses 6th Avenue and the south side of the installation using Jewell Avenue. Current traffic flow entering and exiting E-470 at Jewell Avenue averages 300 vehicles per day. East of the 6th Avenue Gate, at the intersection of 6th Avenue and State Highway 30, the number of vehicles during the peak evening traffic hour is 400 vehicles per hour. This value includes traffic that would have exited E-470 (BAFB 2006b).

The Regional Transportation District (RTD) bus system provides daily service from the Base Exchange and Commissary to various locations throughout the Denver Metropolitan Area. There are currently no Light Rail Transit (LRT) lines that service the installation. The proposed expansion of the LRT system would supplement transit service and increase transit alternatives to downtown Denver, DIA, and other regional transit options. Two future LRT stations are planned near the installation. The I-225 Corridor will follow I-225 and include a stop near 13th Avenue, which is about 3 miles from the 6th Avenue Gate. The Eastern Corridor will be near the intersection of 40th Avenue and Airport Boulevard, which is approximately 4 miles from the 6th Avenue Gate (BAFB 2008b). The I-225 Corridor is projected for completion by 2019 and the Eastern Corridor is projected for completion by 2016 (FasTracks RTD 2010).

Walking and bicycling are important elements of the transportation network. Both provide alternative forms of transportation and assist in the effort to reduce motorized traffic. There are no designated on-street bicycle lanes within the Proposed Action areas. There are a few pedestrian trails throughout the installation for employees and residents of Buckley AFB to use. An existing off-installation bicycle path paralleling a portion of 6th Avenue does not connect to any other City of Aurora trails at the present time. Proposed future off-street bicycle lanes would be linked to this existing off-street bike path (BAFB 2008b).

Heating and Cooling. The existing NSAC facility modular structures are assumed to be heated and cooled via individual electrically powered units. There are no buildings within the Proposed Action construction area or the temporary contractor parking area; therefore, there is no heating and cooling equipment in these areas.

Power Supply. A switchgear station is on the installation just north of Steamboat Avenue adjacent to the Proposed Action construction area. Xcel Energy provides electrical power to the installation. Buckley AFB has an off-installation purchase contract with Xcel Energy for approximately 28,478 megawatt hours per month (MWh/month) (BAFB 2007a). On-installation stationary generators can also generate up to approximately 1,060 MWh/month of electricity for emergency supplies. In FY 2007, average electricity usage at Buckley AFB was approximately 11,141 MWh/month, while peak electricity usage was approximately 13,122 MWh/month (BAFB 2007a).

Natural Gas Supply. In 2006, Xcel Energy delivered approximately 125 billion cubic feet to the regional area (Kwerneland 2007). Xcel Energy also provides natural gas to the installation. The on-installation natural gas system has a capacity of approximately 416 million cubic feet per month (mcf/month). In FY 2007, average natural gas usage at Buckley AFB was approximately 173 mcf/month, while peak natural gas usage was approximately 354 mcf/month (BAFB 2007a).

A 4-inch gas main crosses the proposed location of the operations building at the Proposed Action construction area.

Communications. The NSAC facility is provided secure communications capabilities via the ADF-C. There is no communications equipment within the Proposed Action construction area.

Liquid Fuel Supply. The ADF-C receives liquid fuel from off-installation private suppliers. There are no liquid fuel storage tanks within the areas affected by the Proposed Action; however, there are several liquid fuel storage tanks for the ADF-C in the general vicinity. Further information regarding ASTs is presented in **Section 3.10.2**.

Water Supply. Potable water at the installation is supplied by Aurora Water. Aurora Water provides potable water to approximately 310,000 customers. The water supply primarily comes from three river basins: the Colorado, Arkansas, and South Platte. The water is then stored in multiple reservoirs. Aurora has more than 155,000 acre-feet of water storage, which is enough to supply the city with water for 3 years when filled to capacity (Aurora Water 2008). Aurora currently operates two 80-million-gallon-per-day (mgd) water treatment plants, Griswold and Wemlinger, with a third scheduled to open in 2011, the Peter D. Binney Water Purification Facility. This facility will be capable of treating 50 mgd. In 2009, Aurora Water distributed approximately 35 mgd (Aurora Water 2011).

The potable water supply available to the installation from the city is up to 7 mgd; however, Buckley AFB's paid tap fees limit the supply to approximately 959,000 gallons per day (gpd) (BAFB 2007a). In FY 2006, approximately 128,645,000 gallons of water were consumed by Buckley AFB, or roughly 352,000 gpd (based upon 365 days); this number includes consumption by all sources (e.g., personnel consumption, operations, maintenance, and irrigation) (BAFB 2007a).

There are currently four water main feeds within the Proposed Action construction area. The existing water lines are steel. Based on the estimated water use of 25 gallons per person per day (Baseline Water Consumption Worksheet undated) and the current staffing of 750 people, the existing NSAC facility is estimated to use approximately 18,750 gpd.

Sanitary Sewer and Wastewater Treatment. Wastewater collection and treatment is provided to Buckley AFB by the Metro Wastewater Reclamation District (MWRD). The MWRD serves approximately 1.7 million people in a 715-square-mile service area. The MWRD treats approximately 140 mgd of wastewater from sewer lines and delivers it through 232 miles of interceptor sewers to the District's Robert W. Hite Treatment Facility in northeast Denver (MWRD undated).

Buckley AFB has separate sanitary and industrial wastewater collection systems that join before they leave the installation. The installation's annual wastewater output in 2006 was 80,329,000 gallons, which is approximately 220,080 gpd (BAFB 2007a). Assuming that all water used at the NSAC facility goes to the sanitary sewer, it is estimated that the NSAC facility generates about 18,750 gpd of wastewater.

Wastewater discharge for Buckley AFB is regulated under a Wastewater Contribution Permit issued by the MWRD. This permit requires regular wastewater sampling at the installation's northern perimeter outfall point. Samples collected from this point indicate that installation wastewater discharge quality is well within permitted pretreatment limits (BAFB 2007a).

A 10-inch sanitary sewer main is within the Proposed Action construction area.

Storm Water. In 1992, the State of Colorado storm water regulations went into effect to control municipal and industrial storm water discharges, based on USEPA regulations. The purpose of the regulation is to reduce the amount of pollutants entering streams, rivers, lakes, and wetlands as a result of runoff from residential, commercial, and industrial areas. Construction activities produce many different types of pollutants that can cause storm water contamination problems. The main pollutant of concern at construction sites is sediment. In addition, construction activities often require the use of toxic or hazardous materials that can pollute storm water.

U.S. DOD installations and personnel are required to comply with all Federal, state, and local laws designed to protect the environment. Pursuant to this requirement, the USAF has developed Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, which prescribes general responsibilities, policies, and procedures to preserve, protect, and restore the quality of the environment. To implement this policy directive, AFI 32-7041, *Water Quality Compliance*, has been specifically developed to address compliance with a number of water quality issues, including storm water pollution prevention. Under this and other USAF regulations, each major command is responsible for developing contingency plans and procedures for minimizing pollutant contributions to the environment through storm water contact and flow.

Buckley AFB holds two NPDES permits for on-installation storm water management. The first permit, an NPDES *MS4 Permit*, provides an overall management and compliance program for the owners and operators of storm water conveyance systems, in this case the 460th SW. Requirements of the MS4 permit include the preparation and implementation of a SWMP, intended to preserve, protect, and improve surface water resources from polluted storm water runoff (BAFB 2009b). The second permit, an NPDES *Storm Water Multi-Sector General Permit for Industrial Activities*, applies to potential discharges associated with industrial activities relating to air transportation and landfills at Buckley AFB. The requirements of the permit include the preparation and implementation of an SWPPP for the applicable industrial discharge, conducting a comprehensive site compliance evaluation, monitoring storm water discharges, and providing semi-annual training for personnel involved with industrial-type activities and operations.

Storm water runoff at Buckley AFB is collected and discharged via the installation's storm sewer system, a network of surface ditches and channels that are separate from the installation's sanitary sewer system. Portions of the installation's storm sewer system are underground, and underground discharges are directed either to the City of Aurora's storm sewer system or East Toll Gate Creek (BAFB 2007a). Surface storm water discharges generally flow southwest across the installation toward East Toll Gate Creek; however, discharges from the northern part of the installation flow toward the Sand Creek watershed (BAFB 2009b).

The storm water system at the Proposed Action construction area consists of sheet flow to the drainage ditch, which is man-made and is fed by storm water runoff from upstream existing impervious surfaces and year-round irrigation waters being directed to it from the adjacent areas. It drains through man-made channels to a detention pond that discharges to Granby Ditch, which eventually discharges into Toll Gate Creek.

The existing NSAC facility modular units consist of approximately 1 acre of impervious surface. Storm water from the NSAC facility sheet flows to nearby gravel and grass-covered areas. Storm water at the temporary contractor storage area percolates into the soil and sheet flows to nearby areas.

Solid Waste. Solid waste management for Buckley AFB is provided by a private contractor. Waste is collected from dumpsters throughout the installation and routinely transported to the Denver Arapahoe Disposal Site located 3 miles southeast of the installation. The landfill is permitted to operate until 2086. Buckley AFB generated approximately 1,100 tons of nonhazardous solid waste (642 tons of solid waste and 458 tons of construction/demolition waste) in FY 2010 (BAFB 2010b).

Buckley AFB participates in the USAF Pollution Prevention (P2) Program. This program encompasses a range of environmental management functions, including recycling, hazardous/toxic chemicals reduction, green (environmentally friendly) procurement, and waste minimization. All organizations on Buckley AFB are required to participate in the P2 program in accordance with the impacts of their specific operations.

3.10 Hazardous Materials and Wastes

3.10.1 Definition of the Resource

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 (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 the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. §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." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR Part 273.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act (TSCA) Title 15 U.S.C. Chapter 53. USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR Part 763 with additional regulation concerning emissions (40 CFR Part 61). Whether from lead abatement or other activities, depending on the quantity or concentration, the disposal of the LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

The DOD developed the ERP to facilitate thorough investigation and cleanup of contaminated sites on military installations (active installations, installations subject to Base Realignment and Closure, and formerly used defense sites). The Installation Restoration Program and the Military Munitions Response Program (MMRP) are components of the ERP. The Installation Restoration Program requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The MMRP addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance (UXO), discarded military munitions, or munitions constituent contamination.

For the USAF, AFPD 32-70, *Environmental Quality*, and the AFI 32-7000 series incorporate the requirements of all Federal regulations, and other AFIs and DOD Directives for the management of hazardous materials, hazardous wastes, and special hazards.

3.10.2 Existing Conditions

Hazardous Materials and Petroleum Products. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF. It applies to all USAF personnel and contractors who authorize, procure, issue, use, or dispose of hazardous materials; and to those who manage, monitor, or track any of those activities.

Buckley AFB implements a "virtual" hazardous materials pharmacy (HAZMART) that electronically tracks and controls the use of hazardous materials. Additionally, the USAF adheres to sustainable or "green" building practices that inherently use fewer hazardous materials.

Buckley AFB has a Spill Prevention, Control, and Countermeasures (SPCC) Plan for all regulated oils used on the installation (BAFB 2007b). This plan documents regulated oil containers on the installation and the inspection, testing, and maintenance procedures for those containers. The plan also contains information regarding emergency response actions. Contractors are required to develop and follow site-specific Tier I SPCC Plans if they plan to use more than 55 gallons of a petroleum, oil, and lubricant (POL) on installation. The Buckley AFB SPCC Plan is not applicable to contractors.

There are no hazardous materials or petroleum products stored or used within the Proposed Action areas.

Hazardous and Petroleum Wastes. The 460th Civil Engineer Squadron/Environmental Element (460th CES/CEAN) maintains a Hazardous Waste Management Plan as directed by AFI 32-7042, *Solid and Hazardous Waste Compliance*, Air Force Pamphlet 32-7043, *Hazardous Waste Management*, State of Colorado Hazardous Waste Regulations, and U.S. Department of Transportation regulations. The Hazardous Waste Management Plan establishes procedures and responsibilities for hazardous waste management by all personnel, including tenant organizations, who generate, store, or dispose of RCRA regulated waste at Buckley AFB (BAFB 2010c).

Hazardous wastes generated at Buckley AFB include pesticides, herbicides, deicing fluids, flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, waste oils, waste paint-related materials, and other miscellaneous wastes. Management of hazardous waste is the responsibility of each waste-generating organization and 460th CES/CEAN. Regulations and USAF directives on the management of hazardous waste apply to contractors.

Buckley AFB is classified as a small-quantity hazardous waste generator (USEPA Identification Number CO9570025644). Buckley AFB is also classified as a small-quantity handler of universal waste because it does not accumulate more than 5,000 kilograms at any one time. Buckley AFB does not have a RCRA Part B permit because it does not accumulate or store hazardous waste for more than 180 days, and does

not treat or dispose of hazardous waste on site. Used oil at Buckley AFB is recycled or used in accordance with the highest applicable priority (BAFB 2010c).

There are no hazardous or petroleum wastes stored or used within the Proposed Action areas.

In 2003, a soil characterization investigation was conducted within the Proposed Action construction and demolition areas that included the collection and analysis of surface and subsurface soil samples. The samples were analyzed for total petroleum hydrocarbons – gasoline range organics, total petroleum hydrocarbons – diesel range organics, VOCs, and polynuclear aromatic hydrocarbons. With the exception of two samples, no compounds were detected above state surface soil regulatory thresholds. The two samples that were above state regulatory thresholds were collected from fill material and contained pieces of roofing tarpaper and wood chips. These samples were found to contain the benzo(a)pyrene above the CDPHE Surface Soil Standard (BAFB 2003c).

Storage Tanks. AFI 32-7044, *Storage Tank Compliance*, identifies requirements for ASTs, underground storage tanks, and associated piping that store petroleum products and hazardous substances at USAF facilities. Materials typically stored in storage tanks include fuels for vehicles (e.g., JP-8, diesel fuel, and gasoline) and fuels for facilities operations (e.g., compressed natural gas and #2 light fuel oil). There are numerous storage tanks throughout Buckley AFB. There are no known storage tanks within the areas of the Proposed Action; however, there are several liquid fuel storage tanks at the ADF-C in the vicinity of the Proposed Action construction and demolition areas.

Environmental Restoration Program. The Buckley AFB ERP consists of 10 ERP sites, 2 of which have been closed, and 2 Areas of Concern (AOCs). Twenty-three potential AOCs are under further investigation in an installationwide Site Investigation (BAFB 2007c). A review of the installationwide Preliminary Assessment for Buckley AFB indicated no ERP sites, AOCs, or potential AOCs within the Proposed Action areas.

The Comprehensive Site Evaluation Phase I Report identifies potential MMRP areas at Buckley AFB (AFSPC 2007). A review of this document indicates no MMRP Munitions Response Areas or Additional Investigation Areas within the Proposed Action areas.

Asbestos-Containing Material. Asbestos is regulated by the USEPA under the CAA; TSCA; and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). USEPA has established that any material containing more than 1 percent asbestos by weight is considered an ACM.

AFI 32-1052, *Facilities Asbestos Management*, provides the direction for asbestos management on USAF installations. AFI 32-1052 requires installations to develop an asbestos management plan for the purpose of maintaining a permanent record of the status and condition of ACM in installation facilities, and document asbestos management efforts. The 2004 Buckley AFB Asbestos Operating Plan specifies procedures for managing ACMs in facilities for the protection of personnel to minimize potential exposure to asbestos fibers (BAFB 2004c).

In 2003, a soil characterization investigation of the Proposed Action construction and demolition areas was conducted; it included a review of aerial photographs, a soil boring program, and a laboratory analysis program. Review of the aerial photographs indicated that World War II-era structures were formerly located within the Proposed Action construction and demolition areas. Based on a layout plan of Buckley AFB dated 1945, the buildings included a day room, mess hall, infirmary, theater, lavatory, Civilian Conservation Corps facility, and barracks. By 1956, these buildings, with the possible exception of three structures, had been demolished and were replaced with 17 new structures. The function of the new structures is not known. A 1973 aerial photograph showed no buildings within the Proposed Action

construction and demolition areas. For the locations within the area of the known World War II-era development, there is the potential for asbestos to be present as (1) insulation on abandoned buried steam lines, (2) abandoned buried transit water lines, and (3) debris in surface or near-surface soils remaining from building demolition (BAFB 2003c). Therefore, the potential exists for finding ACM in the soils at the Proposed Action construction and demolition areas. Of the 13 soil samples submitted for laboratory analysis, only one contained trace amounts of asbestos (BAFB 2003c).

The 2010 Buckley AFB Soil Characterization and Management Plan indicates that the Proposed Action construction and demolition areas are associated with former historic facilities and therefore have an increased risk of containing asbestos debris or asbestos-containing soil (BAFB 2010d).

Lead-Based Paint. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards.

No lead was detected above the CDPHE surface soil standard in the soil samples that were submitted for analysis as part of the 2003 soil characterization investigation within the Proposed Action construction and demolition areas (BAFB 2003c). However, based on the former presence of World War II-era structures and indications of onsite demolition and disposal of those structures, there is the potential for LBP to be present as debris in surface or near-surface soils.

Polychlorinated Biphenyls. PCBs are a group of chemical mixtures used as insulators in electrical equipment such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the United States throughout the 1950s and 1960s. PCBs can be present in products and materials produced before the 1979 ban. Common products that might contain PCBs include electrical equipment (e.g., transformer and capacitors), hydraulic systems, and fluorescent light ballasts.

In 2003, a soil characterization investigation within the Proposed Action construction and demolition areas included the collection of soil samples for PCB analyses. There were no PCB detections above the laboratory quantitation limit in the soil samples submitted for analysis (BAFB 2003c).

The Buckley AFB electrical system is considered PCB-free. There are no suspected sources of PCBs within the areas of the Proposed Action; however, PCB-containing equipment such as transformers were used on the installation before the enactment of PCB regulations, so some PCB contamination from previously removed PCB-containing equipment might exist.

Pesticides. AFI 32-1053, *Integrated Pest Management Program*, provides guidance for pest management programs at USAF installations. It implements AFPD 32-10, *Installations and Facilities*, and DOD Instruction 4150.07, *DOD Pest Management Program.*

Buckley AFB's Integrated Pest Management Plan uses an integrated pest management approach to pest control to minimize the types and quantities of pesticides used at the installation (BAFB 2005). No pesticides, insecticides, or herbicides are known to have been stored, mixed, or disposed of within the Proposed Action areas.

In 2003, a soil characterization investigation within the Proposed Action construction and demolition areas included the collection of soil samples for pesticide analyses. Although no pesticides were detected at concentrations above the analytical reporting limit, there were three samples where the analytical reporting limit exceeded the CDPHE Surface Soil Standard value for the pesticide Dieldrin. According to the laboratory reports, the cause for the dilutions, and the resulting detection limit exceedances, were due to the dark, viscous nature of the sample extract (BAFB 2003c).

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4. Environmental Consequences

This section presents an evaluation of the environmental impacts that could result from implementing the Proposed Action or the No Action Alternative. This chapter focuses on impacts considered potentially significant. The general approach followed throughout this section is to describe briefly the range of impacts that would occur and then provide a discussion of impacts that are considered significant.

The specific criteria for evaluating potential environmental effects of the Proposed Action or the No Action Alternative are also presented under each resource area. The significance of an action is measured in terms of its context and intensity. The following elaborates on the nature of characteristics that might relate to various environmental effects. Individual resource area presentations provide more subject-specific evaluation criteria.

Short-term or long-term. In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.

Direct or indirect. A direct effect is caused by an action and occurs around the same time at or near the location of the action. An indirect effect is caused by an action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.

Minor, moderate, or significant. These relative terms are used to characterize the magnitude or intensity of an impact. A minor effect is slight, but detectable. A moderate effect is readily apparent. Significant effects are those that, in their context and due to their intensity (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 in order to fulfill the policies set forth in NEPA.

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

4.1 Noise

4.1.1 Evaluation Criteria

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

4.1.2 Environmental Consequences

Proposed Action

Construction and Demolition Noise. Noise from construction activities varies depending on the type of construction equipment being used, the area that the action would occur in, and the distance from the

noise source. To predict how construction activities would impact adjacent populations, noise from the probable construction was estimated. For example, as shown in **Table 3-2**, construction usually involves several pieces of equipment (e.g., trucks and bulldozers) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected cumulative construction noise during daytime working hours (typically 7:00 a.m. to 5:00 p.m.) at specified distances are shown in **Table 4-1**. These sound levels were predicted at 50, 100, 200, 400, 800, and 1,200 feet from the source of the noise.

Table 4-1. Predicted Noise Levels from Construction Activities

Distance from Noise Source	Predicted Noise Level
50 feet	89 dBA
100 feet	83 dBA
200 feet	77 dBA
400 feet	71 dBA
800 feet	65 dBA
1,200 feet	61 dBA

The noise from construction equipment would be localized, short-term, and intermittent during machinery operations. Heavy construction equipment would be used periodically during construction; therefore, noise levels from the equipment would fluctuate throughout the day. The proposed construction activities would be expected to result in noise levels comparable to those indicated in **Table 4-1**.

As shown in **Figure 3-1**, the 65 dBA DNL noise contour encompasses the eastern portion of the Proposed Action construction area on Buckley AFB and includes the existing NSAC facility modular structures to be demolished. Because multiple single noise events create the cumulative DNL value, the actual sound levels that a person hears within the area of the DNL noise contours fluctuate throughout a 24-hour period. Consequently, populations within and adjacent to the Proposed Action areas on Buckley AFB are accustomed to fluctuations of noise levels. In addition, noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Use of noise-control measures, such as equipment exhaust mufflers, would be implemented to minimize the noise experienced. Consequently, construction activities associated with the Proposed Action would result in short-term, minor, adverse impacts on the noise environment in the vicinity of the Proposed Action areas.

Construction workers would potentially be exposed to noise levels above 85 dBA. As defined by AFOSH, this represents a hazardous noise environment and personnel would wear hearing protection equipment. The use of hearing protection equipment would also comply with the OSHA standards provided in 29 CFR 1910.95.

Operational Noise. The proposed power plant would contain up to 10 2.5-MW, diesel-driven, electrical contingency generators and one low-wattage emergency generator (life safety generator). The 10 contingency generators are anticipated to be used for a combined total of up to 3,700 hours per year. Operation of these generators would produce considerable noise; however, much of the noise-producing equipment would be contained inside the facility superstructure, which would be fabricated with noise-reducing material. Generator exhausts would be open to the exterior of the buildings and would be

equipped with industrial silencers. Therefore, noise levels outside of the proposed power plant are expected to be minimal during generator operation. Personnel working in the proposed power plant would wear hearing protection equipment.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.1.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any noise impacts.

4.2 Land Use

4.2.1 Evaluation Criteria

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

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

4.2.2 Environmental Consequences

Proposed Action

Implementation of the Proposed Action on Buckley AFB would be in compliance with the Land Use chapter of the Buckley AFB General Plan. The Proposed Action on Buckley AFB would occur within the Mission Operations and Maintenance land use and would not require changes to the current and future land use designations. The Mission Operations and Maintenance land use is specifically designated for uses requiring high security and exclusionary areas. No impacts on land use plans and policies would be expected as a result of the Proposed Action.

Municipal zoning designations and ordinances are not applicable on Federal property; therefore, the Proposed Action would not result in any impacts on municipal (City of Aurora and Arapahoe County) land use plans or policies. The temporary contractor parking lot could be on privately owned land outside of Buckley AFB designated as Open or Light Industrial zoning districts; however, parking for a Federal project would be permitted in these zoning districts. The off-base portion of the proposed electric feeder line would be within existing easements.

Construction activities would occur in a wetland; therefore, the Proposed Action would not be consistent with DOD Instruction 4715.03, which states that DOD lands should be managed for the goal of no net loss of wetlands. See **Section 4.6** for discussion of impacts on wetlands resulting from the Proposed Action.

The Proposed Action would not preclude the viability of existing land uses or the continued use of the ADF-C or surrounding areas. The Proposed Action would be a continuation of existing land use conditions, as it would replace the existing NSAC facility with a new facility (MOUNTAINVIEW facility) at a different undeveloped location within the same general area of the ADF-C. Therefore, the Proposed Action would result in no impacts on existing land use viability or continued land occupation.

Construction and demolition activities under the Proposed Action would produce temporary, elevated noise levels that could be heard by persons immediately surrounding the proposed construction and demolition sites (see **Section 4.1** for environmental consequences related to noise). Therefore, the Proposed Action would result in short-term, negligible, adverse impacts on land use compatibility from noise production.

The Proposed Action would not conflict with planning criteria established to ensure the safety and protection of human life and property. Operation of the proposed MOUNTAINVIEW facility would be compatible with the adjacent land uses within the ADF-C and surrounding areas of Buckley AFB.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.2.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any impacts on land use.

4.3 Air Quality

4.3.1 Evaluation Criteria

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Effects on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

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

The Federal *de minimis* threshold emissions rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. **Table 4-2** presents these thresholds, by regulated pollutant applicable to Buckley AFB. As shown in **Table 4-2**, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emissions inventory above the *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. 40 CFR 93.153(c) exempts certain Federal actions from a general conformity determination. However, these exemptions do not apply to the Proposed Action.

Table 4-2. Conformity *de minimis* Emissions Thresholds Applicable to Buckley AFB

Pollutant	Status	Classification	*de minimis* **Limit (tpy)**
O_3 (measured as NO_x or VOCs)	Nonattainment	All others	100
CO	Maintenance	All	100
PM10	Maintenance	Moderate	100

Source: 40 CFR 93.153

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and stationary source emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21[b][23][iii]). As stated in **Section 3.3.2**, no Class I areas are within 10 kilometers of the Proposed Action.

The currently established criteria for evaluating GHG impacts is the GHG Reporting Rule that requires emissions of 25,000 metric tpy from stationary sources to be reported to the USEPA. There is also the 75,000 tpy and 100,000 tpy GHG thresholds of significance regarding PSD and Title V permitting. In general, a comparison of the GHG emissions from a proposed action to statewide and nationwide GHG emissions provides the best indication of the relative impact of GHG emissions from a proposed action on the global environment. This comparison is expressed in terms of a percentage, and there currently is no defined significance for the percentage.

4.3.2 Environmental Consequences

Proposed Action

***Construction and Demolition Emissions*.** Short-term, minor, adverse effects on local and short-term, negligible, adverse effects on regional air quality would result from the Proposed Action construction and demolition activities. Construction and demolition activities would generate air pollutant emissions primarily from site-disturbing activities such as grading, filling, compacting, and trenching; operation of construction and demolition equipment; and evaporative emissions from architectural coatings. Construction and demolition activities would also generate particulate emissions as fugitive dust from ground-disturbing activities and from the combustion of fuels in construction and demolition equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Construction and demolition activities would incorporate BMPs and control measures (e.g., frequent use of water for dust-generating activities) to minimize fugitive particulate matter emissions. Additionally, the construction vehicles are assumed to be well-maintained and could use diesel particle filters to reduce emissions. Construction workers commuting daily to and from the construction site in their personal vehicles would also result in criteria pollutant emissions. Emissions from the construction and demolition activities associated with the Proposed Action are summarized in **Table 4-3**. **Appendix C** contains detailed calculations and the assumptions used to estimate the air emissions from construction and demolition activities. The total construction and demolition process is anticipated to last for more than 1 year; however, for the purposes of this air quality analysis, construction and demolition is calculated as occurring in only 1 year. As a result, the emissions estimates in this air quality analysis are conservative.

Table 4-3. Estimated Annual Air Emissions Resulting from Construction and Demolition for the Proposed Action

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Combustion Emissions	6.516	0.813	2.798	0.412	0.449	0.436	748.363
Fugitive Dust Emissions	-	-	-	-	31.233	3.123	-
Construction Commuter Emissions	0.110	0.110	0.992	0.001	0.010	0.007	131.482
Total Annual Construction and Demolition Emissions	**6.626**	**0.922**	**3.790**	**0.413**	**31.692**	**3.566**	**879.845**
Percent of MDI AQCR Inventory	**0.006%**	**0.001%**	**< 0.000%**	**0.0011%**	**0.059%**	**0.027%**	**0.001%***

Note: * Percent of State of Colorado's 2008 CO_2 emissions (DOE/EIA 2010).

Short-term, negligible, adverse effects on GHG emissions would be expected from the construction and demolition activities associated with the Proposed Action. Construction and demolition activities associated with the Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. Because CO_2 emissions account for approximately 92 percent of all GHG emissions in the United States, they are used for analyses of GHG emissions in this assessment. The U.S. Department of Energy, Energy Information Administration estimates that in 2008 gross CO_2 emissions in the State of Colorado were 97.5 million metric tons and in 2008 gross CO_2 emissions in the entire United States were 5,814.4 million metric tons (DOE/EIA 2010). Annual construction and demolition activities associated with the Proposed Action would emit 798 metric tons of CO_2 (or 879.8 U.S. tons). Total annual CO_2 emissions from the construction and demolition activities associated with the Proposed Action would be 0.001 percent of the State of Colorado's 2008 CO_2 emissions and less than 0.001 percent of the entire United States' 2008 CO_2 emissions. Thus, construction and demolition from the Proposed Action would represent a negligible contribution towards statewide and national GHG inventories.

Table 4-3 and **Appendix C** do not include emissions estimates for the installation of the off-base portion of the electric feeder line; however, based on the minimal construction activities that would be associated with this action, it is predicted that the resulting emissions would be negligible and not change the magnitude of the short-term, minor, adverse effects on air quality.

Operating Emissions. Long-term, minor, adverse effects on local and regional air quality would result from operation of the proposed MOUNTAINVIEW facility. The proposed MOUNTAINVIEW facility would use up to 10 2.5-MW, diesel-driven, electrical contingency generators and one low-wattage emergency generator. Operation of these generators would produce air emissions. The 10 contingency generators are anticipated to operate a combined total of up to 3,700 hours per year for nonemergency operational conditions and operations and maintenance purposes, and the emergency generator would operate extremely infrequently during emergencies. **Table 4-4** estimates the yearly emissions from the operation of the contingency generators. **Appendix C** contains detailed calculations and the assumptions used to estimate the air emissions (NSA 2010a). Emissions from the emergency generator are not estimated due to the anticipated infrequent use. Emissions from the contingency generators would be minimized by conducting proper maintenance to all equipment and by installing pollution-control devices to control emissions of some pollutants. Detailed air quality modeling would be performed prior to the installation of these generators to identify the local and regional air quality impacts from their operation.

Table 4-4. Estimated Annual Air Emissions Resulting from the Operation of Contingency Generators

Activity	NO_x tpy	NMOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	CO_2 tpy
Contingency Generators Emissions	22.298	1.050	5.335	0.096	1.125	10,454.813
Percent of MDI AQCR Inventory	**0.019%**	**0.001%[1]**	**0.001%**	**< 0.001%**	**0.002%**	**0.010%[2]**

Source: NSA 2010a

Notes:

1. Compared to VOC Inventory; NMOC emissions are typically assumed to be equivalent to VOC emissions.
2. Percent of State of Colorado's 2008 CO2 emissions (DOE/EIA 2010).

Key: NMOC = non-methane organic compound

The proposed MOUNTAINVIEW facility would use a natural gas-fired hot water boiler system to heat the interior of the operations building. Operating this heating system would produce air emissions. As calculated in **Section 4.9.2**, the proposed MOUNTAINVIEW facility would use approximately 11 million cubic feet (mcf) of natural gas per year for heating purposes. **Table 4-5** estimates the yearly emissions from the combustion of 11 mcf of natural gas per year in the natural gas-fired hot water boilers. **Appendix C** contains detailed calculations and the assumptions used to estimate the air emissions.

Table 4-5. Estimated Annual Air Emissions Resulting from the Operation of Natural Gas-Fired Hot Water Boilers

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	CO_2 tpy
Natural Gas-Fired Hot Water Boiler Emissions	1.540	0.030	0.462	0.003	0.042	660.000
Percent of MDI AQCR Inventory	**0.001%**	**< 0.001%**	**< 0.001%**	**< 0.001%**	**< 0.001%**	**0.001%***

Note: * Percent of State of Colorado's 2008 CO_2 emissions (DOE/EIA 2010).

The proposed MOUNTAINVIEW facility would house approximately 850 personnel. Most of these individuals would transfer from the existing NSAC facility; however, there would be a net gain of approximately 100 personnel over the 10-year period subsequent to construction. The addition of these 100 workers would result in a negligible increase in air emissions from workers commuting daily to and from the proposed MOUNTAINVIEW facility in their personal vehicles. **Table 4-6** estimates the yearly emissions from the added workforce commuting to and from the proposed MOUNTAINVIEW facility. **Appendix C** contains detailed calculations and the assumptions used to estimate the air emissions.

Long-term, negligible, adverse effects on GHG emissions would be expected from the operation of the proposed MOUNTAINVIEW facility. Operating the proposed MOUNTAINVIEW facility would contribute directly to emissions of GHGs from the combustion of fossil fuels. Annual operating activities associated with the Proposed Action would emit 10,558.2 metric tons of CO_2 with 10,081.1 metric tons being produced from stationary sources. Total annual CO_2 emissions from operating the proposed MOUNTAINVIEW facility would be 0.010 percent of the State of Colorado's 2008 CO_2 emissions and less than 0.001 percent of the entire United States' 2008 CO_2 emissions. Therefore, operating the proposed MOUNTAINVIEW facility would represent a negligible contribution towards statewide and

Table 4-6. Estimated Annual Air Emissions Resulting from New Commuters

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
New Commuter Emissions	0.441	0.439	3.966	0.005	0.042	0.026	525.928
Percent of MDI AQCR Inventory	**< 0.001%**	**< 0.001%**	**0.001%**	**< 0.001%**	**< 0.001%**	**< 0.001%**	**< 0.001%***

Note: * Percent of State of Colorado's 2008 CO_2 emissions (DOE/EIA 2010).

national GHG inventories. CO_2 emissions would be less than the 25,000 metric tons of CO_2 equivalent emissions per year required for reporting stationary source emissions and below the 75,000 metric tons of CO_2 equivalent emissions per year threshold of significance for air permitting. It is recommended that Buckley AFB calculate total installation GHG emissions with the Proposed Action to compare to the 25,000 metric ton reporting threshold and determine applicability of reporting such emissions to the USEPA.

General Conformity. The portions of the MDI AQCR that would be affected by the Proposed Action are designated as attainment/unclassified for all criteria pollutants except CO, PM_{10}, and 8-hour O_3. CO is designated as serious maintenance, and PM_{10} is designated as moderate maintenance. 8-hour O_3 is designated as Former Subpart 1 nonattainment. Based on these designations, the General Conformity Rule requirements are applicable for these criteria pollutants. **Table 4-7** compares the estimated annual emissions from construction and demolition activities and the estimated annual emissions from facility operations to the *de minimis* threshold limits established for the MDI AQCR. Construction and demolition emissions and operating emissions would not be produced in the same year; therefore, these totals cannot be summed.

Table 4-7. Comparison of Annual Construction and Demolition Emissions and Operating Emissions for the Proposed Action to the General Conformity Rule *de minimis* Limits

Activity	NO_x tpy	VOC tpy	CO tpy	PM_{10} tpy
Combustion Emissions	6.516	0.813	2.798	0.449
Fugitive Dust Emissions	-	-	-	31.233
Construction Commuter Emissions	0.110	0.110	0.992	0.010
Total Annual Construction and Demolition Emissions	**6.626**	**0.922**	**3.790**	**31.692**
Contingency Generators Emissions*	22.298	1.050	5.335	1.125
Natural Gas-Fired Hot Water Boiler Emissions*	1.540	0.030	0.462	0.042
New Commuter Emissions	0.441	0.439	3.966	0.042
Total Annual Operating Emissions	**24.279**	**1.519**	**9.763**	**1.209**
General Conformity Rule *de minimis* Limits for MDI AQCR	**100**	**100**	**100**	**100**

Note: * This is an emissions source that requires state review/approval under a construction or construction /operation permit; therefore, these emissions do not require comparison to the General Conformity Rule *de minimis* limits.

No effects from the General Conformity Rule would be expected for the Proposed Action. As noted in **Table 4-7**, construction and demolition activities and operating the proposed MOUNTAINVIEW facility would generate air emissions below *de minimis* threshold limits. In addition, the General Conformity Rule does not require emissions from sources required to obtain an air quality construction permit to be compared to *de minimis* thresholds. The contingency generators and natural gas-fired hot water boilers would be permitted by the CDPHE; therefore, these emissions do not contribute to *de minimis* thresholds limits.

Table 4-7 does not include emissions estimates for the installation of the off-base portion of the electric feeder line; however, based on the minimal construction activities that would be associated with this action, it is predicted that the addition of these emission to the rest of the Proposed Action emissions would still result in air emissions below *de minimis* threshold limits.

Air Quality Permits. Long-term, moderate, adverse effects on air permitting would result from the construction and operation of the proposed MOUNTAINVIEW facility. Due to the applicability of NSPS to all new reciprocating internal combustion engines (40 CFR 60, Subpart IIII), the Proposed Action would require a construction air permit from the CDPHE prior to the start of construction and demolition activities. The air permitting process and requirements involve reporting air emissions through the submission of an APEN, and for sources with air emissions exceeding certain thresholds or triggering a NSPS, issuing of a construction air permit. The contingency generators and the emergency generator are classified as new reciprocating internal combustion engines subject to a construction permit. In addition, because Buckley AFB is a PSD major source as indicated in their Title V operating permit (NO_2 greater than 250 tpy; measured as NO_x), the construction permit would need to incorporate federally enforceable emissions limits and emissions controls to stay below the PSD major modification significant emissions rates (e.g., 40 tpy for NO_x, 15 tpy for PM_{10}, and others). Once a facility is a PSD major source for one pollutant and then proposes a modification, all other attainment pollutants must be below their significant emissions rates so that a PSD major modification will not apply. In addition, these federally enforceable emissions limits and emissions controls are also needed to stay below the NANSR major modification significant emissions rate for NO_x of 40 tpy. The federally enforceable limits and controls would be incorporated into the new construction permit.

Emissions from the natural gas-fired hot water boilers would likely be exempt from an APEN and a construction permit if their heat input capacity is below the exemption levels in the Colorado Construction Permit requirements, or their individual unit emissions are below 1 tpy for nonattainment pollutants and below 2 tpy for attainment pollutants. However, further evaluation would be required to confirm these exemptions once the design and heat input capacity of the boilers has been determined.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.3.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any air quality impacts.

4.4 Geological Resources

4.4.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential effects of a proposed action on geological resources. Generally, adverse effects can be avoided or minimized if proper construction techniques, erosion-control and storm water management measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be significant if they would alter the lithology, stratigraphy, and geological structures that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or substantially change the soil composition, structure, or function within the environment.

4.4.2 Environmental Consequences

Proposed Action

Short-term, negligible to minor, adverse effects on geology and soils would be expected from the implementation of the Proposed Action, as approximately 24.5 acres of land would be disturbed. The implementation of the Proposed Action would require trenching, grading, excavating, recontouring, disturbance of soil, removal of existing vegetation, and replacement of storm water-handling infrastructure. These actions would temporarily increase the potential for erosion and sedimentation until revegetation and long-term storm water-handling methods are reestablished. Soil erosion and associated sedimentation would be minimized during all construction and demolition operations by following an approved sediment-and-erosion-control plan, the *460 SW Storm Water Pollution Prevention Plan* (BAFB 2006c), and Section 438 of the EISA (see **Section 4.5** for a description of Section 438 of the EISA). Use of properly designed storm water-control measures and construction and demolition BMPs would minimize the potential for erosion and associated sedimentation resulting from storm events during the implementation of the Proposed Action. Erosion- and sediment-control BMPs could include installing silt fencing and sediment traps, applying water to disturbed soil, phasing construction where possible, and revegetating disturbed areas as soon as possible following the disturbance, as appropriate. Minor, adverse impacts due to the potential for increased sheet flow from grading, contouring, and trenching would be expected to be temporary and mitigated by the implementation of the BMPs.

The soil (Fondis silt loam) mapped at the Proposed Action areas is rated as somewhat to very limited for the construction of small commercial buildings, roads, and shallow excavations. If necessary, site-specific soil surveys would be conducted prior to implementing the Proposed Action to determine the breadth and severity of engineering limitations and appropriate design considerations or BMPs to offset potential adverse effects.

Long-term, negligible to minor, adverse effects on geology and soils would be expected as a result of the Proposed Action. The disturbance of soil could result in the modification to natural soil structure and local topographical conditions. However, because all construction and demolition activities for the Proposed Action would occur in areas that have already been subjected to past development, natural soil structure has largely been removed and current topographic conditions result from past man-made actions. As such, only negligible to minor effects would be expected. No long-term impacts would be expected from the construction and use of the temporary contractor parking area because it would be returned to preconstruction condition following construction and demolition activities.

Disturbance of existing soil structure and the addition of approximately 6 acres of new impervious surface could increase the volume and velocity of storm water runoff. Increased storm water runoff volume and velocity could locally increase the velocity of flows into nearby streams during storm events. This could increase stream bank erosion and downstream sedimentation as streams adjust to accommodate the increased flow volume and velocity. Long-term soil erosion- and sediment-control measures would be incorporated into site plans to minimize long-term erosion and sediment production. Section 438 of the EISA would be adhered to so that pre- and post-development hydrology would be equal. The use of storm water-control measures that favor reinfiltration would minimize the potential for erosion and sediment production as a result of future storm events. Further details regarding surface water are presented in **Section 4.5**.

The disturbance of soil during the implementation of the Proposed Action would also adversely affect long-term soil productivity. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in areas where soil structure is disturbed and would be eliminated in areas within the footprint of development. However, the effects on soil productivity would be considered negligible to minor because the Proposed Action construction and demolition areas are already developed and soils already have been heavily disturbed. The Proposed Action construction and demolition areas are currently not used or proposed for agricultural use.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.4.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any geology or soils impacts.

4.5 Water Resources

4.5.1 Evaluation Criteria

Evaluation criteria for effects on water resources are based on water availability, quality, and use and associated regulations. A proposed action would have significant effects on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Overdraft groundwater basins
- Exceed safe annual yield of water supply sources
- Substantially adversely affect water quality
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

4.5.2 Environmental Consequences

Proposed Action

Groundwater. The Proposed Action has the potential for short- and long-term, negligible to minor, adverse impacts on groundwater. Facilities would intrude into the subgrade because the operations building would include a basement below ground level. Depth to groundwater in the area of the proposed operations building is greater than 20 feet below ground surface (bgs); however, it is possible that groundwater might be encountered during construction activities. Therefore, construction activities associated with the Proposed Action could impact the quality of groundwater. If groundwater is encountered, appropriate measures would be taken to pump out and dewater any groundwater. If necessary, the dewatering process could include draining to grade, sampling prior to discharge, and discharge to the Buckley AFB MS4 or surface. It may also be necessary to obtain a dewatering permit through the CDPHE for the off-base portion of the electric feeder line, which may also require sampling prior to discharge. The potential for groundwater contamination also exists during the installation of various underground utilities. Standard construction site BMPs, such as maintaining construction equipment in a clean and well-functioning condition to avoid leaks from mechanical and automotive fluids, would be implemented to prevent contamination of groundwater. Assuming appropriate BMPs are implemented during construction and demolition activities, short-term, minor, adverse effects on

groundwater quality would be expected. In the event of a spill or leak of fuel or other construction-related products, there could be adverse effects on groundwater. All fuels and other potentially hazardous materials would be contained and stored appropriately. In the event of a spill of a POL, procedures outlined in the SPCC Plan would be followed (see **Section 3.10** for a discussion on hazardous materials and wastes).

Ground disturbance associated with construction and demolition activities could adversely impact groundwater quality by increasing suspended solids in the water. Accumulated groundwater quantities that would require dewatering of the proposed site would be discharged into the storm sewer system in accordance with provisions of the Buckley AFB NPDES permit requirements. Short-term, minor, adverse impacts on groundwater quality could result from the Proposed Action.

Long-term, negligible, adverse impacts on groundwater quality and recharge from the Proposed Action would be expected. Increases in impervious surfaces would change peak flow runoff, divert runoff to storm water management infrastructure, and reduce runoff and infiltration of natural surfaces, which would reduce shallow groundwater recharge over time. Storm water management infrastructure for the Proposed Action is still being designed, but would include items such as drainage culverts and a detention pond to reduce the effects of the increase in impervious surfaces. Compliance with Federal, DOD, and state regulations would minimize these adverse effects.

Surface Water. Short-term, minor and long-term, negligible, adverse effects on surface water and surface water quality could occur from disturbance and exposure of soils over approximately 24.5 acres due to the Proposed Action. Soil disturbance from construction and demolition activities has the potential to result in minor disruption of natural drainage patterns, contamination of storm water discharge, and heavy sediment loading. Facilities and storm water controls would be designed with consideration for the UFC LID features with the goal of maintaining or restoring the natural hydrologic functions of the site. Increased sediment runoff would increase surface water turbidity in receiving waters, which could raise water temperature and impede photosynthetic processes. Sediment transported by runoff into surface waters also increases the potential for contaminant (e.g., heavy metals, excess nutrient concentrations) deposition into receiving water bodies. If necessary, construction dewatering could result in surface discharge; appropriate BMPs would be implemented. Preparing and implementing an SWPPP can minimize adverse impacts. The goal of the SWPPP is to reduce or eliminate storm water pollution from construction activities by planning and implementing appropriate pollution control practices to protect water quality.

The proposed route for the proposed electric feeder line could require crossing under Sand Creek. Xcel Energy has indicated that directional boring under Sand Creek, which would avoid environmental impacts to floodplains, wetlands, and other waters, is a preferred approach to situations such as presented by Sand Creek rather than trenching. Directional boring would allow disturbance activities to be located outside of the floodplain area and riparian area of Sand Creek. Storm water control BMPs for construction would also be implemented.

The NPDES storm water program requires construction site operators engaged in soil-disturbing activities (e.g., clearing, grading, and excavating) that disturb 1 acre or more, including smaller sites in a larger common plan of development, to obtain coverage under an NPDES permit for their storm water discharges. Storm water discharge from construction activities is not covered under Buckley AFB's existing NPDES Permit No. CO-R042000. The construction project operators would be required to obtain storm water discharge coverage under the USEPA NPDES *General Permit for Stormwater Discharges for Construction Activity in Colorado, COR10000F* (i.e., CGP) for the on-base portions of the Proposed Action and under the CDPHE *General Permit for Stormwater Discharges Associated with Construction Activity (COR-030000)* and the City of Aurora's *Stormwater Quality Discharge Permit for*

Construction Activities for the off-base portions of the Proposed Action. The construction project operators are defined in the CGP and typically include the Government proponent (NSA) and the construction contractor. Operators of regulated construction sites are required to develop SWPPPs and to implement sediment, erosion, and pollution-prevention measures. Storm water management (e.g., controls) of construction activities on Buckley AFB is covered under Buckley AFB's MS4 Permit No. CO-R042000 and the 460 SW, as permittee, would provide oversight monitoring and inspection.

The construction project operator would be required to meet the non-numeric effluent limitations of the CWA for its NPDES permit and design, install, and maintain effective erosion and sedimentation controls in accordance with the requirements stipulated in the 2008 CGP. The implementation of these non-numeric effluent limitations would minimize short-term, adverse effects on surface waters from erosion, sedimentation, and pollution. The total area of potential soil disturbance associated with the Proposed Action would be approximately 24.5 acres.

Short- and long-term, minor, indirect, adverse impacts would result from the overall increase in impervious surfaces associated with the Proposed Action. Overall, the Proposed Action would result in an increase of approximately 6 acres of impervious surfaces. The Proposed Action would contribute approximately 7 acres of new impervious surfaces, but demolition of the existing NSAC facility would remove approximately 1 acre of existing impervious surfaces. The impervious surface components of the Proposed Action would include approximately 140,000 ft^2 for the operations building, 5,000 ft^2 for the chiller plant, 19,000 ft^2 for the power plant, 10,000 ft^2 for the ASTs, and 130,000 ft^2 for the parking lot and associated access roadways. Impervious surfaces repel water and prevent rainfall or snowmelt from infiltrating soils. Therefore, during precipitation events, impervious surfaces increase the volume and accelerate the speed at which water is directed into receiving surface water bodies. This runoff could impact the surface water quality of the receiving water body. However, adverse effects would be minimized by implementing erosion-and-sediment-control and storm water management practices to minimize potential adverse effects associated with increased runoff. The Proposed Action would include LID features such as a green roof, which would decrease the rate and volume of runoff.

The construction project operators would be subject to the new storm water design requirements of Section 438 of the EISA that require Federal construction projects that disturb 5,000 ft^2 or more of land to maintain or restore predevelopment site hydrology to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow.

Overall, construction and demolition activities would have the potential to result in adverse effects on surface water quality, but the development of a site-specific SWPPP and erosion-and-sediment-control plan would minimize the potential for adverse effects. Appropriate BMPs would be implemented and would follow the guidelines provided in documents such as Buckley AFB's SWPPP and Federal and state permitting processes. Assuming proper use of BMPs, impacts on surface water resources would be expected to be negligible.

Short-term, negligible, adverse effects on surface water resources would be expected due to the use of water supplied by the City of Aurora for dust suppression during construction and demolition activities. The city's water supply comes primarily from the Colorado, Arkansas, and South Platte River basins; however, a small percentage of water comes from groundwater in deep aquifer wells (Aurora Water 2008). If water application were required for dust suppression, sufficient water resources would be available from the City of Aurora.

Operation of the proposed MOUNTAINVIEW facility would require an average of approximately 290,000 gallons of water per day. See **Section 4.9** for impacts from potable water demand.

Wetlands. Long-term, minor, adverse impacts on wetlands would be expected due to the removal of a 220-ft^2, isolated, non-jurisdictional (McKee 2010) wetland area during construction of the Proposed Action. Removal of the wetland would result in a potential change in storm water flow patterns and could result in a potential increase in erosion and sedimentation. However, storm water would be managed to meet the requirements of a storm water construction permit; Section 438 of EISA; and Federal, state, and local requirements. Storm water management infrastructure is still being designed but might include drainage culverts and detention ponds, as necessary. In addition, site-specific SWMP and erosion-and-sediment-control measures would be developed and implemented. See **Section 4.6** for more information on wetlands impacts.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.5.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any impacts on water resources.

4.6 Biological Resources

4.6.1 Evaluation Criteria

The level of impact 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 habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern. A habitat perspective is used to provide a framework for analysis of general classes of effects (i.e., removal of critical habitat, noise, human disturbance).

Ground disturbance and noise associated with construction can directly or indirectly cause adverse effects on biological resources. Direct effects from ground disturbance are evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Habitat removal and damage or degradation of habitats might be adverse effects associated with ground-disturbing activities.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions will not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with the USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project. The "take" of a federally protected species under the ESA would be considered significant.

Determination of the significance of wetland impacts is based on (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the duration of ecological ramifications. Impacts on wetland resources are considered significant if high-value wetlands would be adversely affected.

4.6.2 Environmental Consequences

Proposed Action

Vegetation. Vegetation at the Proposed Action construction area would experience short-term to long-term, minor, adverse impacts during construction, and long-term, minor, adverse impacts from the loss of approximately 20 acres of prairie grasses and other vegetation. Based on the Vegetation Map in the Integrated Natural Resources Management Plan (BAFB 2009b), the Proposed Action construction area on Buckley AFB is dominated by crested wheatgrass. Direct impacts on vegetation would occur from the Proposed Action due to clearing construction areas and permanently converting some of the area to impervious surfaces. Temporary impacts would occur as the result of converting a currently grass-covered area to gravel in support of the temporary contractor vehicle parking area. Following the completion of the proposed construction and demolition activities, the temporary contractor parking area would be returned to natural conditions.

Wildlife. Short-term and long-term, minor, direct, adverse effects on wildlife could occur as a result of implementing the Proposed Action. The Proposed Action construction area is suitable habitat for ground-nesting birds, raptors, mammals, and reptiles. The Migratory Bird Treaty Act protects all migratory birds (e.g., ground-nesting birds, raptors) by prohibiting taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Ground-nesting birds and other species within the Proposed Action construction area would experience short-term, minor, adverse impacts because they would be displaced to other areas. Direct impacts from mortality of smaller, less-mobile species could occur during construction if those species are present. Human presence and heavy equipment present during construction and demolition activities would be likely to displace wildlife that is present on or near the construction and demolition areas. The duration and distance an animal is displaced are generally dependent on the individual or species, and an individual's response to disturbance can change with time. Wildlife could be permanently displaced from the areas where the habitat is cleared and temporarily dispersed from areas adjacent to the project areas during construction and demolition periods. Disturbance to wildlife is expected to be minor; Buckley AFB is an active military installation, and any animals residing in or near the Proposed Action areas have adapted to noise and human activity associated with an active military installation.

Noise created during construction and demolition activities could result in adverse effects on wildlife. These effects would include subtle, widespread effects from the overall elevation of ambient noise levels and would result in reduced communications ranges, interference with predator/prey detection, or habitat avoidance. More intense effects would include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, age, and sex composition. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can become accustomed (or habituate) to the noise. The rate of habituation to short-term disturbance is not known. Wildlife species inhabiting the Proposed Action construction and demolition areas might be displaced as construction and demolition activities are conducted, but would be expected to temporarily move to adjacent, less-used habitat and then potentially return to the area. Increased mortality of less-mobile species would be expected as the result of unavoidable direct impacts associated with construction and demolition activities. Overall, impacts on wildlife would be less than significant.

Protected and Sensitive Species. Short-term, minor, direct and indirect, adverse effects on protected or sensitive species could occur as a result of implementing the Proposed Action. If design and implementation of a Federal action cannot avoid measurable negative impact on migratory birds, EO 13186 requires the responsible agency to consult with the USFWS and obtain a Migratory Bird

Depredation Permit (BAFB 2008c). The following BMPs are recommended for reduction or avoidance of impacts on migratory birds:

- Any groundbreaking construction activities should be performed before migratory birds return to the site (approximately March 15) or after all young have fledged (approximately July 31) to avoid incidental take.
- If construction is scheduled to start during the period in which migratory bird species are present, steps should be taken to prevent migratory birds from establishing nests in the potential impact area. These steps could include covering equipment and structures and use of various excluders (e.g., noise). Birds can be harassed to *prevent* them from nesting on the site. Once a nest is established, they cannot be harassed until all young have fledged and are capable of leaving the nest site.
- If construction is scheduled to start during the period when migratory birds are present, a site-specific survey for nesting migratory birds should be performed starting at least 2 weeks prior to site clearing.
- If nesting birds are found during the survey, buffer areas should be established around nests.
- Construction should be deferred in buffer areas until birds have left the nest. Confirmation that all young have fledged should be made by a qualified biologist.

If the above BMPs cannot be fully implemented due to health, safety, or mission constraints, a Migratory Bird Depredation Permit must be obtained from the USFWS.

Although black-tailed prairie dogs were recently delisted as a Federal candidate species, the *Supplement to Environmental Assessment of Proposed Prairie Dog Management Practices at Buckley Air Force Base* (BAFB 2001) still provides a black-tailed prairie dog management directive for Buckley AFB, which is applicable until it is revised or replaced by another EA or management directive. Black-tailed prairie dogs are a species of special concern in Colorado, and their burrows support numerous other wildlife species, including nesting burrowing owls.

Burrowing owls have nested in various locations throughout Buckley AFB and the surrounding area where suitable prairie dog habitat occurs. Owls can be found on the installation between March 1 and October 31 of any given year. During construction and demolition, there is the possibility that a nest could be disturbed. To avoid disturbances to potential nesting burrowing owls, a survey would be conducted prior to any construction activities. Unlike the prairie dogs, they cannot be moved and must not be disturbed during nesting (April through July). If nesting burrowing owls are present, activities would only commence after the owls have migrated from the area. If nesting burrowing owls are identified and are present, a 150-foot (45.72-meter) buffer would be established around active nest sites during the breeding season to protect the owls from disturbances associated with construction and demolition, especially increased noise.

Other sensitive species such as the ferruginous hawk, bald eagle, and loggerhead shrike are mobile. While the two raptors are mostly winter visitors, the loggerhead shrike and other migratory birds might nest at or near Buckley AFB. Therefore, the Proposed Action construction area and temporary contractor parking area would need to be surveyed prior to the start of any construction activities.

Wetlands. Short-term and long-term, minor to moderate, direct and indirect, adverse effects on wetlands would occur as the result of the Proposed Action. A 220-ft^2 wetland area is within the footprint of the proposed MOUNTAINVIEW facility. The wetland is isolated and nonjurisdictional (McKee 2010). A copy of the available documentation regarding the jurisdictional status of the wetland should be available

at the project site during project implementation. The USACE Denver Regulatory Office of the Omaha District is responsible for wetlands and waters of the United States regulation and permitting in the project areas. This wetland area cannot be avoided and would be eliminated during the construction of the proposed facility. Because of the low value of this wetland, instead of offsetting the loss of this wetland through traditional enhancement of wetlands elsewhere, a contribution to overall wetlands conservation on Buckley AFB would be performed via contributing some bio-engineering materials for small-scale stabilization efforts along East Toll Gate Creek or in the area of the Proposed Action to meet the spirit and intent of EO 11990. The NSA would coordinate with Buckley AFB in the selection of the wetlands conservation contribution and fund the associated activities.

Wetlands would not be disturbed during the demolition of the existing NSAC facility or the construction of the temporary contractor parking area because there are no wetlands in these areas.

Based on the proposed route of the electrical feeder line, Xcel Energy would use directional boring at Sand Creek or any other wetland area if crossing is necessary. Xcel Energy would coordinate with the USACE if Section 404 permitting is necessary. Based on the proposed route and design, there would be no significant environmental impacts from installation or use of the proposed electrical feeder line. If another route or design results in a significant change, then the USAF would undertake appropriate additional environmental impact analysis pursuant to USAF NEPA regulations.

Short-term and long-term, negligible, indirect, adverse effects on regional wetlands along the storm water discharge route of the Proposed Action areas might occur as a result of the construction and demolition activities and increase in impervious surfaces. The Proposed Action would result in approximately 6 acres of new impervious surfaces that would increase the volume of storm water runoff and increase the potential for erosion and sedimentation. Storm water management and erosion-and-sediment-control BMPs would be implemented to minimize adverse effects from construction and demolition activities (see storm water discussion in **Section 4.5**).

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.6.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any biological resources impacts.

4.7 Cultural Resources

4.7.1 Evaluation Criteria

Adverse impacts on cultural resources include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; and indirect impacts, such as introducing visual or audible elements that are out of character with the property or that alter its setting. The general neglect of the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of the agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance can also create adverse effects.

For the Proposed Action, the most likely adverse effects on cultural resources would result from ground-disturbing activities associated with construction and demolition.

4.7.2 Environmental Consequences

Proposed Action

No impacts on cultural resources and viewsheds would be expected under the Proposed Action. No adverse effects on historic properties or TCPs would be anticipated. The Proposed Action would not adversely affect any culturally significant buildings or structures on Buckley AFB, including the four NRHP-eligible radomes just south of the existing NSAC facility, because these buildings would not be directly altered or modified by the Proposed Action. The proposed MOUNTAINVIEW facility would be constructed to be no taller than the existing Building D within the ADF-C; therefore, limited visual impacts on the radomes would be expected. Demolition of the existing NSAC facility would provide slightly better views of the radomes. The 2004 cultural resources survey of the Proposed Action construction area on Buckley AFB concluded that the area was previously disturbed and lacked archaeological potential; therefore, there is only limited potential for the discovery of unidentified cultural resources during ground-disturbing activities.

If the location of the temporary contractor parking area has not been highly disturbed or previously surveyed for cultural resources, a cultural resources survey would be necessary to identify any aboveground or shallow cultural resources features that would be impacted by it use.

In the unlikely event cultural resources are identified during the ground-disturbing activities, the SOPs described in the Buckley AFB ICRMP would be followed to minimize potential adverse effects. Specific SOPs that might be applicable to this project include SOP 1—Planned new construction or rehabilitation, SOP 2—Planned demolition of buildings and structures, SOP 5—Unanticipated discovery of archaeological deposits, and SOP 6—Inadvertent discovery of Native American human remains and associated funerary objects, sacred objects, or objects of cultural patrimony (BAFB 2006a).

Cultural resources would not be expected to be impacted along the off-base portion of the proposed electric feeder line because the proposed route is within existing easements that have been previously disturbed. In the unlikely event that cultural resources are identified during off-base ground-disturbing activities, similar SOPs as those described in the Buckley AFB ICRMP would be implemented to minimize potential adverse effects. While Buckley AFB's ICRMP would not be applicable off-base, the general procedures outlined in the SOPs would still be followed to minimize potential adverse effects on cultural resources.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.7.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any cultural resources impacts.

4.8 Socioeconomics and Environmental Justice

4.8.1 Evaluation Criteria

Socioeconomics. The significance of socioeconomic impacts is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., income, housing, employment). The magnitude of potential impacts can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an

urban area, but could have significant impacts in a rural community. If potential socioeconomic changes were to result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, they would be considered significant.

Environmental Justice. Ethnicity and poverty data are examined for the ROI and compared to city, county, and state statistics to determine if a low-income or minority population could be disproportionately affected by the Proposed Action. This section also evaluates impacts from the Proposed Action on children's environmental health and safety risks.

4.8.2 Environmental Consequences

Proposed Action

Short-term, minor, beneficial effects on the economy of the ROI from increases in employment and local business volume during construction and demolition would be expected under the Proposed Action. Construction and demolition costs associated with the Proposed Action would be approximately $141 million (NSA 2010b). The quantity of workers required for construction and demolition activities is not expected to be substantial. As of 2000, approximately 40,000 residents of Adams and Arapahoe counties were employed in the construction industries. Therefore, there would be sufficient workers available for the construction and demolition activities associated with the Proposed Action. In addition, with the December 2010 unemployment rate in the Denver MSA at 8.6 percent, it is likely that sufficient local workers would be available. Short-term increases in local business volume within the ROI during construction and demolition would also be expected due to the provision of construction materials and supplies and other related services.

No impacts on social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates due to population increases would be anticipated during construction and demolition activities and the operation of the proposed MOUNTAINVIEW facility. Short-term population increases during construction and demolition would not be expected to occur because construction and demolition workers would likely be existing local residents. The proposed MOUNTAINVIEW facility would have capacity to accommodate up to 850 personnel that would work across three shifts. Most of these personnel would transfer from the existing NSAC facility; however, approximately 100 personnel would be hired over a 10-year period following construction. Therefore, the Proposed Action would result in a minor, long-term increase of personnel at Buckley AFB. However, it would not be expected that this population increase would result in adverse effects on property values, school enrollment, county or municipal expenditures, or crime rates. The 100 additional personnel is a small quantity that would be added over the course of 10 years. Furthermore, it is likely that some of the additional personnel could be supplied by local residents already in the ROI or the Denver metropolitan area.

The ROI has a slightly higher percentage of residents of a racial minority and children under the age of 5 years old than the City of Aurora (36.1 percent vs. 31.1 percent and 9.5 percent vs. 8.1 percent, respectively). The ROI has a slightly lower percentage of Hispanic or Latino and low-income residents than the City of Aurora (18.3 percent vs. 19.8 percent and 8.8 percent vs. 8.9 percent, respectively). Therefore, the Proposed Action would not be expected to disproportionately impact minority or low-income populations.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.8.2** would continue. The existing NSAC facility would continue to operate from

the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any adverse socioeconomic or environmental justice impacts.

4.9 Transportation and Infrastructure

4.9.1 Evaluation Criteria

Effects on infrastructure are evaluated based on their potential for disruption, excessive use, or improvement of existing level of service for transportation resources, energy and water consumption, sanitary sewer and wastewater systems, storm water systems, communications, and solid waste management. Effects might arise from physical changes to traffic circulation and utility needs created by either direct or indirect workforce and population changes related to installation activities. Assessing impacts on utilities entails a determination of utilities that would be used as a result of the Proposed Action.

An effect on infrastructure would be significant if the Proposed Action resulted in the following effects:

- Exceeded capacity of a utility or transportation artery
- A long-term interruption of the utility or transportation artery
- A violation of a permit condition
- A violation of an approved plan for that utility.

4.9.2 Environmental Consequences

Proposed Action

Transportation. There are two periods of interest related to the Proposed Action, the construction/demolition period and the full occupancy period.

Construction activities have the potential to impact the transportation system through traffic delays. Short-term, minor, direct, adverse impacts on traffic due to delays are anticipated due to slow-moving equipment using existing roadways and trenching of utilities within the roadways, if necessary. Early coordination with Buckley AFB organizations would ensure necessary safety precautions are taken, and would allow ample advance notice to affected commuters and personnel.

In order to determine the potential effects of the full occupancy period of the proposed MOUNTAINVIEW facility, an assessment of future traffic operations was performed. For a facility of this nature, the evening peak hour of the day is the generally accepted time period in which to assess traffic operations. To estimate daily and evening peak-hour vehicle trips generated by new personnel, the standard practice is to consult the Institute of Transportation Engineers Trip Generation Manual, 8th edition. This document, recognized as the industry standard for estimating new vehicle trips, lists a trip rate of 3.32 trips/employee for a weekday and 0.46 trips/employee in the evening peak hour for a general office building. Based on this, at full occupancy, with the additional 100 personnel (spread evenly over three shifts), the Proposed Action would be expected to generate an additional 332 trips (100 employees multiplied by 3.32 trips/employee) per weekday and 30 trips (66 first- and second-shift employees multiplied by 0.46 trips/employee) in the evening peak hour.

All new employees would arrive and leave Buckley AFB via the 6th Avenue and Mississippi Gates. For this analysis, 60 percent of new trips (40 trips in the evening peak hour) are assumed to use the

6th Avenue Gate and 40 percent of new trips (26 trips in the evening peak hour) are assumed to use the Mississippi Gate. Based on an additional 100 employees spread across three shifts, implementation of the Proposed Action would be expected to have a long-term, negligible, direct, adverse impact on transportation.

Heating and Cooling. As stated in **Section 2.2**, the proposed operations building would measure approximately 201,000 ft^2 with two aboveground floors and a basement. The operations building would be heated using a natural gas-fired hot water boiler system. The proposed chiller plant would measure approximately 5,000 ft^2 and contain four, electronically driven, 500-ton chillers. The chillers would provide chilled water to cool equipment and the interior of the proposed operations building. The chillers would use R-134a, a refrigerant with no Class I or Class II ozone-depleting substances. The chiller plant would require a reliable water supply and would be heated and cooled via electric, split system heat pumps. The power plant also would be heated and cooled using electric, split system heat pumps. The three buildings of the proposed MOUNTAINVIEW facility would be designed to be expandable and to achieve an energy efficiency rating of LEED Silver at a minimum and would target a rating of LEED Gold. This would result in a long-term, moderate, direct, beneficial impact on energy efficiency compared to the existing NSAC facility.

Power Supply. Any buried electrical lines within the Proposed Action construction area would be relocated and upgraded as necessary to accommodate the proposed MOUNTAINVIEW facility, which would result in a short-term, negligible, direct, adverse impact on the power system from temporary disruptions. Additionally, electrical disruptions associated with demolition of the existing NSAC facility would result in short-term, negligible, direct, adverse impacts on the power system.

As discussed in **Section 2.2**, the three buildings of the proposed facility would be designed to achieve an energy efficiency rating of LEED Silver at a minimum and would target a rating of LEED Gold. The incorporation of sustainable design techniques and development characteristics associated with the LEED certification process would lessen energy demands at the MOUNTAINVIEW facility. Demolition of the existing NSAC facility and replacing these buildings with energy-efficient structures would result in a long-term, minor to moderate, direct, beneficial impact on the power supply system.

As discussed in **Section 2.2**, a new three-phase electrical feeder would be constructed in coordination with Xcel Energy to provide electrical power to the proposed facility. The proposed electrical feeder would be sized for 18.5 MW. The electrical feeder would be trenched between the proposed pad-mounted switch and the proposed power plant. This would result in a short-term, negligible, direct, adverse impact on the power supply system due to the potential for a temporary disruption of service.

The complete build-out would meet all directed and objective, near-term growth requirements, allowing support of all electrical power requirements. It is anticipated that 6.45 MW of power would be required to meet the projected demands of the proposed MOUNTAINVIEW facility, which would result in an increased power demand of up to 4,644 MWh/month; however, this would be offset by the reduction in power demand associated with demolition of the existing NSAC facility. Implementation of the Proposed Action would be within Buckley AFB's contracted electrical capacity and result in a long-term, minor, direct, adverse impact on the power supply system.

The proposed power plant would contain up to 10 2.5-MW, diesel-driven, electrical contingency generators and one low-wattage emergency generator for emergencies. The 10 2.5-MW contingency generators are anticipated to be used for up to 3,700 hours per year. The low-wattage emergency generator would provide a short-term supply of electricity in an emergency situation. The proposed generators would result in a long-term, minor, direct, beneficial impact on the reliability of the power supply system for the proposed MOUNTAINVIEW facility.

Natural Gas Supply. The existing natural gas line within the Proposed Action construction area would be relocated and upgraded as necessary to accommodate the operations building, which would result in a short-term, negligible, direct, adverse impact on the natural gas system.

The operations building would consume natural gas due to the boilers. Based on the annual use of natural gas at Buckley AFB of 55 cubic feet per square foot of building space, the proposed operations building (201,000 ft^2) is estimated to use 11 mcf of natural gas per year, which would increase the natural gas used at Buckley AFB by approximately 1 mcf/month or 0.6 percent. Long-term, negligible, direct, adverse impacts on the natural gas supply would be expected from implementation of the Proposed Action.

Communications System. Building communications service would be brought into the operations building via a protected distribution system from Building D within the ADF-C. The pathway between Building D and the operations building would be an underground ductbank. The operations building telecommunications network would be expanded to the chiller plant and power plant via underground distribution for monitoring and communications. The legacy cable television and public address systems would be extended from Building D via the communications duct bank to be distributed throughout the operations building. The Mass Notification System would be combined with the Fire Protection System and would be compatible and integrated with the existing system (USACE 2010). Trenching would be required for placement of new fiber optic cable and communications systems. A short-term, negligible, direct, adverse impact on the communications systems would result from construction activities. However, a long-term, negligible, direct, beneficial impact would result from the upgraded communications system for the operation of the proposed MOUNTAINVIEW facility.

Liquid Fuel Supply. Minimal amounts of petroleum would be required for construction equipment during construction and demolition activities and would be brought on site by contractors and removed when construction and demolition activities are complete. Short-term, minor, direct, adverse impacts on liquid fuels would be expected from the construction and demolition activities.

The 2.5-MW, non-emergency, diesel-driven, electrical generators are anticipated to require 20,000 gallons of liquid fuel per day. The proposed MOUNTAINVIEW facility would be constructed to provide storage provisions for a 3-day supply of diesel fuel oil number 2. Therefore, approximately 60,000 gallons of diesel fuel oil would need to be stored on site at any one time. Four 20,000-gallon, double-walled, steel ASTs would be installed on a concrete pad to provide the necessary storage provisions and to account for storage tank headspace requirements. Based on the anticipation that the generators would be used up to 3,700 hours per year, this would result in an increased use of approximately 308,000 gallons of diesel fuel annually (based on one generator using 83.3 gallons of diesel fuel per hour). Implementation of the Proposed Action would result in a long-term, minor, indirect, adverse impact from the increased liquid fuel storage volumes at Buckley AFB. Additional information regarding impacts from liquid fuel ASTs are presented in **Section 4.10.2**.

Water Supply. The existing potable water pipes within the Proposed Action construction area would be relocated and upgraded as necessary to accommodate the proposed MOUNTAINVIEW facility, which would result in a short-term, negligible, direct, adverse impact on the water system.

As discussed in **Section 2.2**, the three buildings of the proposed facility would be designed to achieve an energy efficiency rating of LEED Silver at a minimum and would target a rating of LEED Gold. The incorporation of sustainable design techniques and development characteristics associated with the LEED certification process would lessen water demands at the proposed MOUNTAINVIEW facility.

Construction of the proposed MOUNTAINVIEW facility and demolition of the existing NSAC facility would require water for dust suppression. Short-term, minor, direct, adverse impacts on the water supply

would be expected as a result of the proposed construction and demolition activities. Based on previous activities at Buckley AFB, approximately 500 gallons/acre/day could be used for dust suppression (BAFB 2006b). Approximately 22 acres of ground would be disturbed at Buckley AFB during construction, potentially requiring approximately 11,550 gallons/day for dust suppression during construction. In relation to the use of 352,000 gpd of water throughout Buckley AFB, the construction activities would represent a negligible increase in water demand. Control techniques such as chemical stabilization or reduction of surface wind speed with windbreaks (e.g., snow fence, silt fence) or source enclosure (e.g., netting, mulching) could be employed to suppress dust generation and migration without the use of water (BAFB 2006b). Therefore, short-term, negligible, direct, adverse impacts on the Buckley AFB and City of Aurora water supply would be expected from implementation of the Proposed Action.

The additional infrastructure and personnel increase projected for the MOUNTAINVIEW facility would increase the demand for potable water. Additional water supply would be required for the proposed operations building, chiller plant, and power plant. It is estimated that the average potable water requirements for the operations building (105 gpm), chiller plant (76 gpm), and power plant (20 gpm) would be 290,000 gpd. Peak water requirements for the operations building (310 gpm), chiller plant (111 gpm), and power plant (62 gpm) would be 696,000 gpd. Based on an increased average use of 290,000 gpd for the MOUNTAINVIEW facility and a decreased use of 18,750 gpd from discontinued use of the NSAC facility, implementation of the Proposed Action would result in an increased water demand of approximately 271,250 gpd, which is an approximately 77 percent increase in water demand at Buckley AFB, well within its capacity of 7 mgd, and a 0.8 percent increase in water demand within the Aurora Water service area. Therefore, the Proposed Action would result in a long-term, moderate, direct, adverse impact on water demand within Buckley AFB and a long-term, negligible, direct, adverse impact on regional water demand within the Aurora Water service area.

Sanitary Sewer and Wastewater Treatment. Existing sanitary sewer pipes within the Proposed Action construction area would be relocated and upgraded as necessary to accommodate the MOUNTAINVIEW facility. Additionally, a sanitary sewer lift station would be installed for the operations building. These actions would result in a short-term, negligible, direct, adverse impact on the sanitary sewer system. During construction, the contractor would perform all necessary utility installation in accordance with Buckley AFB requirements and the City of Aurora Code of Ordinances.

The additional infrastructure and personnel increase projected for the MOUNTAINVIEW facility would increase the sewer and wastewater needs. It is assumed that all 290,000 gpd of potable water needed for the proposed MOUNTAINVIEW facility would enter the wastewater system. Based on an increased use of 290,000 gpd for the proposed MOUNTAINVIEW facility and a decreased use of 18,750 gpd from discontinued use of the NSAC facility, implementation of the Proposed Action would result in an increased sewer and wastewater demand of approximately 271,250 gpd, which is an approximately 123 percent increase in wastewater at Buckley AFB and a 0.19 percent increase in wastewater within the MWRD service area. Therefore, the Proposed Action would result in a long-term, moderate, direct, adverse impact on the wastewater system within Buckley AFB and a long-term, negligible, direct, adverse impact on the regional wastewater system within the MWRD service area.

The existing Wastewater Contribution Permit issued by the MWRD might need to be revised to account for the increased quantities of wastewater.

Storm Water. The storm water conveyance system at the proposed MOUNTAINVIEW facility under the Proposed Action would consist of swales, underground piping, culverts, manholes, and inlets. Low-impact development strategies would be implemented to comply with EISA Section 438 and Buckley AFB's MS4 Permit. In addition, guidance would be considered from resources such as the Urban Drainage and Flood Control District (UDFCD), City of Aurora, and LEED requirements. Pervious

pavement is allowable for the parking area. Sheet flow from grass-covered areas onto paved areas would be minimized, and sheet flow from paved areas onto grass-covered areas would be maximized. The existing drainage ditch north of Building D would be relocated further north and travel west along the perimeter fence. The drainage ditch would tie into the existing culverts along the west side of the perimeter fence (USACE 2010).

The discharge of storm water runoff from construction activities on Buckley AFB must be authorized by a separate construction water permit issued by the USEPA in accordance with the *General Permit for Storm Water Discharges from Construction Activities* (i.e., CGP). The permit requires the development and implementation of a construction-specific SWPPP for construction activities at the installation totaling 1 acre or more and where storm water discharges from the construction area enter an MS4 system that leads to natural drainage channels or streams classified as surface waters of the United States (BAFB 2009b).

The discharge of storm water runoff from construction activities off-base must be authorized by a construction water permit issued by the CDPHE in accordance with the *General Permit for Stormwater Discharges Associated with Construction Activity (COR-030000)* and the City of Aurora's *Stormwater Quality Discharge Permit for Construction Activities*. The permit requires the development and implementation of a SWMP.

Implementation of the Proposed Action would create approximately 6 acres of new impervious surfaces from a 7-acre increase for construction of the proposed MOUNTAINVIEW facility and a 1-acre decrease for demolition of the existing NSAC facility. Storm water management controls would be designed and implemented consistent with construction storm water permit requirements and the Air Force Engineering Technical Letter (ETL) 03-1: *Storm Water Construction Standards* to minimize potential adverse effects on surface waters associated with the increased impervious surfaces. Compliance with Air Force ETL 03-1 requires implementation of BMPs to reduce site storm water discharges and pollutant loadings to preconstruction levels or better. A storm water-control site plan would be required and must contain an NPDES permit declaration.

BMPs would also be implemented to decrease sedimentation from erosion. Preventive BMPs include limiting stockpiling of materials on site; managing stockpiled materials to minimize the time between delivery and use; covering stockpiled materials with tarps; installing snow or silt fences around material stockpiles, storm water drainage routes, culverts, and drains; installing fabric filters, netting, and mulching around material stockpiles, storm water drainage routes, culverts, and drains; revegetation of disturbed areas with native species as soon as possible upon completion of construction to stabilize topsoil and prevent water erosion; using rip rap in areas susceptible to erosion; and using a sedimentation basin for collection of runoff to allow suspended solids to precipitate out of solution to improve surface water quality.

The storm water resulting from implementation of the Proposed Action would need to meet the MS4; EISA Section 438; and Federal, state, and local regulations. With implementation of BMPs and adhering to the SWPPP and SWMP, construction activities would create a short-term, minor, direct, adverse impact on the storm water system. A long-term, negligible, direct, adverse impact would result from operation of the proposed MOUNTAINVIEW facility with implementation and maintenance of the BMPs put in place during construction activities.

Solid Waste. The generation of solid, nonhazardous waste, and construction and demolition debris would increase as a result of construction and demolition activities and would result in a short-term, minor, direct, adverse impact. In addition, maintenance of the new generators and chillers would result in a small amount of nonhazardous waste. Some waste generated from the Proposed Action could be recycled

(e.g., concrete, asphalt, paving, metals). Reuse or recycling of appropriate materials would reduce the amount of solid waste disposed of at landfills. Debris that is not recycled and placed in a landfill would result in a long-term, minor, adverse impact.

Contractors hired for the various construction projects would be responsible for the removal and disposal of their construction wastes generated on site. According to the Code of Ordinances for the City of Aurora, Colorado (Volume I, Part II, Chapter 114, Article II, Section 114-34), it is unlawful for the owner, agent, or contractor in charge of any construction or demolition site to cause, maintain, or allow the accumulation of any litter on the site before, during, or after completion of the construction or demolition activities. All construction contractors would be required to adhere to this standard.

Table 4-8 presents the estimated construction and demolition wastes that would be generated from the Proposed Action; however, the numbers are conservative because the NSAC facility would be recycled to the greatest extent possible. Additionally, asphalt from the removal of the 18 parking spots would be used on site or taken to a recycled asphalt pavement center for reuse. A short-term, moderate, direct, adverse impact on solid waste would result from the proposed construction and demolition activities associated with the Proposed Action.

Table 4-8. Quantities of Construction and Demolition Debris Generated from the Proposed Action

Project	Total Square Footage	Multiplier (pounds/ft²)	Debris Generated	
			(pounds)	(tons)
Construction of Operations Building	201,000	4.34	872,340	436
Construction of Chiller Plant	5,000	4.34	21,700	11
Construction of Power Plant	19,000	4.34	82,460	41
Demolition of NSAC facility	50,000	158	7,900,000	3,950
		TOTAL	**8,876,500**	**4,438**

Source: USEPA 2009b

There would be a slight increase in universal wastes such as fluorescent bulbs due to the increase in personnel and facilities. Adherence to USAF, Federal, and state guidelines on energy efficiency and conservation, and plans and programs established at Buckley AFB, would ensure that pollution prevention goals are met.

The increase of approximately 100 people over the 10-year period on Buckley AFB would result in a long-term, negligible, direct, adverse impact on solid waste generation.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.9.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result any infrastructure impacts.

4.10 Hazardous Materials and Wastes

4.10.1 Evaluation Criteria

Impacts on hazardous materials and waste were assessed by evaluating the degree to which the Proposed Action could cause worker, resident, or visitor exposure to hazardous materials or waste; whether the Proposed Action would lead to noncompliance with applicable Federal and state regulations or increase the amounts generated or procured beyond current waste management procedures and capacities; and whether the Proposed Action would disturb an ERP site or create or contribute to an ERP site resulting in adverse effects on human health or the environment.

4.10.2 Environmental Consequences

Proposed Action

Hazardous Materials. The use of hazardous materials in construction equipment would be in accordance with practices established at Buckley AFB and its HAZMART. The construction contractor would be required to develop and submit to Buckley AFB a site-specific Tier I SPCC Plan and submit Material Safety Data Sheets to Buckley AFB for approval of all hazardous materials prior to bringing them on the installation. It is approximately a 2-week process for review and approval. Contractors would be responsible for the management of hazardous materials in accordance with Federal, state, and local regulations. BMPs would be followed to ensure that contamination from a spill does not occur. If, however, a POL spill occurs, the appropriate measures as outlined in the site-specific SPCC Plan would be followed. The contractor would be responsible for all appropriate clean-up measures should a spill occur. This would result in a short-term, minor, direct, adverse impact on hazardous materials during the construction/demolition period.

Quantities of hazardous materials and chemical purchases and energy consumption would increase during construction activities. The expansion to the electrical systems to support the additional personnel would remain PCB-free.

There would be no new hazardous or toxic substances used or stored at the proposed MOUNTAINVIEW facility. Small amounts of nonhazardous wastes would be generated from maintenance of the new generators. The majority of the new personnel to support the proposed MOUNTAINVIEW facility would be administrative in nature and would not require the use of hazardous materials except for normal office supplies and materials. This would result in a long-term, negligible, direct, adverse impact on hazardous materials during the full-occupancy period.

Most construction practices do not involve substantial uses of hazardous materials. Hazardous materials used in construction include solvents, sealants, adhesives, and welding gases; and POL to operate equipment. In accordance with AFI 32-7086 (Section 2.5), the use of hazardous materials by contractors must be authorized prior to their use or being brought onto the installation.

Hazardous Waste. Contractors would be responsible for the management and disposal of hazardous waste in accordance with Federal and state regulations and the Buckley AFB Hazardous Waste Management Program. All hazardous waste manifests shall be signed by Buckley AFB personnel. Quantities of off-installation transport of hazardous waste would increase during construction/demolition activities. This would result in a short-term, minor, direct, adverse impact on hazardous waste during the construction/demolition period.

Due to the need for proper soil conditions beneath the structures of the proposed MOUNTAINVIEW facility, it is assumed that any fill material within the footprint of the facility features would be removed and properly disposed of at an off-installation construction and demolition landfill. Therefore, any hazardous wastes associated with the fill material would be removed and disposed.

Operation of the proposed power plant and chiller plant would result in minimal quantities of hazardous waste from maintenance activities.

Because the majority of the new personnel to support the proposed MOUNTAINVIEW facility would be administrative in nature, no additional effects on hazardous waste from personnel would be expected during the full-occupancy period.

There would be a slight increase in universal wastes such as fluorescent lamps due to the increase in personnel and facilities. This would result in a long-term, negligible, adverse impact on universal wastes during the full-occupancy period. Adherence to USAF guidelines on energy efficiency and conservation, and plans and programs established at Buckley AFB, would ensure that pollution prevention goals are met.

Storage Tanks. Temporary storage tanks might be necessary for fueling of construction equipment during the construction and demolition activities. Contractors would be required to follow, prepare, and adhere to a site-specific SPCC plan prior to the start of construction activities. Contractors must coordinate with the 460th CES/CEAN Hazardous Materials Program Manager for approval of all intended hazardous materials and storage tank uses.

Four 20,000-gallon capacity ASTs would be required for the storage of diesel fuel for the proposed generators. The proposed generators are anticipated to require 20,000 gallons of liquid fuel per day and a 3-day supply of liquid fuel would be required. The additional 20,000 gallons of storage provisions would be available to account for storage tank headspace requirements (e.g., ASTs cannot be filled more than 95 percent or completely emptied). The ASTs would require an installation permit and would need to be registered with the Colorado Division of Labor and Employment – Division of Oil and Public Safety. Consumption of diesel fuel would increase, which would increase the frequency of delivery loads of diesel fuel on the installation. The diesel fuel off-loading areas and the ASTs would be equipped with secondary containment systems. Therefore, increasing inventory and delivery frequency would not increase the risk of contamination associated with spills. This would result in a long-term, minor, indirect, adverse impact on POL during the full-occupancy period. In accordance with 40 CFR 112.5, revisions to the SPCC Plan would be required for any new storage tanks (BAFB 2007b).

Environmental Restoration Program. No ERP, AOC, or potential AOC sites would be disturbed on Buckley AFB due to implementation of the Proposed Action.

The proposed off-base portion of the electric feeder line would encroach on Buckley AFB ERP Site 10. However, during discussions between Xcel Energy and CDPHE on potential impacts to ERP Site 10 based on the route, CDPHE expressed no concern to an electric feeder line installed at a depth of approximately 5 feet. CDPHE stated that groundwater contamination at ERP Site 10 exists at approximate 18 to 22 feet below ground surface; therefore, installation of the electric feeder line to a depth of 5 feet should not impact on-going remediation efforts at ERP Site 10.

Asbestos-Containing Material. Because the Proposed Action construction and demolition areas are associated with former historic facilities, procedures from the Buckley AFB Soil Characterization and Management Plan (BAFB 2010d) would be followed. Prior to conducting any soil-disturbing activities, a visual survey of the proposed disturbance area would be conducted by a trained asbestos building

inspector (ABI). If visible asbestos is present, the site would be classified as an area with known asbestos-containing soils/materials, and the notification process would be implemented. If no visible asbestos is detected during the visual survey, the project would move forward as planned. However, if any unexpected construction debris is encountered during the soil-disturbing activities, all site work would cease and the site would be re-evaluated. The ABI would perform another inspection to determine if visible asbestos is present (BAFB 2010d).

Colorado regulations require all persons engaged in earth-disturbing activities be trained to recognize ACMs. Should debris containing ACM be discovered during site preparation and excavation, work would stop immediately and measures would be taken to secure the area and prevent the release of ACM. Buckley AFB would coordinate with CDPHE to determine the appropriate measures and all applicable Federal, state, and local regulations would be followed for proper remediation and disposal. Therefore, this could result in a short-term, moderate, direct, adverse impact during construction activities. Specifications for the proposed construction activities and USAF regulations prohibit the use of ACM for new construction.

Due to the need for proper soil conditions beneath the structures of the proposed MOUNTAINVIEW facility, it is assumed that any fill material within the footprint of the facility features would be removed and properly disposed of at an off-installation construction and demolition landfill. Therefore, any ACM associated with the fill material would be removed and disposed.

Lead-Based Paint. Should debris containing LBP be discovered during site preparation and excavation, work would stop immediately and measures would be taken to secure the area and prevent the release of lead. Buckley AFB would coordinate with CDPHE to determine the appropriate measures and all applicable Federal, state, and local regulations would be followed for proper remediation and disposal.

Should debris containing LBP be discovered during site excavation, it would be removed according to applicable Federal, state, and local regulations. Therefore, this could result in a short-term, moderate, direct, adverse impact during construction activities. Specification for the proposed construction activities and USAF regulations prohibit the use of LBP for new construction.

Due to the need for proper soil conditions beneath the structures of the proposed MOUNTAINVIEW facility, it is assumed that any fill material within the footprint of the facility features would be removed and properly disposed of at an off-installation construction and demolition landfill. Therefore, any LBP associated with the fill material would be removed and disposed.

Polychlorinated Biphenyls. No impacts on PCBs would be expected from implementation of the Proposed Action.

Pesticides. No impacts on pesticides would be expected from implementation of the Proposed Action.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and the existing conditions discussed under **Section 3.10.2** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any hazardous materials and waste impacts.

5. Cumulative and Adverse Impacts

5.1 Cumulative Impacts Analysis

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

The geographic ROI is an important consideration when discussing cumulative effects. For the purpose of this analysis, the ROI was determined to be Buckley AFB and the City of Aurora. Buckley AFB is in the northeast part of the City of Aurora, along the eastern fringe of the city's developed core. Present land use in the vicinity of Buckley AFB is composed of light industrial and residential uses to the northwest, west, and southwest; and agricultural, undeveloped space, and grassland conservation areas to the northeast, east, and southeast. The City of Aurora's 2009 Comprehensive Plan identifies three planning areas in the vicinity of Buckley AFB, each containing its own planned development pattern (City of Aurora 2010).

Colfax Corridor East of I-225/Northeast Colfax Area. This area is along East Colfax Avenue, approximately 1 mile north of Buckley AFB. The properties along East Colfax Avenue tend to include older commercial uses, many of which are vacant. The Northeast Colfax Area comprises established residential neighborhoods and industrial areas to the north and south of the Colfax Corridor. Presently, there are no major development projects proposed in these areas, and proposed development strategies would preserve open space and minimize development outside of existing residential, commercial, and industrial areas (City of Aurora 2010).

I-225 Corridor and City Center Strategic Area. This area comprises the I-225 Corridor and the City Center, both of which are approximately 3 miles west of Buckley AFB. The I-225 Corridor is lined with regional office and retail centers and older and newly established residential areas. The City Center is composed of regional office, retail, and government administration facilities, including the recently completed City of Aurora Municipal Center, Arapahoe County Administrative Annex, and Aurora Mall. Several additional projects have been proposed for the City Center, including multiple residential apartment and townhouse complexes, corporate office buildings, and a regional bus transfer facility. The I-225 LRT corridor is projected for completion by 2019 (City of Aurora 2010).

E-470 Corridor Strategic Area. This area is adjacent to the eastern and extreme southern boundary of Buckley AFB and includes the prairie areas east of the developed portion of the city where development is expected through 2020. In 2005, the city was projecting that 70 percent of its population growth to the year 2015 would occur in this corridor. Between 2003 and July 2009, 73 percent of newly built residential units were in this area. The major feature of this area is the E-470 Corridor from DIA in the north to Douglas County in the south. E-470 runs north-south near the eastern boundary of Buckley AFB. The E-470 toll road also provides a major regional beltway connecting the northern and southern limits of the metropolitan area and linking DIA with the I-25 Corridor, opening significant amounts of vacant land for development. The E-470 Corridor provides a critical opportunity for high-quality economic development and new neighborhoods. This corridor is the place where much of Aurora's new development will occur in the near future. Strategies for development in the E-470 Corridor include residential, recreation/entertainment, major office park, retail centers, and airport-related activities in the

corridor and working with the counties to ensure that critical, undeveloped land in the corridor is annexed into Aurora (City of Aurora 2010).

Buckley AFB. Buckley AFB has in place a General Plan, one chapter of which is dedicated to land use planning to guide current and future development on the installation. Land use planning at Buckley AFB follows a rational and sequential decisionmaking process to reach a consensus for future growth while ensuring the efficient and compatible use of available land. The General Plan establishes long-range land use planning goals, including defining the most appropriate layout of land uses and transportation corridors to support functional effectiveness, efficiency, and compatibility. Both on- and off-installation factors are considered. The General Plan is intended to guide infill development on currently vacant land, and functional consolidation and redesignation of land uses to accommodate anticipated increases in staffing levels (BAFB 2003a).

Proposed Action

There are a number of recently completed, in progress, and planned capital improvement projects to support Buckley AFB's continuing transition from an Air National Guard Base to an Air Force Base. A summary of the past, present, and reasonably foreseeable future projects in the area of the Proposed Action is presented in **Table 5-1**. Proposed projects include administration buildings, infrastructure upgrades, and training and support facilities. The scope, priority, and schedule of individual projects could change.

Noise. Future planned construction projects on Buckley AFB would coincide with planned phases of construction of the MOUNTAINVIEW facility, which would begin in 2012. It is anticipated that planned construction and demolition projects would be at different locations throughout the installation and impacts from noise related to construction would cease when construction activities are complete. Therefore, short-term, minor, adverse impacts would be expected, but no long-term, cumulative impacts would be expected. It is assumed that the development practices stated in the Base General Plan (BAFB 2003a) would continue to be followed.

No cumulative impacts on the surrounding area would be expected outside of the installation environs. Any construction activities in the ROI and surrounding areas would be short in duration and would not result in a cumulative noise impact.

Land Use. Buckley AFB works to maintain functional relationships with existing land uses by implementing development according to the Base General Plan. The vast majority of future development on Buckley AFB will consist of administrative, light industrial, and community facilities. Implementation of the Proposed Action would result in approximately 6 acres of new building space and associated parking. Construction of the proposed MOUNTAINVIEW facility would not result in any reclassification of land use as the development would take place in an area designated for mission operation and maintenance land use. Implementation of the Proposed Action would constitute a long-term, negligible, adverse impact on land use because no changes to existing land use patterns in the vicinity of the installation would result.

No cumulative impacts on the surrounding area would be expected outside the installation environs. Any construction changes in the ROI and surrounding areas would be short in duration and would not result in cumulative impacts on land use.

Table 5-1. Summary of Current and Proposed Projects in the Area of the Proposed Action

Project Title	Land Use	Size		Status
		Building Area (ft^2)	Parking Area (sy)	
Squadron Operations Facility	Business	35,768	5,000	Currently under construction
Utility Infrastructure Support (Installationwide)	N/A	N/A	N/A	Currently under construction
Consolidated Support Facility	Business	94,940	10,000	FY 2011
Security Forces Operations Facility	Business	35,768	10,000	FY 2011
Fire Trainer	Utility/Miscellaneous	8,000	500	FY 2012/2013
Taxiway Arm/Disarm Pads	N/A	N/A	50,000	FY 2012/2013
Upgrade Taxiways Juliet and Lima	N/A	N/A	50,000	FY 2012/2013
CATM Small Arms Indoor Range	Utility/Miscellaneous	23,735	500	FY 2012/2013
RV Storage Lot	N/A	N/A	5,000	FY 2012/2013
Logistics Readiness Facility	Factory/Industrial	24,650	10,000	FY 2014
Replace AGE/ASE	Business	20,500	500	FY 2015
Repair South Runway	N/A	N/A	59,856	FY 2015
Weapons Live Load/Hot Cargo	N/A	N/A	50,000	FY 2015
Alert Crew Quarters – East Ramp	Business	5,000	500	FY 2015+
Arts, Crafts, and Auto Skills	Factory/Industrial	11,119	1,000	FY 2015+
Athletic Fields	Utility/Miscellaneous	N/A	5,000	FY 2015+
Cold Storage	Factory/Industrial	5,000	500	FY 2015+
Community Activity Center/Bowling	Mercantile	35,600	2,000	FY 2015+
Covered Storage	Factory/Industrial	5,000	500	FY 2015+
Airman Dining Facility	Residential	10,000	500	FY 2015+
Dormitory Three	Residential	25,000	5,000	FY 2015+
Dormitory Four	Residential	25,000	5,000	FY 2015+
Entry Control Facility (6th Avenue)	Business	9,528	1,000	FY 2015+
Entry Control Facility (Mississippi)	Business	9,709	1,000	FY 2015+
Entry Control Facility (Gun Club Road)	Business	9,709	1,000	FY 2015+
Entry Control Facility (Telluride)	Business	6,107	1,000	FY 2015+
Fire/Crash Rescue (Joint with COANG)	Utility/Miscellaneous	23,000	1,000	FY 2015+
Fitness Center Addition	Mercantile	34,207	1,000	FY 2015+
Logistics Readiness Complex/Base Warehouse	Factory/Industrial	55,000	1,000	FY 2015+
Missile Shop	Factory/Industrial	5,000	500	FY 2015+

Project Title	Land Use	Size		Status
		Building Area (ft^2)	Parking Area (sy)	
Missile Storage	Factory/Industrial	5,000	500	FY 2015+
PAX Terminal	Business	5,000	500	FY 2015+
Shopette	Mercantile	7,500	500	FY 2015+
SBIRS Operations Support Facility	Business	10,000	2,000	FY 2015+
Joint Vehicle Maintenance Facility	Factory/Industrial	19,525	5,000	FY 2015+
VQ/TLF – Phase I	Residential	37,950	10,000	FY 2015+
VQ/TLF – Phase II	Residential	39,722	10,000	FY 2015+
Add/Alter Fire Station	Utility/Miscellaneous	21,531	1,000	FY 2015+
Education Center/Library	Business	22,000	2,000	FY 2015+
Demolition Projects				
Consolidated Fuels Storage Area	Factory/Industrial	10,000	555	FY 2010
CATM Range	Utility/Miscellaneous	3,023	3,872	FY 2010
Haz Storage (344), H-70 Hydrazine Storage (310), Entomology (306)	Factory/Industrial	2,140	N/A	N/A
Fuel storage tanks next to Buildings 200 and 341	Factory/Industrial	1,792	N/A	FY 2010
Former Wastewater Treatment Facility	Factory/Industrial	243,778	N/A	FY 2015+
Building 940	Factory/Industrial	14,758	N/A	FY 2015+
Building 1606 (Control Tower) related to construction of Fire Station	Utility/Miscellaneous	8,783	N/A	FY 2015+

Sources: BAFB 2006b, BAFB 2006d, BAFB 2003a, DOD 2007, BAFB 2008d, BAFB 2008e, DOD 2003, DOD 2009c, DOD 2006a, DOD 2009b, DOD 2008, DOD 2005, DOD 2006b, DOD 2009a, BAFB 2008f, BAFB 2005

Key: N/A – Not available; sy – square yard; ft^2 – square feet; FY – Fiscal Year

Air Quality. Past Buckley AFB development and stationary and mobile sources have impacted regional and local air quality and future activities at Buckley AFB would continue to impact local and regional air quality. As shown in **Tables 4-3**, **4-4**, **4-5**, and **4-6**, construction and operation of the MOUNTAINVIEW facility at the Proposed Action areas would contribute a minor amount of emissions to the local and regional air quality. Implementation of the Proposed Action, combined with other current and future projects at Buckley AFB that involve construction, stationary, and mobile source emissions, would result in continuous long-term, minor, adverse cumulative impacts on air quality in the region.

Geological Resources. Past development activities at Buckley AFB and the surrounding City of Aurora have extensively modified geological resources, particularly soils, and current development activities continue to alter the soils. The City of Aurora encompasses approximately 154 square miles. The developed area was calculated at 47.8 square miles in 2008, with another 27.4 square miles of development projected through the year 2035 (City of Aurora 2010). Continued development on Buckley

AFB would locally impact soils and topography through grading, excavation, and recontouring of the soils. Planned development in the areas surrounding Buckley AFB, including the City of Aurora, would also similarly impact geological resources. The Proposed Action would further impact soils; however, because the Proposed Action construction and demolition areas have been previously disturbed, the functionality of the soils would not diminish. Development of 20 acres under the Proposed Action within Buckley AFB represents less than 0.001 percent of the undeveloped land within the City of Aurora. When combined with other past, present, and future activities, permanent but localized effects of the components of the Proposed Action would result in long-term, negligible, adverse, cumulative impacts on geological resources.

Water Resources. Future development of Buckley AFB would have the potential to increase stream sedimentation and would further increase impervious surface area. Potential increases in sedimentation and other water resource degradation from development projects would be alleviated through the use of BMPs. An increase in impervious surfaces would occur; however, impacts on water resources would be minimized through the use of UFC LID design criteria, BMPs, and storm water management controls designed and implemented consistent with NPDES permit requirements and Air Force ETL 03-1: *Storm Water Construction Standards*. The Proposed Action would combine with other past and future development to produce long-term, minor, adverse cumulative impacts on water resources. Implementation of the Proposed Action would result in 6 acres of permanent land development at Buckley AFB. Within the ROI, Toll Gate Creek Watershed, the Urban Drainage and Flood Control District estimates that about 1,553 acres can still be developed in the future (BAFB 2009b). Therefore, proposed development at Buckley AFB related to the Proposed Action represents only 1.5 percent of the remaining land within the ROI available to be developed. This represents a long-term, minor, adverse cumulative impact on surface water within the ROI.

Biological Resources. Existing development and operations on Buckley AFB currently impact plants and animals. The total number of acres to be disturbed or planned for development is relatively small in comparison to the number of acres available to biological resources on the installation. Facility development would eliminate some areas that are currently vegetated, while revegetation of disturbed areas with native species would replace some areas of nonnative vegetation schemes and weedy areas. Conversion of existing open space to facilities would reduce wildlife habitat; however, that habitat is of low quality. Overall black-tailed prairie dog habitat and populations would be reduced, and could indirectly adversely affect burrowing owl habitat and populations. Because Buckley AFB would implement BMPs that would protect wetland areas, potential cumulative adverse impacts on wetlands would be minimized.

Cumulative actions are causing extensive reduction in habitat and permanent loss of prairie vegetation and habitat. Implementation of the Proposed Action would cause an additional permanent loss of 6 acres of prairie habitat/vegetation. Landscaping around the buildings would not replace the prairie habitat as this would change to a more urban habitat that other species would occupy. Past development at Buckley AFB, in conjunction with the urban expansion and development in the City of Aurora, has degraded historic habitat of both sensitive and common species. The Proposed Action, in conjunction with past and future development both on and off the installation, would result in an overall long-term, minor, adverse impact on biological resources.

Cultural Resources. Implementation of the Proposed Action would not adversely affect any culturally significant buildings or structures, including the four NRHP-eligible radomes just south of the existing NSAC facility modular structures, because these buildings would not be directly altered or modified under the Proposed Action. The proposed MOUNTAINVIEW facility would be constructed to be no taller than the existing Building D within the ADF-C; therefore, limited visual impacts on the radomes would be expected. Demolition of the existing NSAC facility would provide slightly better views of the

radomes. A new installation west gate and access road are proposed (this action is analyzed under separate NEPA documentation) that would create a new visual corridor with direct, formal views of the radomes from the west. The new road would terminate at the ADF-C directly facing the radomes. To the west of the ADF-C would be open areas, including ballfields and open space for nearby family housing. Off-installation, the radomes are visible from many miles away, due to the terrain. To the west, the radomes are visible as far away as Lakewood and Golden. The view of the radomes from the west would be enhanced by creation of the more formal visual corridor and open land uses. Construction of the proposed MOUNTAINVIEW facility would not affect the views of the radomes from locations off the installation. No cumulative impacts on cultural resources and viewsheds would result from the implementation of the Proposed Action. There would be no cumulative impacts on historic properties.

Socioeconomics and Environmental Justice. Continued construction and personnel changes on Buckley AFB would impact the ROI and surrounding areas. Construction activities would result in short-term, minor, beneficial impacts when combined with other past, present, and reasonably foreseeable activities on Buckley AFB. In addition, Buckley AFB would gain new personnel from the implementation of the Proposed Action and unrelated projects on Buckley AFB. This increase in personnel, while providing both short-term and long-term, beneficial economic effects on the ROI, would not be a major impact in terms of local or regional employment or other demographics.

Infrastructure. The potential exists for short-term, moderate, adverse cumulative impacts during construction and demolition activities on the transportation system within the ROI. This is based on construction-related traffic increases, and potential road and lane closures associated with construction activities. Implementation of the Proposed Action would result in long-term, minor, adverse, cumulative impacts when combined with other past, present, and reasonably foreseeable activities on the installation.

Short-term, cumulative impacts on utilities would result during construction and demolition activities from additional water used for dust suppression and generation of construction and demolition solid waste. Cumulative impacts on water from use for dust suppression would be short-term as the increased demand for water would end with completion of construction. Short-term, cumulative impacts on water and solid waste would be minor and adverse.

The proposed MOUNTAINVIEW facility would require electric power for heating and cooling, communications equipment, computers, security systems, appliances, and general building and facility lighting. As stated in **Section 4.9.2**, it is anticipated that 6.45 MW of power would be required to meet the projected demands of the proposed MOUNTAINVIEW facility. The increase in electrical use would be supplied by a new 18.5-MW feeder; therefore, the proposed MOUNTAINVIEW facility would make no contribution to cumulative impacts on electrical systems. According to the Base General Plan, the electrical system is currently operating at 70 percent of its capacity (BAFB 2003a). Therefore, when combined with other past, present, and reasonably foreseeable future actions, an increase in the installation's capacity might be necessary. A long-term, moderate, adverse cumulative impact on the electrical distribution system could result.

The on-installation natural gas system has a capacity of approximately 416 mcf/month. In FY 2007, average natural gas usage at Buckley AFB was approximately 173 mcf/month, while peak natural gas usage was approximately 354 mcf/month (BAFB 2007a). Implementation of the Proposed Action would be anticipated to increase natural gas use. When combined with the projects presented in **Table 5-1**, and calculating the overall increased square footage by the annual use of 55 cubic feet per square foot of building space, this would result in an increase of 2.6 mcf/month. Long-term, negligible, adverse cumulative impacts on the natural gas distribution system would result.

The potable water supply available to Buckley AFB, based on paid tap fees, is approximately 959,000 gpd. Average potable water demand at the installation is approximately 352,000 gpd. An increase in usage of 271,250 gpd with the implementation of the Proposed Action, and the estimated increase in usage of 182,600 gpd when combined with the projects presented in **Table 5-1**, would result in an overall increase of 453,850 gpd. This increase, when combined with the average usage of 352,000 gpd, would result in a total usage of 805,850 gpd. When compared to the 35 mgd distributed by the City of Aurora, this would result in a long-term, minor, adverse cumulative impact on the regional water supply system.

Although not all the water consumed at Buckley AFB contributes to the total wastewater discharge rate, it is assumed for the purpose of this analysis that wastewater discharges would be equivalent to water consumption. An increase of 453,850 gpd, when combined with the annual wastewater output in 2006 of 80,329,000 gallons, would result in a total wastewater discharge of 673,929 gpd (BAFB 2007a). When compared to the 185 mgd treated by the MWRD, this would result in a long-term, negligible, adverse cumulative impact on the regional sanitary sewer and wastewater system.

Hazardous Materials and Hazardous Waste. Cumulative impacts from the use of hazardous materials in construction and demolition activities within the ROI would depend on the quantity and nature of the materials used, both of which are unknown. The use of BMPs and adherence to all applicable Federal, state, and local regulations would reduce the cumulative effects from their use.

The cumulative use of hazardous materials in projects on Buckley AFB and surrounding areas would increase; the type and quantity is unknown. The proper use and disposal of these materials would reduce or eliminate any adverse effects from them. As stated previously, the USAF adheres to sustainable building practices. These practices generally use materials that are the least hazardous. For future construction projects, Buckley AFB would implement fewer hazardous materials as replacement materials become available. Therefore, no cumulative impacts on hazardous materials would be expected.

The cumulative generation of hazardous waste from projects at Buckley AFB and surrounding areas would increase; the type and quantity is unknown. The proper disposal of these wastes would reduce any effects from them. Although no particular removal actions for the existing and potential ERP sites are known, it is likely that hazardous wastes would be generated from remediation activities. Similarly, effects from remediation activities would be reduced through proper disposal and BMPs.

Cumulative impacts from the generation of hazardous wastes account for wastes from on-installation activities in combination with off-installation activities. The amount of hazardous waste would be higher at times of construction. The quantity and nature of the wastes generated on a cumulative basis are unknown. Similar to hazardous materials, the implementation of appropriate BMPs and adherence to all applicable Federal, state, and local regulations would reduce the cumulative effects from generation of hazardous wastes. Therefore, no cumulative impacts on hazardous wastes would be expected.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3** would continue. The existing NSAC facility would continue to operate from the outdated modular structures with insufficient space and infrastructure capabilities. No construction or demolition would occur. The No Action Alternative would not result in any cumulative impacts.

5.2 Unavoidable Adverse Impacts

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

Air Quality. Implementation of the Proposed Action would result in temporary particulate emissions due to demolition and construction activities. The increase in standby generator capacity would also result in long-term, adverse impacts on air quality. Although unavoidable, the results of the impact analysis indicate impacts would not be significant.

Geological Resources. Under the Proposed Action, construction activities such as grading, excavating, and recontouring of the soil would result in soil disturbance. Implementation of BMPs during construction would limit potential impacts resulting from construction and demolition activities. Standard erosion-control measures would also reduce potential impacts related to these characteristics. Although unavoidable, impacts on soils would not be considered significant.

Infrastructure. Minor, adverse traffic impacts would be expected as a result of the Proposed Action. These impacts would be the unavoidable consequences of implementing the Proposed Action, but are not considered significant.

Energy supplies would be committed to the Proposed Action. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The construction and demolition activities associated with the Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Increased energy use under the Proposed Action would be slightly higher when compared with current use; however, the three buildings of the proposed facility would be designed to achieve an energy efficiency rating of LEED Silver at a minimum and would target a rating of LEED Gold. The incorporation of sustainable design techniques and development characteristics associated with the LEED certification process would lessen energy demands at the proposed MOUNTAINVIEW facility.

Hazardous Materials and Hazardous Waste. The use of hazardous materials and the generation of hazardous wastes would be unavoidable conditions associated with the Proposed Action. However, the anticipated increase in the use of hazardous materials and the generation of hazardous wastes would not be substantially higher than current usage and generation, and, therefore, is not considered significant.

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

The proposed construction activities would not result in any significant or incompatible land use changes on or off the installation. The Proposed Action has been sited according to existing land use zones. Consequently, construction activities would not be in conflict with installation or City of Aurora land use policies or objectives, except as noted in **Section 4.3**. The Proposed Action would not directly conflict with any applicable off-installation land use ordinances or designated clear zones.

5.4 Relationship Between Short-Term Use and Long-Term Productivity

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

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in significant intensifications of land use at Buckley AFB or the surrounding areas. The loss of wetlands associated with the Proposed Action would be compensated at other areas on Buckley AFB, as noted in **Section 4.6**.

5.5 Irreversible and Irretrievable Commitments of Resources

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

Biological Habitat. The Proposed Action would result in minimal, irreversible loss of vegetation and wildlife habitat. The loss would be minimal and not considered significant on a regional basis.

Material Resources. Material resources used for the Proposed Action would include building materials (for construction of facilities), concrete and asphalt (for roads and parking lots), and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. These include petroleum-based products (such as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

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

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APPENDIX A

APPLICABLE FEDERAL LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A
Applicable Laws, Regulations, Policies, and Planning Criteria

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

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

Airspace Management

Airspace management procedures assist in preventing potential conflicts or accidents associated with aircraft using designated airspace in the United States, including restricted military airspace. Airspace management involves the coordination, integration, and regulation of the use of airspace. The Federal Aviation Administration (FAA) has overall responsibility for managing airspace through a system of flight rules and regulations, airspace management actions, and air traffic control (ATC) procedures. All military and civilian aircraft are subject to Federal Aviation Regulations (FARs). The FAA's *Aeronautical Informational Manual* defines the operational requirements for each of the various types or classes of military and civilian airspace.

Some military services have specific guidance for airspace management. For example, airspace management in the U.S. Air Force (USAF) is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace (SUA). It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace, establishes practices to decrease disturbances from flight operations that might cause adverse public reaction, and provides flying unit commanders with general guidance for dealing with local problems. The U.S. Army, per Army Regulation (AR) 95-2, *Airspace, Airfields/Heliport, Flight Activities, Air Traffic Control and Navigational Aids*, provides similar guidance and procedures for U.S. Army airspace operations.

Noise

Federal, state, and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978, requires compliance with state and local noise laws and ordinances.

The U.S. Department of Housing and Urban Development (HUD), in coordination with the Department of Defense (DOD) and the FAA, has established criteria for acceptable noise levels for aircraft operations relative to various types of land use.

The U.S. Army, through AR 200-1, *Environmental Protection and Enhancement*, implements Federal laws concerning environmental noise form U.S. Army activities. The USAF's Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

Land Use

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activities occurring on a defined parcel of land. In many cases, land use descriptions are codified in local zoning laws. However, there is no nationally recognized convention or uniform terminology for describing land use categories.

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

Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQS) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance and leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment for pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as Air Quality Control Regions (AQCRs). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassified. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

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

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

The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds presented in 40 Code of Federal Regulations (CFR) 93.153. An action is regionally significant

when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

On May 13, 2010, the USEPA issued the Greenhouse Gas (GHG) Tailoring Rule that sets thresholds for GHG emissions from large stationary sources. The new GHG emissions thresholds for large stationary sources define when permits under the New Source Review Prevention of PSD and Title V Operating Permit programs are required for new and existing industrial facilities. Beginning January 2, 2011, large industrial facilities that have CAA permits for non-GHG emissions must also include GHGs in these permits. Beginning July 1, 2011, all new construction or renovations that increase GHG emissions by 75,000 tons of carbon dioxide or equivalent per year or more will be required to obtain construction permits for GHG emissions. Operating permits will be needed by all sources that emit GHGs above 75,000 tons of carbon dioxide or equivalent per year beginning in July 2011.

Health and Safety

Human health and safety relates to workers' health and safety during demolition or construction of facilities, or applies to work conditions during operations of a facility that could expose workers to conditions that pose a health or safety risk. The Federal Occupational Safety and Health Administration (OSHA) issues standards to protect persons from such risks, and the DOD and state and local jurisdictions issue guidance to comply with these OSHA standards. Safety also can refer to safe operations of aircraft or other equipment.

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

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

U.S. Army regulations in AR 385-10, *Army Safety Program*, prescribe policy, responsibilities, and procedures to protect and preserve U.S. Army personnel and property from accidental loss or injury. AR 40-5, *Preventive Medicine*, provides for the promotion of health and the prevention of disease and injury.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 23, 1997), directs Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Federal agencies must also ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

Geology and Soil Resources

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act (FPPA) to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland is

described as soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, and deep or thick effective rooting zones, and that are not subject to periodic flooding. Under the FPPA, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject to the FPPA include Federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

Water Resources

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

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

The USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. As of February 1, 2010, all new construction sites are required to meet the non-numeric effluent limitations and design, install, and maintain effective erosion and sedimentation controls. In addition, construction site owners and operators that disturb 1 or more acres of land are required to use best management practices (BMPs) to ensure that soil disturbed during construction activities does not pollute nearby water bodies. Effective August 1, 2011, construction activities disturbing 20 or more acres must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation is 280 nephelometric turbidity units (ntu). On February 2, 2014, construction site owners and operators that disturb 10 or more acres of land are required to monitor discharges to ensure compliance with effluent limitations as specified by the permitting authority. Construction site owners are encouraged to phase ground-disturbing activities to limit the applicability of the monitoring requirements and the turbidity limitation. The USEPA's limitations are based on its assessment of what specific technologies can

reliably achieve. Permittees can select management practices or technologies that are best suited for site-specific conditions.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines, including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Under Section 307, Federal agency activities that affect any land or water use or natural resource of a coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state's coastal management program.

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

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

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

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), directed the USEPA to issue guidance on Section 438 of the Energy Independence and Security Act (EISA). The EISA establishes into law new storm water design requirements for Federal construction projects that disturb a footprint of greater than 5,000 square feet of land. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology would be calculated and site design would incorporate storm water detention and reuse technologies to the maximum extent technically feasible. Post-construction analyses will be conducted to evaluate the effectiveness of the as-built storm water reduction features. These regulations are applicable to DOD Unified Facilities Criteria. Additional guidance is provided in the USEPA's *Technical Guidance on*

Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act.

EO 13514 also requires Federal agencies to improve water efficiency and management by reducing potable water consumption intensity by 2 percent annually, or by 26 percent, by Fiscal Year (FY) 2020, relative to a FY 2007 baseline. Furthermore, Federal agencies must also reduce agency industrial, landscaping, and agricultural water consumption by 2 percent annually, or 20 percent, by FY 2020, relative to a FY 2010 baseline.

EO 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes* (July 19, 2010), establishes a national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources; enhance the sustainability of ocean and coastal economies; preserve our maritime heritage; support sustainable uses and access; provide for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification; and coordinate with our national security and foreign policy interests.

Biological Resources

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

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

The Sikes Act (16 U.S.C. 670a-670o, 74 Stat. 1052), as amended, Public Law (P.L.) 86-797, approved September 15, 1960, provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. In November 1997, the Sikes Act was amended via the Sikes Act Improvement Amendment (P.L. 105-85, Division B, Title XXIX) to require the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate this program, the amendments require the Secretaries of the military departments to prepare and implement Integrated Natural Resources Management Plans (INRMPs) for

each military installation in the United States unless the absence of significant natural resources on a particular installation makes preparation of a plan for the installation inappropriate. INRMPs must be reviewed by the USFWS and applicable states every 5 years. The National Defense Authorization Act of 2004 modified Section 4(a) (3) of the ESA to preclude the designation of critical habitat on DOD lands that are subject to an INRMP, if the Secretary of the Interior determines in writing that such a plan provides a benefit to the species for which critical habitat is proposed for designation.

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

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

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

Cultural Resources

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

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope,

location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

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

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

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

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

EO 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued to provide for regular and meaningful consultation and collaboration with Native American tribal officials in the development of Federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Native American tribes. EO 13175 recognizes the following fundamental principles: Native American tribes exercise inherent sovereignty over their lands and members, the United States government has a unique trust relationship with Native American tribes

and deals with them on a government-to-government basis, and Native American tribes have the right to self-government and self-determination.

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

Socioeconomics and Environmental Justice

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

Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal "Superfund" to respond to emergencies immediately. Although the "Superfund" provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters. Section 120(h) of CERCLA requires Federal agencies to notify prospective buyers of contaminated Federal properties about the type, quantity, and location of hazardous substances that would be present.

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

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

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

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment. TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for "Asbestos Hazard Emergency Response," which applies only to schools. TSCA Title III, "Indoor Radon Abatement," states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, "Lead Exposure Reduction," directs Federal agencies to "conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards." Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

Energy

The Energy Policy Act (EPAct) of 2005, P.L. 109-58, amended portions of the National Energy Conservation Policy Act and established energy management goals for Federal facilities and fleets. Section 109 of EPAct directs that new Federal buildings (commercial or residential) be designed 30 percent below American Society of Heating, Refrigerating, and Air-Conditioning Engineers standards or the International Energy Code. Section 109 also includes the application of sustainable design principles for new buildings and requires Federal agencies to identify new buildings in their budget requests that meet or exceed the standards. Section 203 of EPAct requires that all Federal agencies'

renewable electricity consumption meet or exceed 3 percent from FY 2007 through FY 2009, with increases to at least 5 percent in FY 2010 through FY 2012 and 7.5 percent in FY 2013 and thereafter. Section 203 also establishes a double credit bonus for Federal agencies if renewable electricity is produced onsite at a Federal facility, on Federal lands, or on Native American lands. Section 204 of EPAct establishes a photovoltaic energy commercialization program for Federal buildings.

EO 13514, *Federal Leadership In Environmental, Energy, And Economic Performance* (dated October 5, 2009), directs Federal agencies to improve water use efficiency and management; implement high performance sustainable Federal building design, construction, operation and management; and advance regional and local integrated planning by identifying and analyzing impacts from energy usage and alternative energy sources. EO 13514 also directs Federal agencies to prepare and implement a Strategic Sustainability Performance Plan to manage its greenhouse gas emissions, water use, pollution prevention, regional development and transportation planning, sustainable building design and promote sustainability in its acquisition of goods and services. Section 2(g) requires new construction, major renovation, or repair and alteration of buildings to comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings. The CEQ regulations at 40 CFR 1502.16(e) directs agencies to consider the energy requirements and conservation potential of various alternatives and mitigation measures.

Section 503(b) of EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, instructs Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. EO 13423 sets goals in energy efficiency, acquisition, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation. Sustainable design measures such as the use of "green" technology (e.g., photovoltaic panels, solar collection, heat recovery systems, wind turbines, green roofs, and habitat-oriented storm water management) would be incorporated where practicable.

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APPENDIX B

AGENCY AND PUBLIC INVOLVEMENT

Department of Defense
9800 Savage Road, Suite 6404
Fort George G. Meade, Maryland 20755

July 7, 2011

MEMORANDUM FOR DISTRIBUTION TO GOVERNMENT AGENCIES

SUBJECT: Environmental Assessment, Project MOUNTAINVIEW Facility, Buckley Air Force Base, Colorado

1. The National Security Agency (NSA) proposes to construct the MOUNTAINVIEW facility within or in the vicinity of Buckley Air Force Base, Colorado. The MOUNTAINVIEW facility would replace the existing NSA-Colorado (NSAC) facility, formerly the Denver Security Operations Center, which would be subsequently demolished. Major components of the Proposed Action include construction of an approximately 201,000-square-foot (ft^2) operations building, 5,000-ft^2 chiller plant, 19,000-ft^2 power plant, four 20,000-gallon capacity aboveground storage tanks (number and size could vary) to contain an operational capacity of 60,000 gallons of diesel fuel, and a 610-vehicle parking lot (adequate for three shifts), as well as the demolition of the existing 50,000-ft^2 NSAC facility. An approximately 1-acre, temporary, gravel contractor personal vehicle parking area would be constructed to support the proposed construction and demolition activities. Following the completion of the proposed construction and demolition activities, the temporary contractor parking area would be returned to natural conditions. The proposed MOUNTAINVIEW facility would house up to 850 personnel, 100 of which could be new hires over the subsequent 10-year period following facility construction.

2. The Environmental Impact Analysis Process for the Proposed Action and No Action Alternative is in accordance with the Council on Environmental Quality guidelines pursuant to the requirements of the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached Environmental Assessment and solicit your comments on the proposal and any potential environmental concerns your office would like to have addressed. Also enclosed is a copy of the distribution list of those Federal, state, and local agencies that have been contacted. If there are any additional agencies that you feel should review and comment on the proposal, please include them in your distribution of this letter and the attached materials.

3. Please provide any comments or information within 30 days from the date shown on this letter by mail to MOUNTAINVIEW Facility EA, c/o HDR Inc., 375 East Elm Street, Suite 110, Conshohocken, Pennsylvania 19428 or by email to Mountainview@hdrinc.com.

4. If there any questions about the project, please contact me at 301-688-2970.

\\signed\\

Jeffrey D. Williams, REM, LEED-AP
Senior Environmental Engineer
ESH Planning and Implementation

1 Attachment:
1. DISTRIBUTION LIST

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Environmental Assessment,
Project MOUNTAINVIEW Facility,
Buckley Air Force Base, Colorado

Interagency and Intergovernmental Coordination for Environmental Planning List

FEDERAL AGENCIES

Mr. David Rathke
U.S. Environmental Protection Agency
Region 8
1595 Wyncoop Street
Denver, CO 80202-1129

Mr. Larry Svoboda
NEPA Unit Chief
U.S. Environmental Protection Agency
Region 8
1595 Wyncoop Street
Denver, CO 80202-1129

Mr. Bruce Rosenlund
Colorado Field Supervisor
U.S. Fish & Wildlife Service
134 Union Blvd., Suite 675
Lakewood, CO 80228-1807

Ms. Patricia Mehlhop
U.S. Fish & Wildlife Service
134 Union Blvd.
Lakewood, CO 80228-180

STATE REPRESENTATIVES

Mr. Dan Beley
Colorado Dept. of Public Health & Environment
Water Quality Control Division
WQCD-OQ-B2
4300 Cherry Creek Drive, South
Denver, CO 80246-1530

Ms. Nancy Chick
Colorado Dept. of Public Health & Environment
Air Pollution Control Division
APCD-TS-B2
4300 Cherry Creek Drive, South
Denver, CO 80246-1530

Mr. Lee Pivonka
Colorado Dept. of Public Health & Environment
Federal Facilities
HMWM 2800
4300 Cherry Creek Drive, South
Denver, CO 80246-1530

Mr. Edward Nichols
State Historic Preservation Officer
Colorado History Museum
1300 Broadway
Denver, CO 80203-2137

Ms. Eliza Moore
Wildlife Manager
Colorado Division of Wildlife
6060 South Broadway
Denver, CO 80216

Mr. Brent Bibles
Wildlife Researcher
Colorado Division of Wildlife
317 W. Prospect Road
Fort Collins, CO 80526

LOCAL REPRESENTATIVES

Mr. John Fernandez
City of Aurora
Environmental Management Section
15151 E. Alameda
Aurora, CO 80012

Mr. Robert Watkins
Director of Planning
City of Aurora
15151 E. Alameda
Aurora, CO 80012

Mr. Eugene Jansak
Industrial Waste Specialist
Metro Wastewater Reclamation Dist.
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Denver, CO 80229-7499

Ms. Carol Foreman
Central Library Reference Supervisor
Aurora Public Library Administrative Offices
14949 E. Alameda Pkwy.
Aurora, CO 80012

City of Aurora

Planning Department
15151 E. Alameda Parkway
Aurora, Colorado 80012
Phone: 303-739-7250
Fax: 303-739-7268
www.auroragov.org

August 2, 2011

Mr. Scott Wilson
460 CES/CEVP
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80111-9551

Dear Mr. Wilson:

Subject: Draft Environmental Assessment for the construction and operation of the MOUNTAINVIEW facility at Buckley Air Force Base (BAFB), Colorado

Staff has reviewed the Environmental Assessment for the construction and operation of the MOUNTAINVIEW facility at BAFB in response to your letter requesting review and comment on the proposed project. Staff concurs that the proposed action is the best alternative for replacing the existing NSA-Colorado facility, formerly the Denver Security Operations Center. The city has no issues or concerns regarding this project. Thank you for the opportunity to comment on this document.

Please contact me at (303) 739-7227 with any questions about this comment.

Sincerely,

R. Porter Ingrum

R. Porter Ingrum
Airport Noise Coordinator
Comprehensive Planning Division

RPI/
cc: J. Fernandez
K. Hancock

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DEPARTMENT OF THE AIR FORCE
460TH SPACE WING (AFSPC)

Laurie Fisher
Environmental Flight
460th Civil Engineer Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Mr. Alonzo Chalepah
Apache Tribe of Oklahoma
PO Box 1220
Anadarko, OK 73005

Subject: Environmental Assessment, Project Mountainview at Buckley Air Force Base, Aurora, Colorado

Dear Mr. Chalepah

In accordance with 36 CFR Part 800, Section 106 of the National Historic Preservation Act (NHPA), the United States Air Force (USAF) requests your review and comment regarding the above-referenced project. Buckley Air Force Base (BAFB) has prepared an environmental assessment (EA) to assess potential environmental and cultural resource impacts for the proposed action.

The USAF proposes to replace the existing Denver Security Operations Center (DSOC) modular structures within the Aerospace Data Facility (ADF) compound at Buckley AFB, Arapahoe County, Colorado. The Proposed Action includes construction of the proposed MOUNTAINVIEW facility followed by demolition of the existing DSOC modular structures. The proposed MOUNTAINVIEW facility would house centralized data processing and office functions within the secure area of the ADF compound. Components of the proposed MOUNTAINVIEW facility include construction of an approximately 201,000-square foot (ft^2) operations building, 5,000-ft^2 chiller plant, 19,000-ft^2 power plant, four 20,000-gallon aboveground storage tanks, and a 650-vehicle parking lot or parking garage, additional capacity power feed, and related utilities. The proposed operations building would have two aboveground floors and a basement and be no taller than the existing ADF compound buildings. The equipment within the chiller plant would provide chilled water for cooling equipment and the facility buildings. The power plant would contain up to 10 2.5-megawatt, diesel-driven, electrical generators and one low-wattage, emergency generator (life safety generator) for emergencies. The parking lot or garage would be no higher than the existing ADF compound buildings. The proposed MOUNTAINVIEW facility would be constructed instead of the larger and previously proposed DSOC facility. The DSOC facility was evaluated in an Environmental Assessment (EA) in 2004. We consulted with the Colorado State Historical Preservation Officer (SHPO) at that time and the SHPO concurred with our determination of no adverse effect for the

GUARDIANS OF THE HIGH FRONTIER

DSOC facility (the only components of the DSOC EA that were implemented are the temporary DSOC modular structures). The existing DSOC modular structures would be removed upon implementation of the currently proposed MOUNTAINVIEW facility. If approved, the proposed MOUNTAINVIEW facility would be constructed beginning in Fiscal Year 2012.

Under 36 CFR Part 800, Proposed Action, Project Mountainview would also have **No Adverse Effect** on the four NRHP-eligible radomes (Buildings 402, 403, 404, and 405). Their exteriors are individually eligible for the NHPA for their architectural and historical significance and would not be directly altered or modified as a result of Proposed Action.

In the unlikely event that cultural resources are encountered within the project area during any ground-disturbing activities, all work in the area will stop until a qualified archaeologist has documented and evaluated the resource for eligibility for the National Register of Historic Places, in compliance with Section 106 of the NHPA. In the event human remains, funerary objects, or Native American sacred objects are discovered, all work in the area will be stopped and the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) will be implemented immediately. These procedures include but are not be limited to: determination of the nature of the remains by a qualified archeologist (crime scene, prehistoric/Native American remains) within 24 hours, contact appropriate tribes or tribal representative, and contact the Colorado SHPO if the remains are determined to be part of larger archeological site.

Please note that this EA is in Preliminary Draft form and this Preliminary Draft EA will be revised before it will be made available to the public. Please provide any comments you may have or any concerns you may have to Mr. Scott Wilson at 720-847-7159, or via e-mail: scott.wilson@buckley.af.mil. Written responses can also be mailed to:

Mr. Scott Wilson
460 CES/CEAO
660 South Aspen Street, Mail Stop 86
Buckley AFB, CO 80011-9564

Please provide any comments you might have by 06 July 2011.

Sincerely

LAURIE FISHER, GS-13, DAFC
Chief, Asset Management Flight

Attachments:
- Project Location Figure
- CD, Draft Environmental Assessment for Project Mountainview at Buckley AFB

Buckley AFB Tribal Coordination List

Mr. Alonzo Chalepah
Apache Tribe of Oklahoma
PO Box 1220
Anadarko, OK 73005

Ms. Darlene Conrad
Northern Arapaho Tribal Historic Preservation Office
PO Box 396
Fort Washakie, WY 82520

Ms. Karen Little Coyote
Coordinator, Cultural Heritage Program
Cheyenne and Arapaho Tribes of Oklahoma
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Mr. Jimmy Arterberry, THPO
Comanche Nation
PO BOX 908
Lawton, Oklahoma 73502

Dana Q. Dupris
Acting Tribal Historic Preservation Officer
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PO Box 590
Eagle Butte, SD 57625

Ms. Lynette Gray
Tribal Historic Preservation Officer
Cheyenne and Arapaho Tribes
Office of Planning and Development
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Ms. Katy Wells
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Mr. Hubert Two Leggins
Cultural Director
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Crow Agency, MT 59022

Mr. Dale Old Horn
Tribal Historic Preservation Officer
Crow Tribe of Indians
Bacheeitche Avenue
PO Box 159
Crow Agency, MT 59022

Mr. Raymond J. Redwing
Tribal Historic Preservation Officer
Flandreau Santee Sioux Tribe
PO Box 283
Flandreau, SD 57028

Mr. Vernon Hill
Cultural Coordinator
Eastern Shoshone Preservation Office
Eastern Shoshone Tribe of Wind River Indian Reservation
PO Box 538
Fort Washakie, WY 82514

Mr. Curley Youpee
Director, Cultural Resources Department
Fort Peck Tribes of Assiniboine and Sioux
PO Box 1027
Poplar, MT 59255

Mr. Michael Darrow
Fort Sill Apache Tribe of Oklahoma
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Apache, OK 73507

Mr. Jeff Blythe
Tribal Historic Preservation Officer
Jicarilla Apache Nation
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Ms. Jamē Lyn Eskew
Kiowa Culture Preservation Authority
Kiowa Tribe of Oklahoma
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Tribal Historic Preservation Officer and Cultural Representative
Northern Cheyenne Tribe of the Northern Cheyenne Reservation
PO Box 128
Lame Deer, MT 5904

Ms. Holly Houghton
Tribal Historic Preservation Officer and NAGPRA Contact
Mescalero Apache Tribe
PO BOX 227
Mescalero, NM 88340

Ms. Clair Green
Cultural Representative
Lower Brule Sioux Tribe
187 Oyate Circle
Lower Brule, SD 57548

Ms. Betsy Chapoose
Director of Cultural Rights and Protection
Northern Ute Indian Tribe of the Uintah and Ouray Ute Reservation
PO Box 190
Duchesne, UT 84026

Mr. Michael Catches Enemy
Oglala Sioux Tribe
Natural Resources Officer
PO Box 320
Pine Ridge, SD 57770

Francis Morris
Repatriation Coordinator
Repatriation and the Tribal Preservation Office
Pawnee Nation of Oklahoma
881 Little Dee Drive
Pawnee, OK 74058

Mr. Russell Eagle Bear
Tribal Historic Preservation Officer
Rosebud Sioux Tribe
PO Box 809
Rosebud, SD 57570

Mr. Frankie Jackson
Tribal Historic Preservation Officer
Council Headquarters/Museum
Santee Sioux Nation
108 Spirit Lake Avenue West
Niobrara, NE 68760

Mr. Neil Cloud
NAGPRA Coordinator
Southern Ute Tribal Council
PO BOX 737
Ignacio, CO 81137

Ms. Waste'win Young
Tribal Historic Preservation Officer
Standing Rock Sioux Tribe
PO Box D
Fort Yates, ND 58538

Mr. Perry Brady
Tribal Historic Preservation Officer
Mandan, Hidatsa, Arikara
Three Affiliated Tribes
404 Frontage Road
New Town, ND 58763

Mr. Terry Knight
Tribal Historic Preservation Officer
Ute Mountain Ute Tribe
125 Mike Wash Road
PO Box JJ
Towaoc, CO 81334

Mr. Stratford Williams
Wichita and Affiliated Tribes
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Anadarko, OK 73005

Ms. Lana Gravatt
Tribal Historic Preservation Officer
Yankton Sioux Tribe
PO Box 248
Marty, SD 57361

DEPARTMENT OF THE AIR FORCE
460TH SPACE WING (AFSPC)

JUN 06 2011

Laurie Fisher
Asset Management Flight
460th Civil Engineering Squadron
660 South Aspen Street, Stop 86
Buckley AFB, CO 80011-9564

Mr. Ed Nichols
State Historic Preservation Officer
Colorado History Museum
1300 Broadway
Denver, CO 80203-2137

Dear Mr. Nichols,

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the Unites States Air Force (USAF) has evaluated the potential effects the Proposed Action at Buckley Air Force Base (BAFB) may have on properties on or meeting the criteria of eligibility for listing to the National Register of Historic Places (NRHP). USAF is requesting Colorado State Historic Preservation Office (SHPO) review of the proposed undertaking and concurrence with our determinations of effect for the Proposed Action pursuant to Section 106 of the NHPA.

In accordance with 36 Code of Federal Regulations (CFR) 800.11, we are submitting the following documentation:

1. A description of the Proposed Action/Proposed Undertaking
2. A description of the Area of Potential Effect (APE)
3. A description of steps taken to identify historic properties
4. A description of the undertaking's effects on historic properties.

Description of the Proposed Action/Proposed Undertaking

The USAF proposes to replace the existing Denver Security Operations Center (DSOC) modular structures within the Aerospace Data Facility (ADF) compound at Buckley AFB, Arapahoe County, Colorado. The Proposed Action includes construction of the proposed MOUNTAINVIEW facility followed by demolition of the existing DSOC modular structures. The proposed MOUNTAINVIEW facility would house centralized data processing and office functions within the secure area of the ADF compound. Components of the proposed MOUNTAINVIEW facility include construction of an approximately 201,000-square foot (ft^2)

operations building, 5,000-ft^2 chiller plant, 19,000-ft^2 power plant, four 20,000-gallon aboveground storage tanks, and a 650-vehicle parking lot or parking garage, additional capacity power feed, and related utilities. The proposed operations building would have two aboveground floors and a basement and be no taller than the existing ADF compound buildings. The equipment within the chiller plant would provide chilled water for cooling equipment and the facility buildings. The power plant would contain up to 10 2.5-megawatt, diesel-driven, electrical generators and one low-wattage, emergency generator (life safety generator) for emergencies. The parking lot or garage would be no higher than the existing ADF compound buildings. The proposed MOUNTAINVIEW facility would be constructed instead of the larger and previously proposed DSOC facility. The DSOC facility was evaluated in an Environmental Assessment (EA) in 2004. We consulted with your office at that time and your office concurred with our determination of no adverse effect for the DSOC facility (the only components of the DSOC EA that were implemented are the temporary DSOC modular structures). The existing DSOC modular structures would be removed upon implementation of the currently proposed MOUNTAINVIEW facility. If approved, the proposed MOUNTAINVIEW facility would be constructed beginning in Fiscal Year 2012.

Figure 1 (attached) presents an aerial view of ADF compound. Figure 2 (attached) illustrates the approximate impact boundaries for the proposed site within the ADF compound.

The Proposed Action. The proposed MOUNTAINVIEW facility would be located at the northern end of the ADF, where grass-covered areas and surface parking are currently located. The proposed operations building would be up to two stories in height in areas, but no higher than the existing ADF buildings. Temporary DSOC modular structures (Buildings 491 and 492) would be removed.

The USAF has determined that the proposed project constitutes an undertaking as defined by 36 CFR Part 800.16(y).

Determination of the Area of Potential Effect (APE)

For the purpose of this analysis, the APE is defined as those areas to be affected by ground-disturbance and those areas within the viewshed of the proposed MOUNTAINVIEW facility at the ADF.

Steps Taken To Identify Historic Properties

Buckley AFB's Integrated Cultural Resources Management Plan (ICRMP) describes the results of the 14 archaeological and architectural inventories conducted within the installation between 1983 and 2004. All of Buckley AFB has been inventoried for buildings, structures, and built historic districts. Six buildings have been determined by Buckley AFB, with the concurrence of the Colorado SHPO, to be individually eligible for the NRHP, all dating to the Cold War era. These buildings are as follows:

- Building 801 (5AH.2274) is a double-bay, arched concrete hangar built for the Navy in 1953. It is eligible for inclusion in the NRHP under Criterion A for its Cold War history and under Criterion C for architectural significance as an unusual type of Navy hangar.
- Building 909 (5AH.2276) is a steel-truss, low-gable hangar built in 1956 for Colorado Air National Guard's jet aircraft and the Air National Guard's only precision-flying team, the Minute Men. It is eligible for inclusion in the NRHP under Criterion A for its significant association with Cold War-era history.
- Buildings 402, 403, 404, and 405 are satellite communications ground terminals (radomes) (exteriors only) constructed between 1970 and 1976 (5AH.2322, 2288, 2289, and 2333, respectively). They are eligible for inclusion in the NRHP under Criterion C for architectural significance as excellent examples of radome construction and under Criterion A for their significant association with Cold War-era history.

Of the six buildings eligible for the NRHP, only the four radomes (Buildings 402-405, inclusive) are within the APE.

All of Buckley AFB has been surveyed for archaeological sites except approximately 150 acres within the ADF. No archaeological sites eligible for inclusion in the NRHP have been identified at Buckley AFB. Within the secure area of the ADF, one small survey (3 acres) has been conducted in the area of the proposed MOUNTAINVIEW project (Hokanson 2004). It identified no archaeological sites or isolates and concluded that the area was disturbed and devoid of archaeological potential. The areas of the ADF proposed for Proposed Action are surface parking, open space, and the existing DSOC modular structures within the secure area.

At this time, there are known no Indian sacred sites or traditional cultural properties at Buckley AFB. No Native American human remains or cultural items have been discovered or reported at Buckley AFB; however, Buckley AFB is beginning to initiate tribal consultation regarding the identification of these resources. According to the ICRMP, the SHPO has concurred that no additional areas outside the secure area remain to be surveyed for archaeological resources. It should be noted that the area encompassed by the ADF appears to be primarily covered by pavement or has been previously disturbed. Therefore, we propose that no pedestrian archaeological survey be conducted. The Standard Operating Procedures outlined in the Buckley AFB ICRMP regarding discovery of archaeological sites and human remains or cultural items would be followed for the Proposed Action.

Determination of Effect on Historic Properties

Under 36 CFR Part 800, Proposed Action would have **No Adverse Effect** on the four NRHP-eligible radomes (Buildings 402, 403, 404, and 405). Their exteriors are individually eligible for the NHPA for their architectural and historical significance and would not be directly altered or modified as a result of Proposed Action. From the northwest corner of the ADF, views across the new development to the radomes may be more distant, but still visible over the new facilities. Removal of temporary modular structures would provide more open views of the radomes from the west. Impacts on cultural and visual resources from implementation of Proposed Action under NEPA would be expected to be minor and long-term; under NHPA, visual effects on cultural resources (historic properties) would not be adverse.

Public Notice: Participation in the Section 106 Process

The USAF recognizes that the views of the public are essential to Federal decision-making throughout the Section 106 process (36 CFR 800.2 (d) (1)). We also recognize that there may be public interest in potential visual impacts to the radomes from the community around Buckley AFB. Therefore, a public notice of availability of the EA being prepared on the proposed Mountainview facility will be published and provided to your office.

Please provide any written comments you may have comments to:

Mr. Scott Wilson
460 CES/CEAO
660 South Aspen Street, Stop 86
Buckley AFB, CO 80011-9564

Comments or questions also may be sent electronically to Scott.wilson@buckley.af.mil or call 720-847-7159.

Scott Wilson - Scott Wilson, GS-12
for
LAURIE FISHER, GS-13, DAF
Chief, Asset Management Flight

Attachments: Figure 1 and Figure 2 of proposed project area

HISTORY Colorado

June 15, 2011

Laurie Fisher
Chief, Asset Management Flight
460th Civil Engineering Squadron
660 South Aspen Street, Stop 86
Buckley AFB, CO 80011

Re: Replacement of existing Denver Security Operations Center. (CHS #59724)

Dear Ms. Fisher:

Thank you for your correspondence dated June 6, 2011 and received by our office on June 8, 2011 regarding the review of the above-mentioned project under Section 106 of the National Historic Preservation Act (Section 106).

After review of the submitted information, we do not object to the proposed Area of Potential Effects (APE) for the project. We concur that resources 5AH.2322, 5AH .2288, 5AH.2289, and 5AH .2333 are eligible for the National Register of Historic Places and located within the APE. After review of the assessment of adverse effect, we concur with the recommended finding of *no adverse effect* [36 CFR 800.5(b)] under Section 106 for the proposed project.

If unidentified archaeological resources are discovered during construction, work must be interrupted until the resources have been evaluated in terms of the National Register criteria, 36 CRF 60.4, in consultation with this office.

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.

If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Manager, at (303) 866-4678.

Sincerely,

Edward C. Nichols
State Historic Preservation Officer

THE COLORADO HISTORICAL SOCIETY
CIVIC CENTER PLAZA 1560 BROADWAY SUITE 400 DENVER COLORADO 80202 www.historycolorado.org

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The following Notice of Availability was published in the *Aurora Sentinel* on 7 July 2011, announcing a public review period for the Draft EA and Draft FONSI/FONPA until 5 August 2011. Copies of the Draft EA and Draft FONSI/FONPA were available in the Aurora Public Library for public review.

PUBLIC NOTICE

Notice of Availability
Draft Finding of No Significant Impact/Finding of No Practical Alternative for the Environmental Assessment, Project MOUNTAINVIEW Facility, Buckley Air Force Base, Colorado

Buckley Air Force Base, Colorado – An Environmental Assessment (EA) addressing the proposed replacement of the National Security Agency-Colorado (NSAC) facility at Buckley Air Force Base, Colorado, is being prepared. The Proposed Action includes construction and operation of the replacement facility, hereinafter referred to as the MOUNTAINVIEW facility, demolition of the existing 50,000-square-foot (ft^2) NSAC facility, and the creation and removal of a temporary contractor parking area. The proposed MOUNTAINVIEW facility would include an approximately 201,000-ft^2 operations building, 5,000-ft^2 chiller plant, 19,000-ft^2 power plant, four 20,000-gallon aboveground storage tanks (number and size could vary) to contain 60,000 gallons of diesel fuel, and a 610-vehicle parking lot (adequate for three shifts). The proposed facility would house up to 850 personnel, 100 of which would be new hires over the subsequent 10-year period following facility construction.

The National Security Agency is proposing to issue a Finding of No Significant Impact (FONSI)/Finding of No Practical Alternative (FONPA) based on the EA. The analysis considered in detail the potential effects of the Proposed Action and the No Action Alternative. Ten resource areas were analyzed including: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. The results, as found in the EA, show that the Proposed Action would not have a significant adverse impact on the environment, indicating that a FONSI/FONPA would be appropriate. An Environmental Impact Statement should not be necessary to implement the Proposed Action.

Copies of the Draft FONSI/FONPA and EA showing the analysis are available for review at the Aurora Pubic Library, 14949 E. Alameda Parkway, Aurora, Colorado 80012. Public comments on the Draft FONSI/FONPA and EA will be accepted through August 5, 2011.

Written comments and inquiries on the Draft FONSI/FONPA and EA should be directed to: MOUNTAINVIEW Facility EA, c/o HDR, Inc., 375 East Elm Street, Suite 110, Conshohocken, Pennsylvania 19428 or by email to Mountainview@hdrinc.com.

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APPENDIX C

AIR QUALITY EMISSIONS CALCULATIONS SPREADSHEET

Summary	Summarizes total emissions by calendar year for the Proposed Action
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
AQCR Tier Report	Summarizes total emissions for the Denver Metropolitan Intrastate Air Quality Control Region Tier report for 2002, to be used to compare the Proposed Action to regional emissions.

Air Quality Emissions from the the Proposed Action

	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	6.516	0.813	2.798	0.412	0.449	0.436	748.363
Fugitive Dust	-	-	-	-	31.233	3.123	-
Commuter	0.110	0.110	0.992	0.001	0.010	0.007	131.482
TOTAL	***6.626***	***0.922***	***3.790***	***0.413***	***31.692***	***3.566***	***879.845***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

CO_2 emissions converted to metric tons =	***798.020***	***metric tons***	
State of Colorado's CO_2 emissions =	***97,500,000***	***metric tons***	*(EIA 2008)*
Percent of Colorado's CO_2 emissions =	***0.001%***	***metric tons***	
United State's CO_2 emissions =	***5,814,400,000***	***metric tons***	*(EIA 2008)*
Percent of Colorado's CO_2 emissions =	***0.000%***	***metric tons***	

Source: U.S. Department of Energy, Energy Information Administration (EIA). 2008. Carbon Dioxide Emissions Summary from Fossil Fuel Consumption (2008). Available online: http://www.eia.doe.gov/oiaf/1605/state/state_emissions.html. Accessed 15 February 2011

Since future year budgets were not readily available, actual 2002 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Denver Metropolitan Intrastate Air Quality Control Region

	Point and Area Sources Combined					
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
2002	115,373	113,628	764,207	38,244	53,909	13,347

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 25 February 2011.

Air Emissions from the Proposed Action
Determination Significance (Significance Threshold = 10% of regional)

	Point and Area Sources Combined					
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Regional Emissions	115,373	113,628	764,207	38,244	53,909	13,347
Emissions	6.63	0.92	3.79	0.41	31.69	3.57
% of Regional	**0.006%**	**0.001%**	**0.000%**	**0.0011%**	**0.059%**	**0.027%**

Combustion Emissions

Combustion Emissions of VOC, NO_x, SO_2, CO, $PM_{2.5}$, $PM_{10,}$ and CO_2 due to Construction and Demolition

	General Construction Activities	**Area Disturbed**		
1.)	Construct Operations Building	140,000	ft^2	Building footprint only
2.)	Construct Generators Building	5,000	ft^3	
3.)	Construct Chiller Plant Building	19,000	ft^4	
4.)	Construct Parking Lot	130,000	ft^2	
5.)	Construct Parking Access Roads and Sidewalks	100,000	ft^3	
6.)	Demolish existing DSOC Modular Structures	50,000	ft^2	
7.)	Other Land Distrubance for Infrastructure, Aboveground Storage Tank Installation, Storm Water Management, and Landscaping	471,000	ft^3	

Total General Construction Area:	164,000	ft^2	(1-3)
	3.8	acres	
Total Demolition Area:	50,000	ft^2	(6)
	1.1	acres	
Total Pavement Area:	230,000	ft^2	(4-5)
	5.3	acres	
Total Disturbed Area:	915,000	ft^2	(1-7)
	21.0	acres	
Construction Duration:	12	months	
Annual Construction Activity:	240	days	Assume 12 months, 4 weeks per month, 5 days per week.

Emission Factors Used for Construction Equipment

References: Guide to Air Quality Assessment, SMAQMD, 2004; and U.S. EPA NONROAD Emissions Model, Version 2005.0.0
Emission factors are taken from the NONROAD model and were provided to e²M by Larry Landman of the Air Quality and Modeling Center (Landman.Larry@epamail.epa.gov) on 12/14/07. Factors provided are for the weighted average US fleet for CY2007.
Assumptions regarding the type and number of equipment are from SMAQMD Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Bulldozer	1	13.60	95.742%	5.50	1.02	0.89	0.87	1456.90
Motor Grader	1	9.69	0.73	3.20	0.80	0.66	0.64	1141.65
Water Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	3	41.64	2.58	15.71	0.83	2.55	2.47	4941.53

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Paver	1	3.83	0.37	2.06	0.28	0.35	0.34	401.93
Roller	1	4.82	0.44	2.51	0.37	0.43	0.42	536.07
Truck	2	36.71	1.79	14.01	3.27	1.99	1.93	4685.95
Total per 10 acres of activity	4	45.37	2.61	18.58	0.91	2.78	2.69	5623.96

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Loader	1	13.45	0.99	5.58	0.95	0.93	0.90	1360.10
Haul Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Total per 10 acres of activity	2	31.81	1.89	12.58	0.64	1.92	1.87	3703.07

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c] (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Stationary								
Generator Set	1	2.38	0.32	1.18	0.15	0.23	0.22	213.06
Industrial Saw	1	2.62	0.32	1.97	0.20	0.32	0.31	291.92
Welder	1	1.12	0.38	1.50	0.08	0.23	0.22	112.39
Mobile (non-road)								
Truck	1	18.36	0.89	7.00	1.64	1.00	0.97	2342.98
Forklift	1	5.34	0.56	3.33	0.40	0.55	0.54	572.24
Crane	1	9.57	0.66	2.39	0.65	0.50	0.49	931.93
Total per 10 acres of activity	6	39.40	3.13	17.38	3.12	2.83	2.74	4464.51

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	CO_2 (lb/day)
Air Compressor	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77
Total per 10 acres of activity	1	3.57	0.37	1.57	0.25	0.31	0.30	359.77

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC. The NONROAD model contains emissions factors for total HC and for VOC. The factors used here are the VOC factors.

c) The NONROAD emission factors assume that the average fuel burned in nonroad trucks is 1100 ppm sulfur. Trucks that would be used for the Proposed Actions will all be fueled by highway grade diesel fuel which cannot exceed 500 ppm sulfur. These estimates therefore over-estimate SO2 emissions by more than a factor of two.

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	Project-Specific Emission Factors (lb/day)						
		NO_x	VOC	CO	SO_2**	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	2	83.282	5.154	31.420	1.666	5.091	4.938	9883.053
Paving Equipment	1	45.367	2.606	18.578	0.907	2.776	2.693	5623.957
Demolition Equipment	1	31.808	1.886	12.584	0.636	1.923	1.865	3703.074
Building Construction	1	39.396	3.130	17.382	3.116	2.829	2.744	4464.512
Air Compressor for Architectural Coating	1	3.574	0.373	1.565	0.251	0.309	0.300	359.773
Architectural Coating**			33.005					

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project.

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 acre)*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	915,000	21.01	6	(from "Grading" worksheet)
Paving:	230,000	5.28	26	
Demolition:	50,000	1.15	57	
Building Construction:	164,000	3.76	240	
Architectural Coating	164,000	3.76	20	(per SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Total Project Emissions by Activity (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Grading Equipment	499.69	30.92	188.52	9.99	30.55	29.63	59,298
Paving	1,179.55	67.75	483.04	23.59	72.18	70.01	146,223
Demolition	1,825.50	108.21	722.21	36.51	110.38	107.06	212,527
Building Construction	9,455.12	751.15	4,171.75	747.92	678.97	658.60	1,071,483
Architectural Coatings	71.48	667.56	31.31	5.02	6.19	6.00	7,195
Total Emissions (lbs):	**13,031.35**	**1,625.60**	**5,596.83**	**823.04**	**898.26**	**871.31**	**1,496,727**

Results: Total Project Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Total Project Emissions (lbs)	13,031.35	1,625.60	5,596.83	823.04	898.26	871.31	1,496,727
Total Project Emissions (tons)	6.52	0.81	2.80	0.41	0.45	0.44	748.36

Construction Fugitive Dust Emissions

Construction Fugitive Dust Emission Factors

	Emission Factor	Units	Source
Construction and Demolition Activities	0.19	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42	ton PM_{10}/acre-month	MRI 1996; EPA 2001; EPA 2006

$PM_{2.5}$ Emissions

$PM_{2.5}$ Multiplier	0.10	(10% of PM_{10} emissions assumed to be $PM_{2.5}$)	EPA 2001; EPA 2006
Control Efficiency	0.50	(assume 50% control efficiency for PM_{10} and $PM_{2.5}$ emissions)	EPA 2001; EPA 2006

Project Assumptions

New Roadway Construction (0.42 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	5.3	acres

General Construction Activities (0.19 ton PM_{10}/acre-month)

Duration of Construction Project	12	months
Area	15.7	acres

	Project Emissions (tons/year)			
	PM_{10} uncontrolled	**PM_{10} controlled**	**$PM_{2.5}$ uncontrolled**	**$PM_{2.5}$ controlled**
New Roadway Construction	26.61	13.31	2.66	1.33
General Construction Activities	35.85	17.93	3.59	1.79
Total	**62.47**	**31.23**	**6.25**	**3.12**

Construction Fugitive Dust Emission Factors

General Construction Activities Emission Factor

0.19 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM_{10}/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM_{10}/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions From Construction Operations, calculated the 0.19 ton PM_{10}/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM_{10}/acre-month) and 75% of the average emission factor (0.11 ton PM_{10}/acre-month). The 0.19 ton PM_{10}/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM_{10}/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particulate (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District as well as the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM_{10}/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM_{10}/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel resulting in emissions that are higher than other general construction projects. The 0.42 ton PM10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

$PM_{2.5}$ Multiplier **0.10**

$PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM_{10} and $PM_{2.5}$ **0.50**

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM_{10} and $PM_{2.5}$ in PM nonattainment areas (EPA 2006). Wetting controls will be applied during project construction.

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999.* EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants.* Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Grading Schedule

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 21.0 acres/yr (from Combustion Worksheet)
Qty Equipment: 7.0 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	21.01	2.63
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	21.01	10.27
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	10.50	10.59
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	10.50	4.34
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	21.01	7.37
TOTAL								35.20

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 35.20
Qty Equipment: 7.00
Grading days/yr: 5.03

Construction Commuter Emissions

Emissions from construction workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model (on-road) were used. These emission factors are available online at http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

Assumptions:
Passenger vehicle emission factors for scenario year 2010 are used

The average roundtrip commute for a construction worker =	40	miles
Number of construction days =	240	days
Number of construction workers (daily) =	25	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last updated April 24, 2008. Available online: <http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html>. Accessed 27 May 2009.
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC

Construction Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
lbs	**220.354**	**219.357**	**1983.062**	**2.586**	**20.875**	**13.148**	**262963.764**
tons	**0.110**	**0.110**	**0.992**	**0.0013**	**0.0104**	**0.0066**	**131.482**

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of construction days * number of workers

Metropolitan Denver Intrastate Air Quality Control Region

			Point Source Emissions						Area Source Emissions (Non-Point and Mobile Sources)					
Row #	State	County	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO	NOx	PM_{10}	$PM_{2.5}$	SO_2	VOC
1	CO	Adams Co	2,848	12,668	3,255	1,700	18,313	5,876	115,145	13,662	10,779	1,904	1,053	13,472
2	CO	Arapahoe Co	685	746	974	805	88.1	2,272	145,873	15,162	11,441	1,925	1,519	17,918
3	CO	Boulder Co	685	4,805	929	504	3,856	2,161	76,002	8,927	4,911	1,057	1,093	11,808
4	CO	Clear Creek Co	68.4	56.4	78.8	31	1.77	54.5	21,458	2,538	1,336	254	78.4	1,864
5	CO	Denver Co	1,119	6,393	705	439	5,345	3,308	171,708	21,177	7,651	1,726	2,088	23,340
6	CO	Douglas Co	132	75	127	64.2	43.6	651	69,408	8,569	5,090	935	568	7,537
7	CO	Gilpin Co	0	0	0	0	0	8.16	2,998	679	494	118	50.5	387
8	CO	Jefferson Co	1,158	2,742	629	361	2,783	3,058	154,920	17,174	5,509	1,524	1,364	19,913
Grand Total			6,695	27,485	6,698	3,904	30,430	17,389	757,512	87,888	47,211	9,443	7,814	96,239

SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2002)
Site visited on 25 February 2011

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Emissions Calculation Sheet
Diesel Fired Emergency Generators

EMISSION UNIT DESCRIPTION: 10 Diesel-Fired Emergency Generators equipped with Selective Catalytic Reduction pollution control

EQUIPMENT AND OPERATING DATA:

Maximum Engine Rating (Standby)	~	2500 KW	
	~	3353 HP	
Maximum Fuel Consumption	~	250.0 gal/hr	
Maximum Heat Input to the Emergency Generator Engine		34.25 mmBtu/hr	Calculated: Maximum Fuel Rate x Heating Value / 1,000,000
Maximum Hours of Operation for Testing and Maintenance		3700 hrs/yr	Proposed limit
Maximum Annual Diesel Fuel Consumption		925,000 gal/yr	Calculated: Max. hourly fuel rate x Max. Hours of Operation
Maximum Annual Heat Input		126,725 mmBtu/yr	Calculated: Max. hourly heat input x Max. Hours of Operation
Sulfur content in fuel		0.0015%	Only ultra low sulfur diesel (15 ppm) will be used
Heating Value of Diesel		137,000 Btu/gal	AP-42 (Appendix A), page A-5

BASIS OF EMISSIONS CALCULATION:

Emission Factors and References:

Pollutant	Emission Factor		Reference	Notes / Comments
SO2	0.001515	lb/mmBtu	AP-42	AP-42, 10/96, Tbl 3.4-1, page 3.4-5; assume 0.0015% sulfur
PM	0.70	lb/hr	CAT	Caterpillar C175-16 Engine data sheet - 100% load
PM10	0.70	lb/hr	CAT	Caterpillar C175-16 Engine data sheet - 100% load
NOx	56.72	lb/hr	CAT	Caterpillar C175-16 Engine data sheet - 100% load
CO	13.57	lb/hr	CAT	Caterpillar C175-16 Engine data sheet - 75% load
CO2	165	lb/mmBtu	AP-42	AP-42, 10/96, Tbl 3.4-1, page 3.4-5
NMOC	2.67	lb/hr	CAT	Caterpillar C175-16 Engine data sheet - 10% load

Emissions factors are "Not to Exceed" data from Caterpillar engine performance data sheets no. DM8449, except for SO2. The selected factors are the highest ones for each pollutant across the range for 4 operating loads provided by the vendor.
SO2 emissions are a function of the sulfur content of the fuel fired, per USEPA AP-42.

Pollution Control Efficiencies

Pollutant	Reduction %	Reference	Notes / Comments
SO2	0.0%	NA	No removal of SO2
PM	15.0%	E-POD	CleanAir Systems - Max. removal minus 5%
PM10	15.0%	E-POD	CleanAir Systems - Max. removal minus 5%
NOx	90.0%	E-POD	CleanAir Systems - Max. removal minus 5%
CO	90.0%	E-POD	CleanAir Systems - Max. removal minus 5%
CO2	0.0%	NA	No removal of CO2
NMOC	90.0%	E-POD	CleanAir Systems - Max. removal minus 5%

CleanAir Systems claims control efficiencies up to 95% for NOx; over 20% for PM; up to 95% for hydrocarbons (HC) and up to 95% for CO for their E-POD™ control system (includes SCR and DOC).
We have subtracted 5% efficiency from the maximum efficiencies stated by the vendor, for conservatism.

POTENTIAL EMISSIONS - Per Generator:

Maximum Hourly Emissions (w/o SCR control installed)

Pollutant	Emission Factor		x	Maximum Hourly Production Level		x	(1 - Control Efficiency)	=	Proposed Maximum Hourly Emissions (lb/hr)
SO2	0.001515	lb/mmBtu		34.25	mmBtu/hr		1.00		0.052
PM	0.7	lb/hr		1	hr		1.00		0.70
PM10	0.7	lb/hr		1	hr		1.00		0.70
NOx	56.72	lb/hr		1	hr		1.00		56.72
CO	13.57	lb/hr		1	hr		1.00		13.57
CO2	165	lb/mmBtu		34.25	mmBtu/hr		1.00		5651.25
NMOCs	2.67	lb/hr		1	hr		1.00		2.67

Note: The above emission rates are assumed to apply during the first 30 minutes of operation before the catalytic control has reached the temperature for optimum effectiveness.

Maximum Hourly Emissions (w/ SCR control installed)

Pollutant	Emission Factor		x	Maximum Hourly Production Level		x	(1 - Control Efficiency)	=	Proposed Maximum Hourly Emissions (lb/hr)
SO2	0.0015	lb/mmBtu		34.25	mmBtu/hr		1.00		0.052
PM	0.7	lb/hr		1	hr		0.85		0.60
PM10	0.7	lb/hr		1	hr		0.85		0.60
NOx	56.72	lb/hr		1	hr		0.10		5.67
CO	13.57	lb/hr		1	hr		0.10		1.36
CO2	165	lb/mmBtu		34.25	mmBtu/hr		1.00		5651.25
NMOCs	2.67	lb/hr		1	hr		0.10		0.27

Maximum Annual Emissions (w/o SCR control installed) **T&M Operational Limit: 3700 hr/yr**

Pollutant	Emission Factor		x	Maximum Annual Production Level		x	Potential Annual Emissions (lb/year)		Conversion to tons	=	Potential Annual Emissions (tons/year)
SO2	0.0015	lb/mmBtu		126,725.00	mmBtu/yr		191.99	lb	0.0005		18.4298
PM	0.70	lb/hr		3,700	hr/yr		2,590.00	lb	0.0005		1.295
PM10	0.70	lb/hr		3,700	hr/yr		2,590.00	lb	0.0005		1.295
NOx	56.72	lb/hr		3,700	hr/yr		209,864.00	lb	0.0005		104.93
CO	13.57	lb/hr		3,700	hr/yr		50,209.00	lb	0.0005		25.10
CO2	165.00	lb/mmBtu		126,725.00	mmBtu/yr		20,909,625.00	lb	0.0005		10454.81
NMOCs	2.67	lb/hr		3,700	hr/yr		9,879.00	lb	0.0005		4.94

Maximum Annual Emissions (w/ SCR control installed) **T&M Operational Limit: 3700 hr/yr**

Pollutant	Emission Factor		x	Maximum Annual Production Level		x	Potential Annual Emissions (lb/year)		Conversion to tons	=	Potential Annual Emissions (tons/year)
SO2	0.0015	lb/mmBtu		126,725.00	mmBtu/yr		191.99	lb	0.0005		0.096
PM - uncontrolled	0.70	lb/hr		462.5	hrs/yr		323.75	lb			
PM - controlled	0.60	lb/hr		3,237.5	hrs/yr		1,926.31	lb			
PM - TOTAL							2,250.06	lb	0.0005		1.125
PM10 - uncontrolled	0.70	lb/hr		462.5	hrs/yr		323.75	lb			
PM10 - controlled	0.60	lb/hr		3,237.5	hrs/yr		1,926.31	lb			
PM10 - TOTAL							2,250.06	lb	0.0005		1.125
NOx - uncontrolled	56.72	lb/hr		462.5	hrs/yr		26,233.00	lb			
NOx - controlled	5.67	lb/hr		3,237.5	hrs/yr		18,363.10	lb			
NOx - TOTAL							44,596.10	lb	0.0005		22.298
CO - uncontrolled	13.57	lb/hr		462.5	hrs/yr		6,276.13	lb			
CO - controlled	1.36	lb/hr		3,237.5	hrs/yr		4,393.29	lb			
CO - TOTAL							10,669.41	lb	0.0005		5.335
CO2	165.00	lb/mmBtu		126,725	mmBtu/yr		20,909,625.00	lb	0.0005		10,454.813
NMOCs - uncontrolled	2.67	lb/hr		462.5	hrs/yr		1,234.88	lb			
NMOCs - controlled	0.27	lb/hr		3,237.5	hrs/yr		864.41	lb			
NMOCs - TOTAL							2,099.29	lb	0.0005		1.050

Notes:

Effectiveness of Pollution Control Device		Basis
Annual hours of operation uncontrolled:	462.5 hours	12.5% of all operations. First 30 minutes of operation for maintenance and testing.
Annual hours of operation controlled:	3237.5 hours	Remaining hours of operation for maintenance and testing
	3700 hours	Total hours of operation

Calculates Emissions from the Operation of Natural Gas-Fired Boilers

Assumes total consumption of 11 million cubic feet of natural gas per year, as calculated in Infrastructure Section

Pollutant	Emission Factor	Units	Potential Annual Emissions (lb/yr)	Conversion to Tons	Potential Annual Emissions (tons/yr)	MDI AQCR Emissions (tons/yr)	Percent of Regional
SO2	0.6	lb/mmft3	6.6	0.0005	0.003	38,244	0.000%
PM	7.6	lb/mmft3	83.6	0.0005	0.042	53,909	0.000%
NOx	280	lb/mmft3	3080	0.0005	1.540	115,373	0.001%
CO	84	lb/mmft3	924	0.0005	0.462	764,207	0.000%
CO2	120,000	lb/mmft3	1320000	0.0005	660.000	97,500,000	0.001%
VOC	5.5	lb/mmft3	60.5	0.0005	0.030	113,628	0.000%

Source: USEPA 1998. AP-42. *Emission Factors for Natural Gas Combustion.* Table 1.4-1 and Table 1.4-2. Pages 1.4-5 and 1.4-6.

Assumption: Uncontrolled (Pre-NSPS) for NOx

Commuter Emissions

Emissions from workers commuting to the job site are estimated in this spreadsheet.

Emission Estimation Method: Emission factors from the South Coast Air Quality Management District (SCAQMD) EMFAC 2007 (v 2.3) Model

Assumptions:

The average roundtrip commute for a worker =	40	miles
Number of working days =	240	days
Number of new workers (daily) =	100	people

Passenger Vehicle Emission Factors for Year 2010 (lbs/mile)

NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
0.00091814	0.00091399	0.00826276	0.00001077	0.00008698	0.00005478	1.09568235

Source: South Coast Air Quality Management District. EMFAC 2007 (ver 2.3) On-Road Emissions Factors. Last
Notes:
The SMAQMD 2007 reference lists emission factors for reactive organic gas (ROG). For purposes of this worksheet ROG = VOC

Commuter Emissions

	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2	
lbs	881.415	877.429	7932.247	10.344	83.500	52.590	1051855.054	
tons	0.441	0.439	3.966	0.005	0.042	0.026	525.928	
MDI AQCR Emissions (tons)	115,373	113,628	764,207	38,244	53,909	13,347	97,500,000	*CO2 in Metric Tons*
Percent of Regional	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%	0.000%	

Example Calculation: NO_x emissions (lbs) = 60 miles/day * NO_x emission factor (lb/mile) * number of work days * number of workers