

**ENVIRONMENTAL ASSESSMENT
OF
2005 BASE CLOSURE AND REALIGNMENT ACTIONS AT
BUCKLEY AIR FORCE BASE, COLORADO**



**460 CES/CEV
660 S. ASPEN STREET
BUCKLEY AFB, CO 80011-9551**

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This EA evaluates the Proposed Action to implement the 2005 BRAC Commission's recommendations for Buckley AFB. The Proposed Action would involve the construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft from Springfield-Beckley Municipal Airport Air Guard Station, Ohio, to the 140 WG, Buckley AFB, Colorado. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The 460 SW is the current host unit at Buckley AFB and the 140 WG of the Colorado Air National Guard (COANG) operates as a tenant. Under the No Action Alternative, Buckley AFB would not implement the recommendations, resulting in no change to the existing conditions as a result of not implementing the action at the base. This EA analyzes and documents potential environmental consequences associated with the Proposed Action and reasonable alternatives to the Proposed Action at Buckley AFB. If the analyses presented in this EA indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, a Finding of No Significant Impact (FONSI) would be prepared. In addition this Proposed Action has the potential to impact wetlands. If there is no practicable alternative to impacting wetlands then a Finding of No Practicable Alternative (FONPA) will be issued. If significant environmental issues are identified that cannot be minimized to insignificant levels, an Environmental Impact Statement (EIS) would be prepared or the Proposed Action would be abandoned and no action would be taken. This EA is to be made available to government agencies and the public upon completion. The Draft EA and Draft Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) were made available to the public for a review period, beginning 17 April 2008, and concluding 19 May 2008. Copies of the Draft EA and Draft FONSI/FONPA were available for review at the following libraries: Aurora Central Library; Denver Public Library, and the Boulder Public Library. Written comments and inquiries regarding this document were directed to Ms. Elizabeth Meyer, NEPA Compliance Program Manager, 460th Civil Engineer Squadron Environmental Flight (460 CES/CEV) 660 South Aspen Street, Mail Stop 86, Buckley AFB, CO 80011-9551. Comments were received from the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (see Appendix B).

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**FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE
ENVIRONMENTAL ASSESSMENT OF 2005 BASE CLOSURE AND REALIGNMENT ACTIONS
AT BUCKLEY AFB, COLORADO**

Agency: U.S. Air Force (USAF), 460th Space Wing (460 SW)

Introduction: Buckley Air Force Base (AFB) proposes to implement the recommendations from the Defense Base Closure and Realignment Commission (2005 BRAC Commission) and construct infrastructure upgrades in support of the recommendations. The Proposed Action and the No Action Alternative were assessed in an Environmental Assessment (EA), which is incorporated by reference in this Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA).

On 8 September 2005, the 2005 BRAC Commission issued recommendations that included specific actions for Buckley AFB affecting the 460 SW. The Commission's recommendations must now be implemented as provided for in the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510), as amended.

Purpose of and Need for the Proposed Action: The purpose of the Proposed Action is to implement the 2005 BRAC Commission's recommendations pertaining to Buckley AFB. The need for the Proposed Action is to comply with the Base Closure and Realignment Act of 1990 and to improve the ability of the nation to respond rapidly to the geopolitical challenges of the 21st century. The 2005 BRAC Commission's recommendations support advancing the goals of transformation, improving military capabilities, and enhancing military value. The USAF needs to carry out the 2005 BRAC Commission's recommendations at Buckley AFB to achieve the objectives for which Congress established the BRAC process and to comply with the law.

Description of the Proposed Action: Buckley AFB will construct the facilities and associated infrastructure, construct and improve roads, and upgrade utilities necessary to accommodate the 2005 BRAC Commission's recommendations. The purpose of the EA is to analyze the impacts on environmental and socioeconomic resources resulting from the Proposed Action to construct new facilities and associated infrastructure, upgrade the Mississippi Gate, construct a new West Gate, add approximately 800 personnel to the base, and accommodate the addition of three back-up F-16 aircraft. Of the 800 personnel, 350 would be from the 926th Fighter Wing and 450 would be relocated from the Air Reserve Personnel Center Buckley Annex.

Under the Proposed Action, new facilities would be strategically constructed in areas of similar land use categories, close to the required resources of the base, with infrastructure improvements to connect to the required utilities, and would be easily accessible from existing roads. In order to better accommodate existing and future traffic at Buckley AFB, Aspen Way would be realigned with Beaver Creek and Aspen Street. Implementation of the Proposed Action would include seven facility construction projects, as listed below:

- ***Project No. 1 - Construct 310 MSG Consolidated Training and Storage Facility.*** This proposed project would provide a new two-story, 15,887-square-foot (ft²) facility east of Aspen Street and north of Camp Hale Way. This project would be scheduled for construction in Fiscal Year (FY) 2009. There is no associated parking being built with this project.
- ***Project No. 2 - Construct 310 MSG Communications Squadron Training Building.*** This proposed project would provide a new two-story, 3,434-ft² facility between Aspen Street and Vail Street and directly adjacent to Building 730. This project would be scheduled for construction in

FY 2009. In order to accommodate personnel for this facility, approximately 21,000 ft² of new parking would be needed.

- **Project No. 3 - Construct 310 MSG Medical Squadron Facility.** This proposed project would provide a new two-story, 10,882-ft² facility between Beaver Creek and Aspen Street. This project would be scheduled for construction in FY 2009. There is no associated parking being built with this facility, as there is currently sufficient existing parking to accommodate new personnel.
- **Project No. 4 - Construct 310 MSG Civil Engineer Squadron Facility.** This proposed project would provide a new two-story, 11,960-ft² facility to support the Civil Engineer Squadron. The location of this building would be between Camp Hale Way and Aspen Street. This project would be scheduled for construction in FY 2009. There is no associated parking being built with this facility, as there is currently sufficient existing parking to accommodate new personnel.
- **Project No. 5 - Construct 310 MSG Security Forces Squadron Facility.** This proposed project would provide a new two-story, 9,375-ft² facility to provide a Security Forces Squadron Training Facility. This project would be scheduled for construction in FY 2008. In order to accommodate personnel for this facility, approximately 21,000 ft² of new parking would be needed.
- **Project No. 6 - Construct Air Reserve Personnel Center Administrative Facility.** This proposed project would provide a new two-story, 133,534-ft² administrative facility. This project would be scheduled for construction in FY 2009. In order to accommodate this facility, a two-story parking garage with approximately 135,000 ft² of new parking would be needed.
- **Project No. 7 - Construct 310 MSG Headquarters Facility.** The proposed 26,400-ft² Headquarters Facility would be just west of the ARPC facility. This project would be scheduled for construction in FY 2009. In order to accommodate this facility, approximately 27,000 ft² of new parking would be needed.
- **Project No. 8 - Upgrade Mississippi Gate and Construct a New West Gate.** Under this proposed project, the south Mississippi Gate would be upgraded to include an additional entrance lane and covered inspection area. The Mississippi Gate upgrade would be scheduled for FY 2008. On the western boundary of Buckley AFB, a new West Gate would be added. The West Gate would require approximately 3,000 ft² of building space. New roads for entrance and exit from the base would also be required. This West Gate would be scheduled for construction in FY 2014 or later.
- **Project No. 9 - Expand Aspen Way and Improve Infrastructure, Roads, and Utilities.** Expansion and extension of Aspen Way is proposed to join Beaver Creek and Aspen Street to accommodate increased traffic. Expanded bridge work would be required to avoid wetlands and a new drainage pipe would be installed. This project would be scheduled for construction in FY 2008.

Summary of Anticipated Environmental Impacts Associated with the Alternatives

No Action Alternative: Under the No Action Alternative, no new gate would be constructed, and no improvements would be made to the Mississippi Gate. Therefore, existing waits or backups at the gates would continue, which would be considered a negligible continuing adverse impact. No facility construction or additional personnel would be assigned to Buckley AFB.

Proposed Action: Based on the analyses accomplished as a part of the preparation of the EA, it was determined that the proposed action would not result in any significant adverse effects on the environmental and socioeconomic resources. Long-term minor adverse effects on traffic and transportation are expected as a result of the increase in personnel. Short-term minor adverse effects on air quality and negligible adverse effects on the noise environment are expected as a result of construction activities. Minor short-term adverse effects associated with construction activities would be localized to the immediate area of construction and would subside following the end of construction in that area. The

generation of construction waste would be an unavoidable adverse impact but would be insignificant in scale relative to basewide generation.

Notice of Wetland Involvement: As guided by Executive Order 11990, *Protection of Wetlands* and Air Force Instruction 32-7064, *Integrated Natural Resources Management*, the USAF hereby provides notice of the potential for wetland impacts. A wetland just south of Beaver Creek Street and west of Aspen Way has the potential to be adversely impacted under the Proposed Action by Project Nos. 6, 7, and 9. The expansion of Aspen Way under Project No. 9 crosses the drainage feeding this wetland and could infringe upon the wetland itself. Projects Nos. 6 and 7 are in a sensitive drainage area and are approximately 200 feet away from the affected wetland. Potential impacts on this wetland could be from indirect disturbance or reconstruction of the bridge and increasing the size during replacement of the existing drainage pipe.

The USAF has a no net loss policy on wetlands, and considers this area to be a wetland; although, it is not jurisdictional for the purpose of permitting under Section 404 of the Clean Water Act. The USAF will mitigate the loss of the small wetland area through either creation of a similar feature nearby, or enhancing the existing wetlands. Overall, there would be no net impact to wetlands at the installation level.

Other alternatives were reviewed during the EA development process under the requirements of the National Environmental Policy Act (NEPA), but were dismissed from detailed analysis because they either did not meet the stated selection criteria, or would have led to greater overall environmental impact. The only practicable alternative (*see* "Description of the Proposed Action," above) would involve siting in a wetland. For the reasons stated below, the dismissed alternatives are not practicable alternatives to avoiding the potential wetland impacts.

Alternative B – Utilization of Existing Facilities and Combination of Similar Activities: Under this alternative, the new personnel and functions moving to Buckley AFB would share existing facilities with the 460 SW. The existing clinic at Buckley AFB is presently fully occupied and meeting the requirements of the existing military population associated with the 460 SW. The existing facility housing the 460 CES is also presently occupied to the maximum capacity of the facility. There are extremely limited facilities available on the base for existing functions, much less than what is needed to accommodate the 2005 BRAC Commission actions. This alternative for combining some similar functions in existing facilities does not meet the selection criteria and was therefore not further evaluated in detail.

Alternative C – Southwestern Site: Under this alternative, a campus of several facilities would be constructed on the southwestern portion of the base. The area is hilly, contains heavy brush and shrubs, and wetlands. These existing environmental conditions would require extensive grading and filling to allow for construction of a large campus, resulting in substantial effects on wetlands and natural resources. In addition, this area is identified as containing unexploded ordnance (UXO) and land use is designated as a natural area. Constructing this campus in the southwestern portion of the base would isolate the personnel from close access to daily required resources. This would result in numerous vehicular trips by hundreds of personnel on a daily basis, thus increasing the amount of daily vehicle traffic and associated air pollutants in a county that is already in nonattainment status under the Clean Air Act (CAA). It is estimated that the cost to the government to tie into these utilities would exceed \$2 million. The existing road structures in the southwestern corner of the base are insufficient to support this alternative, and adequate upgrades of the roads would require substantial effects on wetlands along the existing route. This would result in additional costs not required if the facilities were constructed in the developed area of the base. Although the project for upgrading the Mississippi Gate is in this same area, the cost of remediation and time for the road work required would be far less than the cost and time to remediate the required acres in preparation of the southwestern site for building the campus. Because of

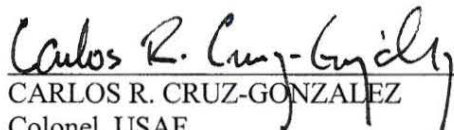
the high potential costs for remediation, potential adverse environmental impacts, and wetland impacts this alternative does not meet the selection criteria and is therefore not further evaluated in detail.

Alternative D – Combined Use of Two Areas in Northwest: Under this alternative, the new required facilities would be built in two separate areas in close proximity in the northwestern portion of the base: (a) the areas north of Steamboat Avenue and east of Telluride Street, and (b) south of Steamboat Avenue and west of Telluride Street. A portion of the site south of Steamboat Avenue and west of Telluride Street would conflict with the proposed West Gate. Additionally, the Base General Plan indicates this area is already in the planning stage for the construction of new dormitories and recreational fields. Remediation costs for Alternative D would also increase due to an existing Military Munitions Response Program (MMRP) site between Telluride Street and the base perimeter in the area proposed for Alternative D. The cost and time involved for remediation of these areas to accommodate the 2005 BRAC Commission required timeline would be cost prohibitive because extensive excavation would be involved to remediate the proposed sites. Although this alternative has the potential for less environmental and wetland impact than the preferred alternative, it does not meet the selection criteria and was therefore not further evaluated in detail.

Therefore, based on the evaluation of other siting alternatives, there is no practicable alternative to the Proposed Action as other alternatives considered would lead to greater environmental impacts, including greater wetland impacts or do not meet the selection criteria, outweighing the merits of avoiding the small wetland under Alternative A (the Preferred Alternative).

Public Review and Interagency Coordination: The Draft EA and Draft FONSI/FONPA were made available to the public for a review period, beginning 17 April 2008 and concluding 19 May 2008. Based on the provisions set forth in the Proposed Action, all activities were found to comply with criteria or standards of environmental quality and coordinated with Federal, state, and local agencies. The Draft EA and Draft FONSI/FONPA were made available to Federal, state, and local agencies. Copies of the Draft EA and Draft FONSI/FONPA were also available for review at the following libraries: Aurora Central Library; Denver Public Library, and the Boulder Public Library. Comments were received from the Colorado Historical Society Office of Archaeology and Historic Preservation and the Air Pollution Control Division of the Colorado Department of Public Health and Environment (see Appendix B). Response to comments were made by letter to the originator and incorporated into the EA and FONSI/FONPA as appropriate.

Finding of No Significant Impact/Finding of No Practicable Alternatives: I conclude that the environmental effects of BRAC actions at Buckley AFB are not significant, preparation of an Environmental Impact Statement is unnecessary, and a FONSI/FONPA is appropriate. Pursuant to Executive Order 11990, *Protection of Wetlands* and Air Force Instruction 32-7064, *Integrated Natural Resources Management*, and the authority delegated by Secretary of the Air Force Order 791.1, and taking the above information into account, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize harm to the floodplain and wetland environments. The preparation of the EA is in accordance with NEPA, Council on Environmental Quality regulations, and 32 CFR Part 989, as amended.


CARLOS R. CRUZ-GONZALEZ
Colonel, USAF
Deputy Director of Installations

18 Aug 08
Date

COVER SHEET

ENVIRONMENTAL ASSESSMENT OF 2005 BASE CLOSURE AND REALIGNMENT ACTIONS AT BUCKLEY AIR FORCE BASE, COLORADO

Responsible Agencies: United States Air Force (USAF), National Guard Bureau (NGB), Headquarters Air Force Reserve Command (AFRC); Air Force Space Command (AFSPC), Air Force Center for Engineering and the Environment (AFCEE); 460th Space Wing (460 SW); 140th Wing (140 WG); and Buckley Air Force Base (AFB), Colorado.

Affected Location: Buckley AFB, Arapahoe County, Colorado.

Proposed Action: Implementation of approved 2005 Defense Base Closure and Realignment Commission (hereinafter referred to as “2005 BRAC Commission”) actions for Buckley AFB, to include the construction of new facilities at Buckley AFB, associated infrastructure improvements, a new West Gate, upgrades to the Mississippi Gate, a gain of approximately 800 personnel, and relocation of three back-up F-16 aircraft.

Report Designation: Environmental Assessment (EA).

Abstract: This EA evaluates the Proposed Action to implement the 2005 BRAC Commission’s recommendations for Buckley AFB. The Proposed Action would involve the construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft from Springfield-Beckley Municipal Airport Air Guard Station, Ohio, to the 140 WG, Buckley AFB, Colorado. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The 460 SW is the current host unit at Buckley AFB and the 140 WG of the Colorado Air National Guard (COANG) operates as a tenant. Under the No Action Alternative, Buckley AFB would not implement the recommendations, resulting in no change to the existing conditions as a result of not implementing the action at the base.

This EA analyzes and documents potential environmental consequences associated with the Proposed Action and reasonable alternatives to the Proposed Action at Buckley AFB. If the analyses presented in this EA indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, a Finding of No Significant Impact (FONSI) would be prepared. In addition, this Proposed Action has the potential to impact wetlands. If there is no practicable alternative to impacting wetlands then a Finding of No Practicable Alternative (FONPA) will be issued. If significant environmental issues are identified that cannot be minimized to insignificant levels, an Environmental Impact Statement (EIS) would be prepared or the Proposed Action would be abandoned and no action would be taken. This EA is to be made available to government agencies and the public upon completion.

The Draft EA and Draft Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) were made available to the public for a review period, beginning 17 April 2008, and concluding 19 May 2008. Copies of the Draft EA and Draft FONSI/FONPA were available for review at the following libraries: Aurora Central Library; Denver Public Library, and the Boulder Public Library. Written comments and inquiries regarding this document were directed to Ms. Elizabeth Meyer, NEPA Compliance Program Manager, 460th Civil Engineer Squadron Environmental Flight (460 CES/CEV), 660 South Aspen Street, Mail Stop 86, Buckley AFB, CO 80011-9551. Comments were received from the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (see **Appendix B**).

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AT BUCKLEY AIR FORCE BASE, COLORADO

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATION.....v

1. PURPOSE OF AND NEED FOR THE PROPOSED ACTION1-1

1.1 PROPOSED ACTION1-1

1.2 NEED FOR THE PROPOSED ACTION1-1

1.3 PURPOSE OF THE PROPOSED ACTION1-3

1.4 RELEVANT PLANS, LAWS, REGULATIONS, AND OTHER DOCUMENTS1-4

1.4.1 National Environmental Policy Act.....1-4

1.4.2 Integration of Other Environmental Statutes and Regulations.....1-5

1.4.3 Environmental and Other Documentation1-5

1.5 DECISION TO BE MADE1-5

1.6 SCOPE OF THE ENVIRONMENTAL ASSESSMENT.....1-5

1.6.1 History of the Planning and Scoping Process1-5

1.6.2 Resource Topics Studies in Detail1-6

1.6.3 Resource Topics Eliminated from Detailed Study1-6

1.7 APPLICABLE PERMITS, LICENSES, AND OTHER CONSULTATION REQUIREMENTS.....1-8

1.7.1 Permits1-8

1.7.2 Coordination Requirements.....1-8

1.8 ORGANIZATION OF THE EA.....1-8

2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION.....2-1

2.1 INTRODUCTION.....2-1

2.2 DESCRIPTION OF ALTERNATIVES2-1

2.2.1 No Action Alternative.....2-1

2.2.2 Alternative A – The Proposed Action.....2-1

2.2.3 Alternative B – Utilization of Existing Facilities and Combination of Similar Activities2-6

2.2.4 Alternative C – Southwestern Site.....2-7

2.2.5 Alternative D – Combined Use of Two Areas in Northwest2-7

2.3 PROCESS USED TO DEVELOP ALTERNATIVES2-10

2.3.1 History and Development Process of Alternatives2-10

2.3.2 Alternatives Eliminated from Detailed Study2-10

2.4 SUMMARY COMPARISON OF THE ACTIVITIES, THE PREDICTED ACHIEVEMENT OF THE PROJECT OBJECTIVES AND THE PREDICTED ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES2-10

2.5 IDENTIFICATION OF THE PREFERRED ALTERNATIVE2-15

2.6 ACTIVITIES CONTRIBUTING TO CUMULATIVE IMPACTS.....2-15

2.6.1 Off-Base Activities2-16

2.6.2 On-Base Activities2-17

2.6.3 Proposed Consolidated Facility at the Aerospace Data Facility2-18

3. AFFECTED ENVIRONMENT.....3-1

3.1 NOISE.....3-1

3.2 LAND USE3-4

3.3 AIR QUALITY3-5

3.4 GEOLOGICAL RESOURCES.....3-7

TABLE OF CONTENTS (CONTINUED)

3.5	WATER RESOURCES	3-9
3.6	BIOLOGICAL RESOURCES.....	3-10
3.7	CULTURAL RESOURCES AND VIEWSHED.....	3-18
3.8	SOCIOECONOMIC RESOURCES.....	3-19
3.9	UTILITIES	3-20
3.10	TRANSPORTATION/TRAFFIC	3-22
3.11	HAZARDOUS MATERIALS AND WASTES.....	3-23
4.	ENVIRONMENTAL CONSEQUENCES.....	4-1
4.1	NOISE.....	4-1
4.1.1	No Action Alternative.....	4-1
4.1.2	Alternative A: Proposed Action.....	4-2
4.2	LAND USE.....	4-4
4.2.1	No Action Alternative.....	4-4
4.2.2	Alternative A: Proposed Action.....	4-5
4.3	AIR QUALITY	4-6
4.3.1	No Action Alternative.....	4-7
4.3.2	Alternative A: Proposed Action.....	4-7
4.4	GEOLOGICAL RESOURCES.....	4-10
4.4.1	No Action Alternative.....	4-10
4.4.2	Alternative A: Proposed Action.....	4-11
4.5	WATER RESOURCES	4-12
4.5.1	No Action Alternative.....	4-12
4.5.2	Alternative A: Proposed Action.....	4-12
4.6	BIOLOGICAL RESOURCES.....	4-13
4.6.1	No Action Alternative.....	4-14
4.6.2	Alternative A: Proposed Action.....	4-14
4.7	CULTURAL RESOURCES AND VIEWSHED.....	4-18
4.7.1	No Action Alternative.....	4-18
4.7.2	Alternative A: Proposed Action.....	4-19
4.8	SOCIOECONOMIC RESOURCES.....	4-19
4.8.1	No Action Alternative.....	4-20
4.8.2	Alternative A: Proposed Action.....	4-20
4.9	UTILITIES	4-21
4.9.1	No Action Alternative.....	4-21
4.9.2	Alternative A: Proposed Action.....	4-21
4.10	TRANSPORTATION/TRAFFIC	4-25
4.10.1	No Action Alternative.....	4-26
4.10.2	Alternative A: Proposed Action.....	4-26
4.11	HAZARDOUS MATERIALS AND WASTES.....	4-34
4.11.1	No Action Alternative.....	4-34
4.11.2	Alternative A: Proposed Action.....	4-34
4.12	UNAVOIDABLE ADVERSE IMPACTS.....	4-37
4.13	COMPATIBILITY OF THE PROPOSED ACTION AND ALTERNATIVES WITH THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS	4-37
4.14	RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY	4-37
4.15	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES.....	4-38

TABLE OF CONTENTS (CONTINUED)

5. LIST OF PREPARERS5-1
6. REFERENCES6-1
7. DISTRIBUTION LIST AND AGENCIES AND INDIVIDUALS CONTACTED.....7-1

APPENDICES

- A. Applicable Laws, Regulations, Policies, and Planning Criteria
- B. Notice of Availability and Affidavit of Publication Interagency and Intergovernmental Coordination for Environmental Planning Materials
- C. Recent, Current, and Planned Capital Improvement Projects at Buckley AFB
- D. Air Emissions Calculations
- E. Summary Tables for Cumulative Impacts Calculations
- F. USAF Form 813

FIGURES

1-1. Vicinity Map of Buckley AFB, Colorado 1-2

2-1. General Locations of the Alternatives Considered that Involve Candidate Construction Locations 2-2

2-2. Proposed Location for New Facilities and Project Areas Under the Proposed Action (Alternative A) 2-3

2-3. Proposed Location for a 310 MSG Campus at a Southwestern Site Under Alternative C 2-8

2-4. Proposed Locations of Facilities Under Alternative D 2-9

3-1. Proposed Action Locations in Relation to Noise Contours at Buckley AFB 3-3

3-2. Proposed Action Locations in Relation to Land Use at Buckley AFB 3-6

3-3. Proposed Action Locations in Relation to Soils at Buckley AFB 3-8

3-4. Proposed Action Locations in Relation to Surface Water Resources at Buckley AFB 3-11

3-5. Proposed Action Locations in Relation to Vegetation Types and Conservation Plantings at Buckley AFB 3-13

3-6. Proposed Action Locations in Relation to Potential Locations of Threatened and Endangered Species at Buckley AFB 3-17

3-7. Proposed Action Locations in Relation to ERP Sites at Buckley AFB 3-27

4-1. Proposed Gate and Roads at Buckley AFB 4-30

4-2. Cumulative Traffic Impacts 4-33

TABLES

2-1. Proposed Utility and Road Distances for Infrastructure Improvements 2-5

2-2. Current and Proposed Aircraft Activity for the 140 WG 2-6

2-3. Constraints of Alternative Locations 2-11

2-4. Comparison of Alternatives with Selection Criteria 2-11

2-5. Summary Comparison of Predicted Environmental Effects of the Alternatives 2-12

2-6. Recommended Best Management Practices 2-13

2-7. Mitigation Required by Alternative 2-15

3-1. Predicted Noise Levels of Construction Equipment 3-4

3-2. Buckley AFB CY 2006 Stationary Source Air Emissions Inventory and 2003 Mobile Source Emissions 3-7

3-3. Properties of Soil Types Found on Proposed Project Locations at Buckley AFB 3-9

3-4. Threatened and Endangered Species and Species of Special Concern 3-15

3-5. Population and Poverty Characteristics 3-20

4-1. Conformity *de minimis* Emissions Thresholds 4-7

4-2. Total Proposed Construction Emissions Estimates from the Proposed Action 4-8

4-3. Change in Commuter Emissions Estimates from the Proposed Action 4-9

4-4. Total Emissions Estimates (Busiest Year) from the Proposed Action Compared to *de minimis* Values and MDIAOCR Regional Emissions 4-10

4-5. Cumulative Long-Term Utilities Usage 4-25

4-6. New Proposed Personnel Vehicle Trip Generation 4-26

4-7. Approximate Proposed Action Daily Traffic Volume Impacts 4-27

4-8. Intersection Level of Service and Delay Impacts – Alternative A 4-28

4-9. Traffic Impacts of Future Buckley Projects 4-29

4-10. Daily Traffic Volume Cumulative Impacts – Alternative A 4-31

4-11. Intersection Level of Service and Delay Cumulative Impacts 4-32

ABBREVIATIONS AND ACRONYMS

µg/m³	Micrograms per cubic meter	CIP	Capital Improvement Project
140 WG	140th Wing	CO	Carbon monoxide
310 MSG	310th Mission Support Group	COANG	Colorado Air National Guard
460 CES/CEV	460th Civil Engineer Squadron Environmental Flight	CSE	Comprehensive Site Evaluation
460 SFS	460th Security Forces Squadron	CWA	Clean Water Act
460 SW	460th Space Wing	CY	Calendar year
926 FW	926th Fighter Wing	dB	Decibel
ACM	Asbestos-Containing Material	dba	A-weighted decibel
ADF	Aerospace Data Facility	DIA	Denver International Airport
ADP	Area Development Plan	DNL	Day-Night Average A-weighted Sound Level
AEI	Air Emissions Inventory	DOD	Department of Defense
AFB	Air Force Base	DRCOG	Denver Regional Council of Governments
AFCEE	Air Force Center for Engineering and the Environment	EA	Environmental Assessment
AFI	Air Force Instruction	EAC	Early Action Compacts
AFPD	Air Force Policy Directive	EIAP	Environmental Impact Analysis Process
AFRC	Air Force Reserve Command	EIS	Environmental Impact Statement
AFSPC	Air Force Space Command	EO	Executive Order
AICUZ	Air Installation Compatible Use Zone	EOD	Explosive ordnance disposal
ANG	Air National Guard	ERP	Environmental Restoration Program
ANGB	Air National Guard Base	ESA	Endangered Species Act
AOC	Area of Concern	ETL	Engineering Technical Letter
AQCR	Air Quality Control Region	FAA	Federal Aviation Administration
ARPC	Air Reserve Personnel Center	FEMA	Federal Emergency Management Agency
ARS	Air Reserve Station	FICON	The Federal Interagency Committee on Noise
AST	Aboveground storage tank	FONPA	Finding of No Practicable Alternative
BMP	Best Management Practice	FONSI	Finding of No Significant Impact
BRAC	Base Realignment and Closure	ft²	Square feet
BX	Base Exchange	FY	Fiscal Year
CAA	Clean Air Act	GIS	Geographic Information System
CAPCD	Colorado Air Pollution Control Division	HAZMAT	Hazardous material
CAS	Centralized accumulation site	HAZMART	Hazardous Materials Pharmacy
CDOW	Colorado Division of Wildlife	HUD	U.S. Department of Housing and Urban Development
CDPHE	Colorado Department of Public Health and Environment	HVAC	Heating, ventilation, and air conditioning
CEQ	Council on Environmental Quality	HWMP	Hazardous Waste Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	HQ	Headquarters
CES	Civil Engineer Squadron	IAP	Initial accumulation point
CF	Consolidated Facility	ICRMP	Integrated Cultural Resources Management Plan
CFR	Code of Federal Regulations		
CGP	Construction General Permit		

ICEP	Interagency and Intergovernmental Coordination for Environmental Planning	POV	Privately owned vehicle
JA	Judge Advocate	ppm	Parts per million
KWh	Kilowatt-hours	PSD	Prevention of Significant Deterioration
LBP	Lead-based paint	PVC	Polyvinyl chloride
LOS	Level of Service	RCRA	Resource Conservation and Recovery Act
LRT	Light Rail Transit	ROI	Region of Influence
MDIAQCR	Metropolitan Denver Intrastate Air Quality Control Region	ROW	Right-of-way
mi²	Square miles	RTD	Regional Transportation District
MILCON	Military Construction	SAP	Satellite accumulation point
MMRP	Military Munitions Response Program	SARA	Superfund Amendments and Reauthorization Act
MS4	Municipal Separate Storm Sewer System	SHPO	State Historic Preservation Office
MSA	Metropolitan Statistical Area	SIP	State Implementation Plan
MSDS	Material Safety Data Sheets	SO_x	Oxides of sulfur
MSGP	Multi-Sector General Permit	SPCC	Spill Prevention Control and Countermeasures
MSW	Municipal solid waste	SQG	Small quantity generator
NAAQS	National Ambient Air Quality Standards	SWMP	Storm Water Management Plan
NAS	Naval Air Station	SWPPP	Storm Water Pollution Prevention Plan
NEPA	National Environmental Policy Act	tpy	Tons per year
NGB	National Guard Bureau	U.S.C.	United States Code
NHPA	National Historic Preservation Act	USACE	U.S. Army Corps of Engineers
NMIM	National Mobile Inventory Model	USAF	U.S. Air Force
NOA	Notice of Availability	USDOT	U.S. Department of Transportation
NOI	Notice of Intent	USEPA	U.S. Environmental Protection Agency
NO_x	Oxides of Nitrogen	USFWS	U.S. Fish and Wildlife Service
NPDES	National Pollutant Discharge Elimination System	UST	Underground storage tank
NRCS	Natural Resources Conservation Service	UXO	Unexploded ordnance
NRHP	National Register of Historic Places	VOC	Volatile organic compound
O&M	Operations and maintenance	vpd	Vehicles per day
O₃	Ozone		
OSHA	Occupational Safety and Health Administration		
PAA	Primary Aircraft Authorization		
Pb	Lead		
PCB	Polychlorinated biphenyl		
PEM2	Palustrine Emergent Non-Persistent		
PM₁₀	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 lubricants		

1. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 Proposed Action

Buckley Air Force Base (AFB) and the U.S. Air Force (USAF) propose to construct the facilities and associated infrastructure, construct and improve roads, and upgrade utilities necessary to accommodate the recommendations of the 8 September 2005 Defense Base Closure and Realignment Commission (hereinafter referred to as “2005 BRAC Commission” or “the Commission”) affecting Buckley AFB, Colorado. The purpose of this Environmental Assessment (EA) is to analyze the potential impacts on environmental and socioeconomic resources resulting from the Proposed Action to construct new facilities and associated infrastructure, expand and realign Aspen Way with Beaver Creek and Aspen Street, upgrade the Mississippi Gate, construct a new West Gate, add approximately 800 personnel to the base, and accommodate the addition of three back-up F-16 aircraft for the 140th Fighter Wing (140 WG).

Buckley AFB is on the eastern edge of urbanized portions of the City of Aurora in Arapahoe County, Colorado (see **Figure 1-1**). Encompassing 39,991 acres (136 square miles), Aurora is the second largest city in the Denver metropolitan area and the third largest city in the state. Approximately 52 percent of the total acreage composing the City of Aurora is zoned residential. Land use south and southwest of the installation is predominantly residential. The remaining 48 percent of Aurora’s total acreage is composed of industrial land and open space. Land use to the north and northwest of the installation consists primarily of light industry, commercial businesses, and open space. The areas northeast, east, and southeast of the installation are primarily open space. The open space is used either as agricultural land or as part of the Plains Conservation Center (BAFB 2004). Areas to the west of the installation are mixed residential and commercial uses.

The 460th Space Wing (460 SW) is the host at Buckley AFB. The mission of the 460 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 13,100 active-duty, Reserve, National Guard, civilian, and contractor personnel are assigned to Buckley AFB. Buckley AFB currently supports more than 100,000 people throughout the Rocky Mountains Front Range Community. The installation contributes an estimated \$1.1 billion annually to the local economy (BAFB 2007a).

1.2 Need for the Proposed Action

Buckley AFB has a need to comply with the Congressional mandate associated with accomplishing the recommendations of the 2005 BRAC Commission. On 8 September 2005, the 2005 BRAC Commission issued recommendations that included specific actions for Buckley AFB. These recommendations were approved by the President on 15 September 2005, and forwarded to Congress. The Congress did not alter any of the Commission’s recommendations and on 9 November 2005, the recommendations became law. The Commission’s recommendations must now be implemented as provided for in the Act (Public Law 101-510), as amended.

The 2005 BRAC Commission recommendations include the following actions affecting Buckley AFB:

- Realign the Air Reserve Personnel Center (ARPC), Buckley Annex, Colorado, by relocating from the Buckley Annex (previously Lowry AFB) to Buckley AFB, Aurora, Colorado.
- Realign the 926th Fighter Wing (926 FW), Naval Air Station (NAS) New Orleans Air Reserve Station (ARS), Louisiana, by relocating Communications, Security Forces, Engineer Squadron, and Medical Squadron to Buckley AFB, Colorado. Upon realignment at Buckley AFB, this unit

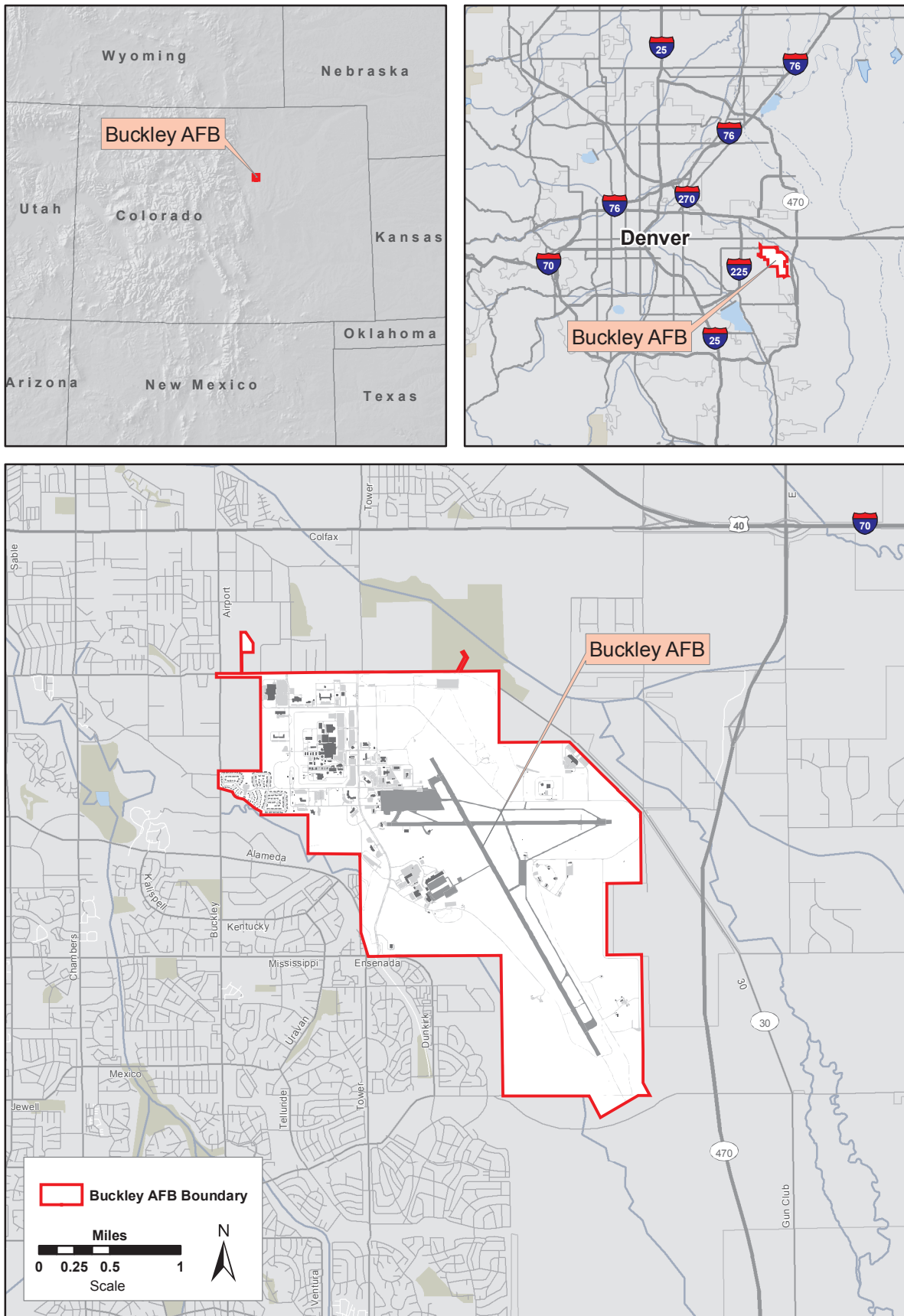


Figure 1-1. Vicinity Map for Buckley AFB, CO

would be renamed the 310th Mission Support Group (310 MSG); therefore, this unit will be referred to as the 310 MSG throughout the remainder of this document.

- Relocate three back-up F-16 aircraft from Springfield-Beckley Municipal Airport Air Guard Station, Ohio, to the 140 WG at Buckley AFB, Colorado. This action would increase the aircraft assigned to the 140 WG from 15 Primary Aircraft Authorization (PAA) to 18 PAA. The PAA denotes the number of aircraft authorized to a unit for performance of its operational mission. The mission of the 140 WG is to provide combat-ready personnel, aircraft, and equipment for worldwide deployment in support of USAF objectives. The unit's state mission is to protect life and property, provide disaster relief, and ensure public safety when called upon by the Governor of Colorado. The mission of the 140 WG to support the Colorado Air National Guard (COANG) would remain the same under the Proposed Action. Flight tracks and training profiles for the aircraft would also remain unchanged after realignment. These three F-16 aircraft would be used as alert backup aircraft and not result in an increase of flying hours for the 140 WG.

If approved, the Proposed Action would be implemented beginning approximately in fiscal years (FY) 2008 and 2009. This EA does not constitute approval to construct the Proposed Action. Any construction and demolition projects associated with the Proposed Action presented in this EA must be presented to the 460 SW Facility Board at Buckley AFB for review and approval, and project-specific siting.

1.3 Purpose of the Proposed Action

The purpose of the Proposed Action is to implement the 2005 BRAC Commission-approved actions pertaining to Buckley AFB. The Proposed Action includes the following:

- Construct a modern Consolidated Training and Storage facility that is adequately sized and functionally configured to support all training, storage, and administrative requirements of the 310 MSG Consolidated Training and Storage Facility. The planned size of this facility would be 15,887 square feet (ft²) and it would provide administrative/office space for 40 personnel working a normal 40-hour week.
- Construct a modern Communications Squadron training facility that is adequately sized and functionally configured to support all computer equipment needs, training, storage, and administrative requirements of the 310 MSG Communications Squadron. The planned size of this facility would be 3,434 ft² and it would support up to 60 people working a normal 40-hour week.
- Construct a modern 310 MSG Medical Squadron facility that is adequately sized and functionally configured to support all required medical equipment, training, storage, and administrative requirements of the 310 MSG Medical Group. The planned size of this facility would be 10,882 ft² and would support up to 50 people working a normal 40-hour week.
- Construct a modern Civil Engineer Squadron (CES) training facility that is adequately sized and functionally configured to support all training, storage, and administrative requirements of the 310 MSG CES. The planned size of this facility would be 11,960 ft² and would support up to 60 people working a normal 40-hour week.
- Construct a modern Security Forces Squadron training facility that is adequately sized and functionally configured to support all training, storage, and administrative requirements. The planned size of this facility would be 9,375 ft² and it would support up to 70 people working a normal 40-hour week.

- Construct a modern ARPC Administrative facility that is adequately sized and functionally configured to support all functions of the ARPC. The planned size of this facility would be 133,534 ft² and it would accommodate 450 ARPC personnel working a normal 40-hour week.
- Construct a modern 310 MSG Headquarters facility that is adequately sized and functionally configured to support all training, storage, and administrative requirements of the 310 MSG Headquarters. The planned size of this facility would be 26,400 ft² and it would support up to 70 people working a normal 40-hour week.
- Upgrade the Mississippi Gate to include an additional entrance lane and covered inspection area.
- Construct a new West Gate just west of the intersection of Telluride and Devil's Thumb Avenue. This West gate would have two lanes in and two lanes out for traffic flow, and a covered inspection area.
- Expand and realign Aspen Way with Beaver Creek and Aspen Streets. Upgrade infrastructure and utilities by extending gas and electric lines, potable water and sanitary sewer lines, storm sewer system, required communications, and roads to service the proposed facilities and the West Gate.
- Integrate three back-up F-16 aircraft into the 140 WG mission.

1.4 Relevant Plans, Laws, Regulations, and Other Documents

1.4.1 National Environmental Policy Act

The National Environmental Policy Act (commonly referred to as "NEPA") (42 United States Code [U.S.C.] Section 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before the decision is made and those actions are taken. NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis. This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. 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 of the 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 do the following:

- Briefly provide evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)
- Aid in an agency's compliance with NEPA when an EIS is unnecessary
- Facilitate preparation of an EIS when one is necessary.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementation for NEPA is 32 CFR Part 989, as amended (USAF 2003).

1.4.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for 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 a 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.”

1.4.3 Environmental and Other Documentation

Throughout this EA, existing approved environmental documents relevant to Buckley AFB will be used to describe the existing environmental conditions and effects. Such documents are appropriately cited and included in the reference section of the EA. Examples of these documents include the following:

- Buckley AFB General Plan (BAFB 2005a)
- Buckley AFB Draft Integrated Natural Resources Management Plan (BAFB 2004)
- Air Emissions Executive Summary Report (BAFB 2007b)
- Buckley AFB Economic Impact Statement (BAFB 2007a)
- EAs completed within the past 3 years, including the Capital Improvement Project (CIP) EA (BAFB 2006e).

1.5 Decision to be Made

Upon completion of this EA, Buckley AFB and Headquarters (HQ) AFRC will determine whether the Proposed Action would result in significant effects. If such effects are predicted, Buckley AFB would provide mitigation to reduce effects to below the level of significance, undertake an EIS, or abandon the Proposed Action. This EA will also be used to guide Buckley AFB in implementing the Proposed Action in a manner consistent with recommendations of the 2005 BRAC Commission and the USAF standards for environmental stewardship. This EA will identify where the Proposed Action will be located if built as approved by the 460 SW Facilities Board. The preferred alternative is Alternative A (the Proposed Action), as described in **Section 2.2.2**.

1.6 Scope of the Environmental Assessment

1.6.1 History of the Planning and Scoping Process

The scope of the EA includes an evaluation of alternatives for the various projects and analysis of the cumulative effects on the natural and man-made environments. The Proposed Action includes numerous projects, such as new facility construction, utilities upgrades, infrastructure upgrades, and road and gate improvements. Upon notification of the approved 2005 BRAC Commission actions, HQ AFRC and Buckley AFB began the planning process. This process included review of available land for facilities including alternative sites, the infrastructure required, and potential effects on the base.

The Intergovernmental Coordination Act and Executive Order (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, and thus AFRC and Buckley AFB, to implement a process

known as Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), which is used for the purpose of agency coordination and implements scoping requirements (i.e., to determine the scope of issues to be addressed in detail in the EA) (USAF 1994a). Through the IICEP process, the USAF notified relevant Federal, state, and local agencies of the Proposed Action and alternatives and provides them sufficient time to make known their environmental concerns specific to the action. An IICEP distribution list is included in **Section 7**.

NEPA requirements also 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 Federal proponents of an action provide information to state and local governments and the public and involve them in the planning process. CEQ guidance in 40 CFR 1501.7 specifically states, “There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to proposed actions. This process shall be termed scoping.” The public involvement process augments the USAF desire to cooperate with and consider state and local views in implementing a Federal proposal. For the action addressed in this EA, a Notice of Availability (NOA) for the Draft EA and Draft FONSI/FONPA was published in the *Aurora Sentinel*, *Denver Post*, and *Rocky Mountain News* on 17 April 2008, 20 April 2008, and 20 April 2008 respectively. In addition copies of the Draft EA and Draft FONSI/FONPA were available for review at the following libraries: Aurora Central Library; Denver Public Library, and the Boulder Public Library. (see **Appendix B**).

1.6.2 Resource Topics Studied in Detail

The EA examines potential effects of the Proposed Action and alternatives in 11 areas: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources and viewshed, socioeconomic resources, utilities, transportation/traffic, and hazardous materials and waste. These areas were identified as being potentially affected by the Proposed Action and include applicable critical elements of the human environment whose review is mandated by EO, regulation, or policy.

1.6.3 Resource Topics Eliminated from Detailed Study

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

Prime or Unique Farmlands

The Natural Resources Conservation Service (NRCS) has determined that there are no designated prime or unique farmlands on Buckley AFB (Backhaus 2001). Therefore, neither the Proposed Action nor the alternatives would impact prime or unique farmlands.

Lead-Based Paint, Radon, and Mold

Since there is no demolition of old buildings associated with the Proposed Action and the USAF policy is that no contractor shall introduce lead-based paint (LBP) in new construction projects, there would be no impact on this material and it dismissed from further analysis in this EA. In addition, the Proposed Action would have no impact on radon or mold. Design features for the new facilities would eliminate or at least minimize the opportunity for the buildup of radon gas.

Floodplains

There would be no adverse effects associated with floodplains at Buckley AFB as a result of implementing the Proposed Action. Based on the review of the Federal Emergency Management Agency (FEMA) data and the Buckley AFB Floodplain study, all proposed projects are outside of and would not impact the 100-year floodplain.

Airspace Management

Neither the Proposed Action nor any alternatives would involve any change in current flying missions at Buckley AFB or any other airspace. As no impacts on airspace are expected as a result of implementing the Proposed Action or alternatives, airspace was eliminated from detailed analysis in this EA.

Safety

Implementation of the Proposed Action or alternatives 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 (OSHA) 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 (MSDS). 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.

Environmental Justice

On February 11, 1994, President Clinton issued EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was created to ensure 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. Possible adverse effects from construction such as increased traffic, noise, and decreased air quality would be minimal and would affect the Region of Influence (ROI) and on-installation residents equally. Therefore, no disproportionate impacts on minority or low-income populations from the Proposed Action were identified. Off-base minority and low-income populations, limited in size and proximity to the base, would not be affected by the Proposed Action. Therefore, consideration of environmental justice impacts will not be studied in detail.

1.7 Applicable Permits, Licenses, and Other Consultation Requirements

1.7.1 Permits

Appendix A contains examples of relevant laws, regulations, and other requirements that are often considered part of the analysis. Only those laws, regulations, and other requirements that are relevant to the Proposed Action are included in **Appendix A**. In addition, various permits would be required for construction activities. The EA is not a substitute for those permit requirements. Air Force Form 103, *Base Civil Engineer Work Clearance Request*, is required prior to any earth disturbance project. Buckley AFB would not need a fugitive dust permit because the disturbed area of any of the projects under the Proposed Action does not exceed 25 acres.

Project areas would need to be surveyed for prairie dogs, burrowing owls, and other migratory birds, and, if present, relocation of these species would be required.

In accordance with the National Pollutant Discharge Elimination System (NPDES) requirements, a site-specific Storm Water Pollution Prevention Plan (SWPPP), including sediment- and erosion-control measures, would be developed and implemented for each specific construction site because each will be greater than one acre of ground disturbance. A Notice of Intent would be filed to obtain coverage under the U.S. Environmental Protection Agency (USEPA) Storm Water Construction General Permit. The proposed facilities would also need to conform to the Storm Water Management Plan (SWMP) for the Buckley AFB Municipal Separate Storm Sewer System (MS4) permit by implementing minimum control measures and best management practices (BMPs) as outlined in the SWMP.

It is USAF policy not to construct new facilities within areas containing wetlands where practicable. If the Proposed Action were approved, a FONSI/FONPA would be prepared and subsequently approved by the 460 SW demonstrating that the USAF has found no practicable alternatives to construction within the area that would affect the wetland.

1.7.2 Coordination Requirements

As part of the IICEP process (see **Section 1.6.1**), Buckley AFB will coordinate with and solicit a review of this EA from all Federal, state, and local agencies listed on the IICEP list presented in **Section 7**.

1.8 Organization of the EA

This EA is organized into the following sections:

Section 1 – Introduction: Purpose of and Need for the Proposed Action: provides background information about the base, the purpose of and need for the Proposed Action, the scope of the environmental review, applicable regulatory requirements, and a brief description of how the document is organized.

Section 2 – Description of the Proposed Action and Alternatives: provides the selection criteria; a detailed description of the Proposed Action, Action Alternatives, and the No Action Alternative; other alternatives that were considered but not carried forward in the evaluation process; and an overview comparison of the alternatives.

Section 3 – Affected Environment: provides a description of the existing baseline conditions of the resource areas potentially affected by the Proposed Action, Action Alternatives, and the No Action Alternative.

Section 4 – Environmental Consequences: provides an analysis of the direct and indirect effects of the proposed projects on resources from these alternatives. This section will provide a cumulative impacts analysis of present and reasonably foreseeable projects, and the potential incremental effects of the Proposed Action, Action Alternatives, and the No Action Alternative when considered along with these other planned or reasonably foreseeable projects.

Section 5 – List of Preparers: provides a list of the document preparers and contributors.

Section 6 – References: provides a listing of the references used in preparing the EA.

Section 7 – Distribution List and Agencies and Individuals Contacted: provides lists of agencies and individuals to whom this EA will be distributed and the agencies and individuals who were contacted for information in the preparation of this document.

Appendix A: contains examples of relevant laws, regulations, and other requirements that are often considered part of the analysis.

Appendix B: contains IICEP letters and responses, and affidavits of publication of the NOA.

Appendix C: contains recent, current, and planned Capital Improvement Projects (CIPs) at Buckley AFB.

Appendix D: contains air calculations to support the environmental impact analyses.

Appendix E: contains the cumulative impacts calculations tables from the Capital Improvement EA used in assessing the contributions of the Proposed Action to effects from other past, present, and reasonably foreseeable actions.

Appendix F: contains USAF Form 813, request for environmental impact analysis.

The EA will evaluate the Proposed Action (Alternative A) and the No Action Alternative. Resource areas that will be considered in the analysis are listed in **Section 1.6.2**. While the EA provides information with which to make informed decisions about proposed actions, it does not imply project approval or authorization, which will be accomplished through the 460 SW Facilities Board.

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2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section provides detailed information on the alternatives, including the Proposed Action, which are considered in the preparation this EA.

2.1 Introduction

Under NEPA, reasonable alternatives to the Proposed Action must be considered as part of the decision-making process. Considering alternatives helps to avoid unnecessary effects and allows analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be “ripe” for decisionmaking (i.e., any necessary preceding events having taken place), affordable, capable of implementation, and satisfactory with respect to meeting the purpose of and the need for the action. The following discussion identifies alternatives considered by the USAF and identifies whether they are reasonable and, hence, subject to detailed evaluation in the EA.

2.2 Description of Alternatives

The following subsections describe the No Action Alternative, the Proposed Action, and alternatives to the Proposed Action that were considered during the development of this EA. Screening criteria used to evaluate each of the alternatives considered are presented in **Section 2.3**. The locations of the Proposed Action and construction alternatives are depicted in **Figure 2-1**.

2.2.1 No Action Alternative

Under the No Action Alternative, Buckley AFB and HQ Air Force Reserve Command (AFRC) would not implement the Proposed Action. No new facilities would be constructed and the base would continue to operate with the current inventory of F-16 aircraft, maintain the workforce at present levels, and continue its daily operations as they presently exist. The No Action Alternative is not feasible because under this alternative the USAF would not comply with the 2005 BRAC Commission recommendations. However, CEQ regulations require the analysis of the No Action Alternative. The No Action Alternative serves as a baseline against which the effects of the Proposed Action and other potential action alternatives can be evaluated. The No Action Alternative will be further evaluated in the EA.

2.2.2 Alternative A – The Proposed Action

Under the Proposed Action, new facilities would be strategically constructed in areas of similar land use categories, close to the required resources of the base, with infrastructure improvements to easily connect to the required utilities, and would be easily accessible with existing roads. The Proposed Action would also include upgrades to the Mississippi Gate and construction of a new West Gate. These two gate activities are required to accommodate the increase in traffic resulting from the Proposed Action and future increases in traffic planned for Buckley AFB. The proposed locations of all new facilities and gate upgrades/construction under this alternative are depicted in **Figure 2-2**. The three realigned back-up F-16 aircraft would be assigned to the 140 WG and would require no new facilities, no additional aircraft apron space, and no additional maintenance facilities. The additional three F-16 aircraft would be used as backup aircraft. The flying hours of the 140 WG would not increase. This alternative meets all screening criteria for the site (see **Section 2.3**) and will be developed further and analyzed in detail in this EA.

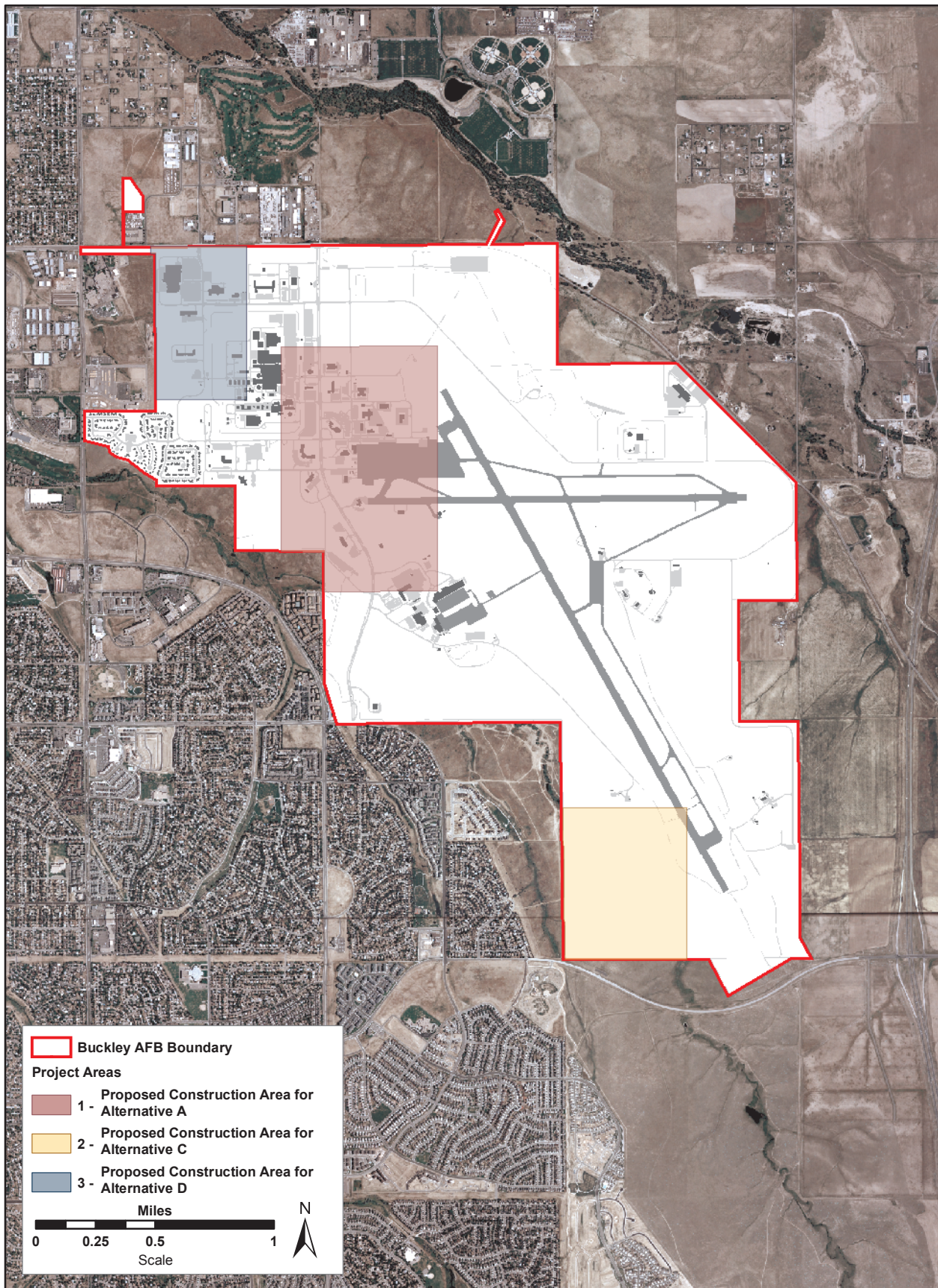
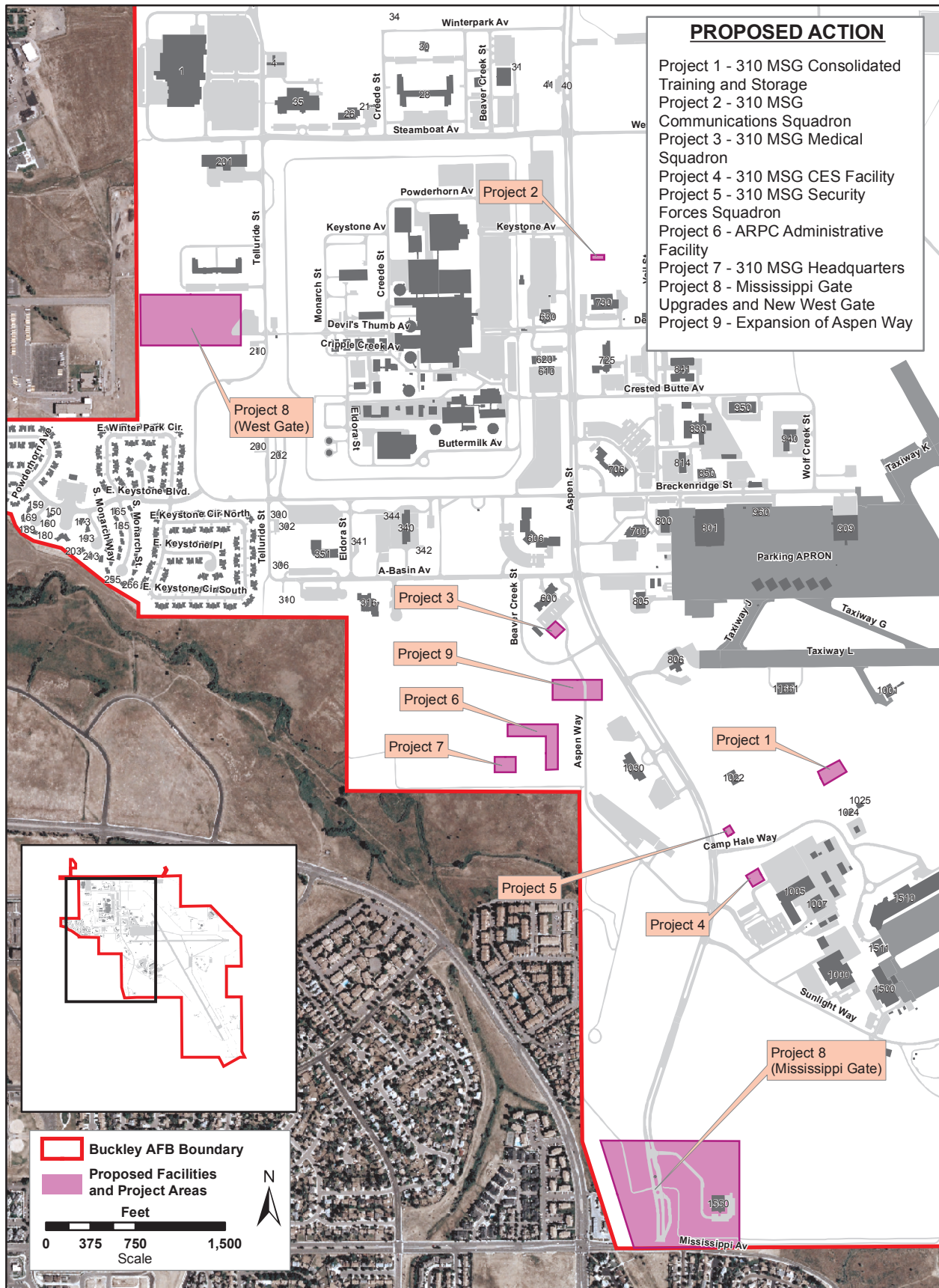


Figure 2-1. General Locations of the Alternatives Considered that Involve Candidate Construction Locations



Source of Proposed Facilities: e2M, Inc. 2006

Figure 2-2. Proposed Locations of New Facilities and Project Areas Under the Proposed Action (Alternative A)

2.2.2.1 Proposed Construction Projects

Implementation of the Proposed Action would include construction projects collectively representing 409,472 ft² of new building space and parking to support mission requirements. These projects are listed as follows:

- **Project No. 1. Construct 310 MSG Consolidated Training and Storage Facility North of Buildings 1024 and 1025.** This proposed project would provide a new two-story, 15,887-ft² facility east of Aspen Street and north of Camp Hale Way. This project would be scheduled for construction in Fiscal Year (FY) 2009. There is no associated parking being built with this facility as there is currently enough existing parking to accommodate new personnel.
- **Project No. 2. Construct 310 MSG Communications Squadron Training Building Adjacent to Building 730.** This proposed project would provide a new two-story, 3,434-ft² facility between Aspen and Vail Streets and directly adjacent to Building 730. This project would be scheduled for construction in FY 2009. In order to accommodate personnel for this facility, approximately 18,000 ft² of new parking would be needed.
- **Project No. 3. Construct 310 MSG Medical Squadron Facility Adjacent to Building 600.** This proposed project would provide a new two-story, 10,882-ft² facility between Beaver Creek and Aspen Street. This project would be scheduled for construction in FY 2009. There is no associated parking being built with this facility, as there is currently sufficient existing parking to accommodate new personnel.
- **Project No. 4. Construct 310 MSG CES Facility Near to Building 1005.** This proposed project would provide a new two-story, 11,960-ft² facility to support the CES. The location of this building would be between Camp Hale Way and Aspen Street near to Building 1005. This project would be scheduled for construction in FY 2009. There is no associated parking being built with this facility, as there is currently sufficient existing parking to accommodate new personnel.
- **Project No. 5. Construct 310 MSG Security Forces Squadron Facility at Aspen Street and Camp Hale Way.** This proposed project would provide a new two-story, 9,375-ft² facility to provide a Security Forces Squadron Training Facility. This project would be scheduled for construction in FY 2008. In order to accommodate personnel for this facility, approximately 21,000 ft² of new parking would be needed.
- **Project No. 6. Construct ARPC Administrative Facility West of Aspen Way.** This proposed project would provide a new two-story, 133,534-ft² administrative facility for activities that involve administrative requirements, consolidated training and storage, records storage, promotion board records and promotion board working center, security areas, computer main server and operations area, and training classrooms. This project would be scheduled for construction in FY 2009. In order to accommodate this facility a two-story parking garage with approximately 135,000 ft² of new parking would be needed.
- **Project No. 7. Construct 310 MSG Headquarters Facility West of Aspen Way.** The proposed 26,400-ft² Headquarters facility would be just west of the ARPC facility. This project would be scheduled for construction in FY 2009. In order to accommodate this facility, approximately 21,000 ft² of new parking would be needed.
- **Project No. 8. Mississippi Gate Upgrades and Construction of a New West Gate.** Under this proposed project, the south Mississippi Gate would be upgraded to include an additional entrance lane and covered inspection area. On the western boundary of Buckley AFB a new West Gate would be added near the intersections of Devil's Thumb Avenue and Telluride Street. The West Gate would include a Visitor Center, gatehouse and associated infrastructure, privately owned vehicle (POV) inspection facility, traffic calming measures, canopy, crash protection devices,

cameras, lighting, ID check stations, an overwatch, and a final barrier and containment system (vehicle arresting system). The West Gate would require approximately 3,000 ft² of building space. New roads for entrance and exit from the base would also be required. The West Gate would be scheduled for construction in FY 2014.

- **Project No. 9. Expansion of Aspen Way and Infrastructure Improvements.** Expansion and extension of Aspen Way is proposed to join Beaver Creek and Aspen Street to accommodate increased traffic. Expanded bridge work would be required to avoid wetlands and a new drainage pipe would be installed. In order to sufficiently support the above-mentioned facilities, new infrastructure (gas, potable water, sanitary sewer, storm sewer, electrical, and communications) and utility improvements would be needed as well. This project would be scheduled for construction in FY 2008.

Table 2-1 shows the approximate linear footage required for the necessary utilities to support the proposed facilities, West Gate and Mississippi Gate improvements, and road upgrades.

Table 2-1. Proposed Utility and Road Distances for Infrastructure Improvements

Project Number	Proposed Facility/Project	Gas	Potable Water	Sanitary Sewer	Electrical	Communications	Storm Sewer	Roads
1	310 MSG Consolidated Training and Storage	250 ft	255 ft	265 ft	230 ft	255 ft	285 ft	300 ft x 20 ft
2	310 MSG Communications Squadron	320 ft	200 ft	175 ft	820 ft	820 ft	175 ft	150 ft x 20 ft
3	310 MSG Medical Squadron	490 ft	0 ft	180 ft	520 ft	400 ft	100 ft	0 ft
4	310 MSG CES	100 ft	0 ft	350 ft	300 ft	300 ft	350 ft	0 ft
5	310 MSG Security Forces Squadron	0 ft	100 ft	150 ft	0 ft	140 ft	400 ft	100 ft x 20 ft
6	ARPC Administrative Facility	575 ft	325 ft	350 ft	900 ft	500 ft	300 ft	300 ft x 20 ft
7	310 MSG Headquarters	575 ft	325 ft	350 ft	900 ft	500 ft	300 ft	0 ft
8	West Gate	500 ft	500 ft	500 ft	500 ft	500 ft	500 ft	700 ft x 40 ft
	Mississippi Gate	0 ft	0 ft	0 ft	100 ft	0 ft	0 ft	400 ft x 20 ft
9	Aspen Way Expansion	0 ft	0 ft	0 ft	0 ft	0 ft	0 ft	300 ft x 20 ft

Source: BAFB 2007c

Notes: It is assumed that utility lines would not cross land constraints and proposed sites with existing facilities would not need new utility lines.

ft = feet

2.2.2.2 Proposed Personnel Changes

The Proposed Action would result in the addition of approximately 450 full-time ARPC and 350 full-time and part-time personnel to form the 310 MSG. There would be no increase in personnel associated with the addition of the three back-up F-16 aircraft to the 140 WG.

2.2.2.3 Proposed New Aircraft and Associated Operations

Under the Proposed Action, three additional aircraft would be reassigned to Buckley AFB and would be used only as backup for the existing aircraft in the event one or more F-16 aircraft are not available to fly. There would be no change in the flight tracks, profiles, flying hours, and airspace to the existing F-16 aircraft at Buckley AFB. No construction is associated with the gain of the three F-16 aircraft. **Table 2-2** presents information on current and proposed aircraft operations for the 140 WG. As shown, the number of based F-16 aircraft would increase by 20 percent; the number of sorties would remain the same. A sortie is defined as a takeoff, a landing, and any closed-pattern activities the aircraft might fly.

Table 2-2. Current and Proposed Aircraft Activity for the 140 WG

	Current (2005)	Proposed Action	Percent Increase
Number of F-16 aircraft	15	18	20.0
Total annual flying hours	3,416	3,416	0
Total annual sorties	2,207	2,207	0
Average airfield daily sorties *	8.5	8.5	0

Source: Larsen 2006

Note: * Assumes 264 annual flying days

2.2.3 Alternative B – Utilization of Existing Facilities and Combination of Similar Activities

Under this alternative, the new 310 MSG moving to Buckley AFB would share existing facilities with the 460 SW and some of the 310 MSG squadrons would co-exist with 460 SW squadrons performing similar functions. For example, the Medical Groups, CESs, and the Security Forces would operate together in existing 460 SW facilities. The existing clinic at Buckley AFB is presently fully occupied and meeting the requirements of the existing military population associated with the 460 SW. There is insufficient space to accommodate the 310 MSG Medical Group. The existing facility housing the 460 CES is also presently occupied to the maximum capacity of the facility. Not only is the 460 SW Security Forces facility fully occupied, but the 460 SW and the 310 MSG Security Forces have very different functions and shared facilities would be impractical.

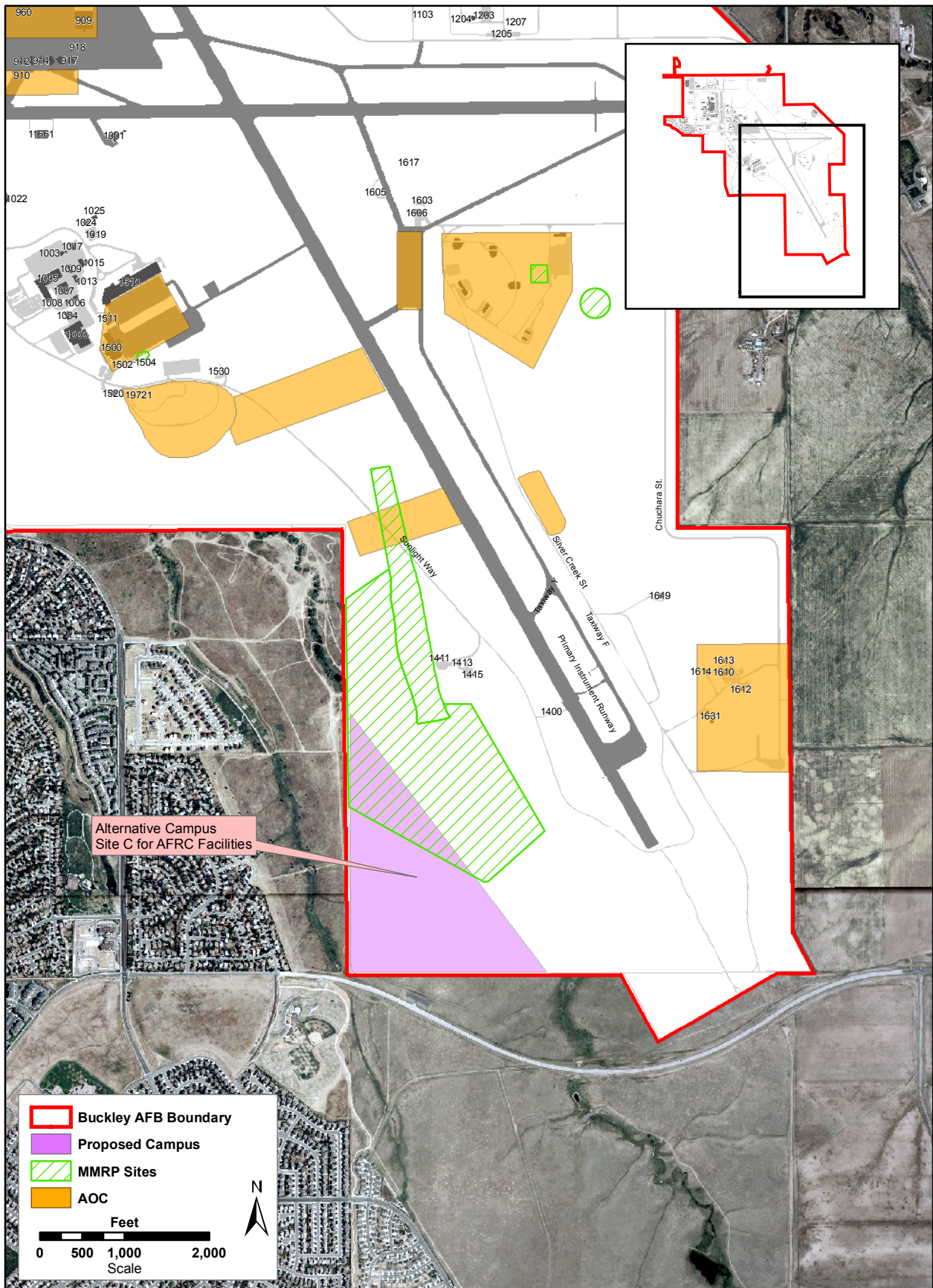
Buckley AFB was once an Air National Guard installation and was recently returned to the active Air Force. During this transition, many new facilities had to be built, are under construction, or have not yet started construction to stand up the 460 SW. There are extremely limited facilities available on the base for existing functions, much less than what is needed to accommodate the 2005 BRAC Commission actions. There are no facilities available on Buckley AFB that could meet the requirements of the 133,534-ft² facility needed by the ARPC. Although this alternative has the potential for less impact on environmental resources, including wetlands, this alternative for combining some similar functions in existing facilities does not meet Criterion D from **Section 2.3** and is therefore not further evaluated in detail in **Sections 3 and 4** of the EA.

2.2.4 Alternative C – Southwestern Site

Under this alternative, a campus of several facilities would be constructed on the southwestern portion of the base, as depicted in **Figure 2-3**. This is an available 39-acre parcel of land sufficient to accommodate all required facilities in the same area. This alternative would keep all personnel and functions together in a campus-type setting. The area is hilly, contains heavy brush and shrubs, and wetlands. These existing environmental conditions would require extensive grading and filling to allow for construction of a large campus, resulting in substantial effects on wetlands and natural resources. This alternative has the potential for greater wetland impacts than Alternative A because of the East Toll Gate Creek and nearby wetlands. In addition, this area is identified as containing unexploded ordnance (UXO) and land use is designated as a natural area. Constructing this campus in the southwestern portion of the base would isolate the personnel from close access to daily required resources, such as the service station, the commissary, and the Base Exchange (BX). This would result in numerous vehicular trips by hundreds of personnel on a daily basis, thus increasing the amount of daily vehicle traffic and associated air pollutants in a county that is already in nonattainment status under the Clean Air Act (CAA). Since this area is near the edge of the southern part of the base, there is the potential for the base to tie into the water and sewer lines that run nearby. However, it is estimated that the cost to the government to tie into these utilities would exceed \$2 million. In addition, the required secure communication lines would have to be run more than 5 miles to the southern part of the base to serve the 310 MSG. The existing road structures in the southwestern corner of the base are insufficient to support this alternative, and adequate upgrades of the roads would require substantial effects on wetlands along the existing route. This would result in additional costs not required if the facilities were constructed in the developed area of the base. Although the project for upgrading the Mississippi Gate is in this same area, the cost of remediation and time for the road work required would be far less than the cost and time to remediate the required acres in preparation of the southwestern site for building the campus. Because of the high potential costs for remediation, potential adverse environmental impacts, impacts on the East Toll Gate Creek, and wetland impacts this alternative does not meet Criteria A or B from **Section 2.3** and is therefore not further evaluated in detail in **Sections 3** and **4** of the EA.

2.2.5 Alternative D – Combined Use of Two Areas in Northwest

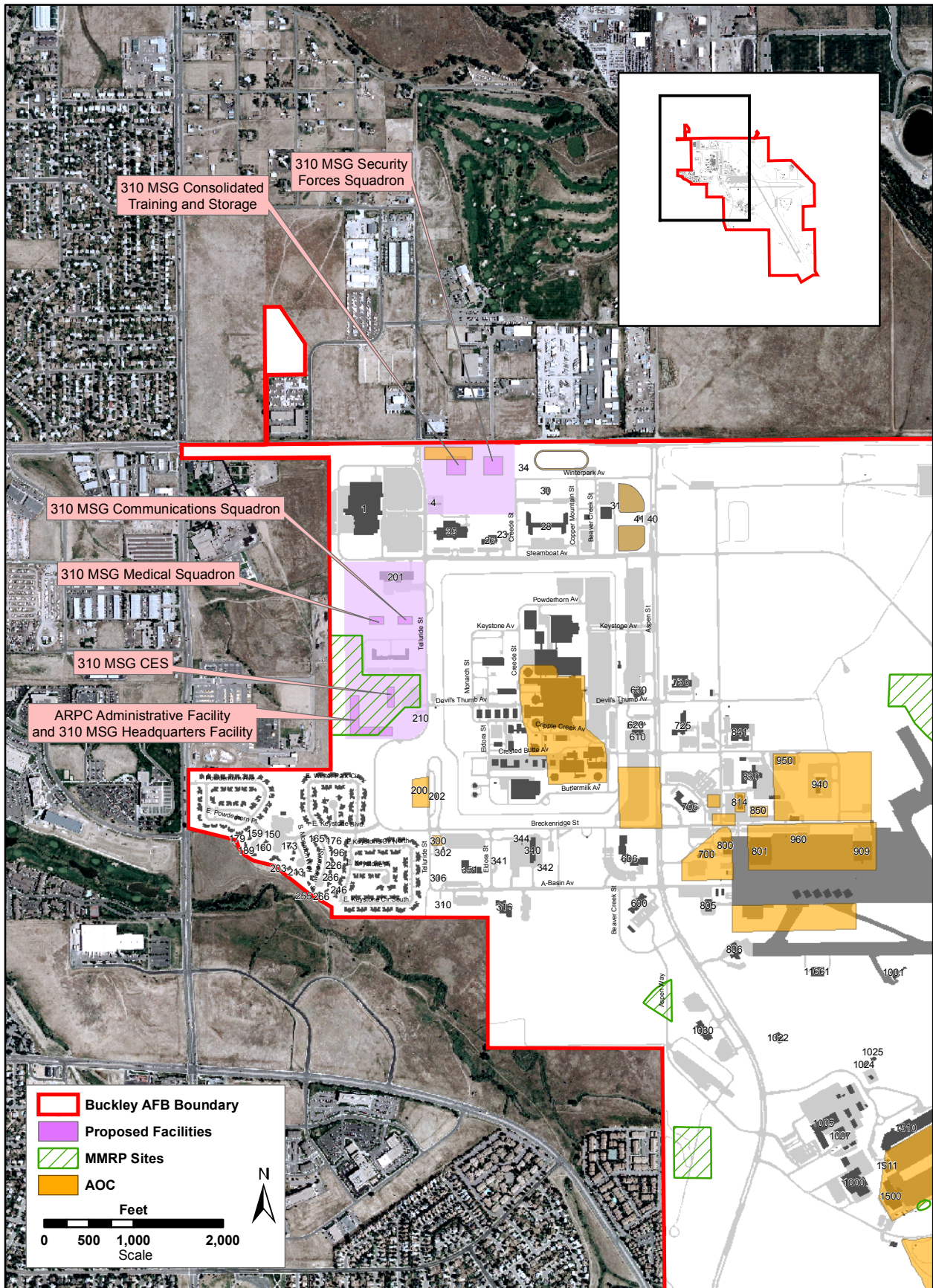
Under this alternative, the new required facilities would be built in two separate areas in close proximity in the northwestern portion of the base: (a) the areas north of Steamboat Avenue and east of Telluride Street, and (b) south of Steamboat Avenue and west of Telluride Street (see **Figure 2-4**). The combination of these two parcels would accommodate the new facilities. A portion of the site south of Steamboat Avenue and west of Telluride Street would conflict with the proposed West Gate. Additionally, the Base General Plan indicates this area is already in the planning stage for the construction of new dormitories and recreational fields. The area north of Steamboat Avenue and east of Telluride Street is suspect for asbestos-containing material (ACMs) and could require extensive remediation. Remediation costs for Alternative D would also increase due to an existing Military Munitions Response Program (MMRP) site between Telluride Street and the base perimeter in the area proposed for Alternative D. The cost and time involved for remediation of these areas to accommodate the 2005 BRAC Commission required timeline would be cost prohibitive because extensive excavation would be involved to remediate the proposed sites. Although this alternative has the potential for less environmental and wetland impacts than the preferred alternative, it does not meet Criterion A from **Section 2.3** and is therefore not further evaluated in detail in **Sections 3** and **4** of the EA.



Sources: Proposed Facilities: eTM, Inc. 2006; AOC and MMRP Sites: BAFB 2007c, BAFB 2007d

Figure 2-3. Proposed Location of a 310 MSG Campus at a Southwestern Site Under Alternative C Buckley AFB, Colorado

May 2008



Sources: Proposed Facilities: e2M, Inc. 2006; AOC and MMRP Sites: BAFB 2007c

Figure 2-4. Proposed Locations of Facilities Under Alternative D

2.3 Process Used to Develop Alternatives

During the process of developing alternatives to the Proposed Action to be considered in this EA, a set of criteria for the selection of alternatives was established. The criteria for selection are as follows:

- A. The alternative must be economically feasible.
- B. The alternative must minimize the effects on environmental and socioeconomic resources and environmental justice.
- C. The alternative must keep functional organizations together to the fullest extent practicable.
- D. The alternative must provide adequate space to carry out the specified missions.
- E. The alternative must satisfy the purpose and need of the Proposed Action, as identified in **Section 1.2**.

2.3.1 History and Development Process of Alternatives

In an effort to satisfy the purpose of and need for the Proposed Action, several criteria were developed to compare and contrast alternative means of fulfilling the objectives of the Proposed Action in accordance with 32 CFR 989.8 (c).

Selection Criteria for Alternatives. Key selection criteria include economic feasibility, level of anticipated environmental and socioeconomic effects, functional organization of facilities, availability of adequate space to carry out the specified missions, and the ability to meet the purpose and need of the action as identified in **Section 1.2**.

2.3.2 Alternatives Eliminated from Detailed Study

Three sites were considered for the location of the new facilities for the Proposed Action, as well as one alternative which considered combining uses. After evaluating existing infrastructure and utilities, Alternative C was removed from evaluation because of the prohibitive cost and potential environmental effects from infrastructure and road upgrades. Alternative D was removed from consideration because there is the possibility of ACM at one of the two proposed locations, and the other location contains an MMRP site that would need to be remediated. Additionally, the area for Alternative D is already planned for other development. Constructing the proposed facilities under Alternative D would require substantial excavation at the suspected ACM site and MMRP site, as opposed to Alternative A, which would only require surface disturbance for the new West Gate. Therefore, under Alternative D, costs could substantially increase due to investigation and remediation of the suspected ACM site and the MMRP site prior to construction. In addition, the location of facilities under Alternative D would interfere with the location of the proposed West Gate. Organizing similar functions under Alternative B would be costly and inefficient; Buckley AFB's Clinic, Engineer Squadron, Communications Squadron, and Security Forces Squadron are all at capacity and could not accommodate the 310 MSG. **Table 2-3** summarizes the possible sites and anticipated constraints for the proposed facilities at Buckley AFB under the alternatives eliminated from detailed study.

2.4 Summary Comparison of the Activities, the Predicted Achievement of the Project Objectives and the Predicted Environmental Effects of the Alternatives

Activities necessary for accomplishing the Proposed Action would allow for the addition of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi

Table 2-3. Constraints of Alternative Locations

Alternative Locations	Constraints
Alternative B – Use of Existing Facilities and Combination of Similar Activities	The facilities for the current Clinic, Engineer, Communications, and Security Forces Squadron’s at Buckley AFB are at capacity and could not accommodate the 310 MSG.
Alternative C – Southwestern Campus	Costly infrastructure upgrades, remoteness from base activities, potential adverse environmental impacts, and extensive road construction would be required.
Alternative D – Northwestern Locations	Possible asbestos contamination would require remediation, MMRP site would require remediation, future planned use of lots, interference with location of proposed West Gate, limited parking areas, and distance from other facilities.

Gate; and relocation of three back-up F-16 aircraft from Springfield-Beckley Municipal Airport Air Guard Station, Ohio, to Buckley AFB.

Alternatives A, C, and D require construction, while Alternative B does not. Alternatives B, C, and D do not meet the criteria established for selection in **Section 2.3**. **Table 2-4** shows a comparison of the five alternatives and whether or not they meet the selection criteria outlined in **Section 2.3**.

Table 2-4. Comparison of Alternatives with Selection Criteria

	No Action Alternative	Alternative A	Alternative B	Alternative C	Alternative D
Alternative must be economically feasible	Yes	Yes	Yes	No	No
Alternative must be committed to minimizing the impact on environmental and socioeconomic resources and environmental justice	Yes	Yes	Yes	No	Yes
Alternative must give priority to keeping functional organizations together	No	Yes	Yes	No	Yes
Alternative must provide adequate space to carry out the specified missions	No	Yes	No	Yes	Yes
Alternative meets the purpose and need of Proposed Action as identified in Section 1.2	No	Yes	No	Yes	Yes

Table 2-5 compares the environmental effects of the No Action Alternative and Alternative A, the Proposed Action. **Table 2-6** lists recommended BMPs for each alternative and **Table 2-7** lists required mitigation for each alternative.

Table 2-5. Summary Comparison of Predicted Environmental Effects of the Alternatives

Environmental Resource Areas	No Action Alternative		Alternative A – Proposed Action	
	Short-term	Long-term	Short-term	Long-term
Noise	No impacts would be expected	No impacts would be expected	Minor adverse effects	Minor adverse effects
Land Use	No impacts would be expected	No impacts would be expected	Negligible effects on-base and no adverse off-base effects	Negligible effects on-base and no adverse off-base effects
Air Quality	No impacts would be expected	No impacts would be expected	Minor adverse effects	Minor adverse effects
Geological Resources	No impacts would be expected	No impacts would be expected	Minor adverse effects	Minor adverse effects
Water Resources	No impacts would be expected	No impacts would be expected	Minor adverse effects	No adverse effects
Biological Resources	No impacts would be expected	No impacts would be expected	Moderate adverse effects	Moderate adverse effects
Cultural Resources and Viewshed	No impacts would be expected	No impacts would be expected	No adverse effects	No adverse effects
Socioeconomic Resources	No impacts would be expected	No impacts would be expected	Minor beneficial effects	No adverse effects
Utilities	No impacts would be expected	No impacts would be expected	Minor to moderate adverse effects	Minor to moderate adverse effects
Transportation/Traffic	Negligible adverse impact	Negligible adverse impact	Minor adverse effects	Moderate adverse effects
Hazardous Materials and Waste	No impacts would be expected	No impacts would be expected	No adverse effects	No adverse effects

Table 2-6. Recommended Best Management Practices

Environmental Resource Areas	No Action Alternative	Alternative A–Proposed Action
Noise	None	<ul style="list-style-type: none"> • Use of construction equipment with noise suppression.
Land Use	None	<ul style="list-style-type: none"> • None.
Air Quality	None	<ul style="list-style-type: none"> • Dust suppression and adherence to air permit requirements.
Geological Resources	None	<ul style="list-style-type: none"> • BMPs related to NPDES for Construction Sites and for MS4. • Fugitive dust from construction activities would be minimized by watering and soil stockpiling. • Implementation of standard erosion-control practices (e.g., silt fencing, sediment traps, application of water sprays, phased construction, and prompt revegetation of disturbed areas).
Water Resources	None	<ul style="list-style-type: none"> • BMPs related to NPDES for Construction Sites and for MS4. • Limit stockpiling of materials onsite. • Manage stockpiled materials to minimize the time between delivery and use. • Cover stockpiled materials. • Install snow or silt fences around material stockpiles, storm water drainage routes, culverts, and drains. • Install hay or fabric filters, netting, and mulching around material stockpiles, storm water drainage routes, culverts, and drains.
Biological Resources	None	<ul style="list-style-type: none"> • Sediment and erosion control for wetlands. • Revegetate the nonfacility construction footprint with native species. • All equipment will be clean and free of seeds and soil prior to being brought on to Buckley AFB to prevent the spread of invasive species. • Prior to construction, the wetlands in the area of the proposed construction would be delineated. • Avoid and minimize potential impacts on shelterbelt plantings. • Any groundbreaking construction activities should be performed before migratory birds return to the base (approximately 15 March) or after all young have fledged (approximately 31 July) 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, removal of prairie dogs and filling their burrows, and use of various excluders (e.g., noise). Birds can be harassed to <i>prevent</i> them from nesting on the site. Once a nest is established, they cannot be harassed without a U.S. Fish and Wildlife Depredation Permit until all young have fledged and are capable of leaving the nest site.

Environmental Resource Areas	No Action Alternative	Alternative A–Proposed Action
Biological Resources (cont'd.)		<ul style="list-style-type: none"> • 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 survey, buffer areas will 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 nesting burrowing owls are present, a 150-foot (45.72-meter) buffer would be established around active nest sites during the breeding season to protect owls from disturbances associated with construction. • For Project Nos. 1, 3, 5, 6, 7, and 9, any storm water containment requirements should consider improvements to and utilization of the existing wetlands and drainage east of Aspen Way.
Cultural Resources and Viewshed	None	<ul style="list-style-type: none"> • Although no known cultural resources exist at this site, should any historic or prehistoric resources be discovered during excavation, work will cease until any discovered resources are checked for historic significance.
Socioeconomic Resources	None	<ul style="list-style-type: none"> • None.
Utilities	None	<ul style="list-style-type: none"> • Sediment and erosion control BMPs in accordance with NPDES-related permits for construction and MS4.
Transportation/Traffic	None	<ul style="list-style-type: none"> • Sequence infrastructure, road, and utility upgrades to minimize effects on traffic flow at any given time. Use of traffic personnel to guide traffic around construction areas that affect roads. Provide adequate warning to base population when a construction project might impact roads and traffic flow on Buckley AFB.
Hazardous Materials and Waste	None	<ul style="list-style-type: none"> • Spill prevention, alternatives to hazardous materials. • Obtain 460 CES/CEV approval for all hazardous materials used and hazardous wastes generated on the base. • Ensure hazardous wastes are managed per 40 CFR and transported in accordance with 49 CFR to a certified disposal facility. • Ensure proper labeling, handling, segregation, collection, and storage of hazardous waste. • Ensure all personnel are properly trained for handling the hazardous waste they generate. • Ensure the 460 CES/CEV is given notice when scheduling waste disposal requiring a manifest, before it is transported off base. • If ACM is discovered during site work, it would be removed according to Federal, state, and local regulations. Soil sampling would be utilized to ensure that soil is clean prior to construction starting. • Building materials for new construction would not contain asbestos.

Table 2-7. Mitigation Required by Alternative

Environmental Resource Areas	No Action Alternative	Alternative A–Proposed Action
Noise	None	None
Land Use	None	None
Air Quality	None	None
Geological Resources	None	None
Water Resources	None	Replacement of wetlands under USAF's no-net loss policy for wetlands
Biological Resources	None	None
Cultural Resources and Viewshed	None	None
Socioeconomic Resources	None	None
Utilities	None	None
Transportation/Traffic	None	None
Hazardous Materials and Waste	None	None

2.5 Identification of the Preferred Alternative

The USAF considers both general and specific siting criteria for construction of new facilities. General siting criteria include consideration of compatibility between the functions to be performed and the base land use designation for the site, adequacy of the site for the function required, proximity to related activities, distance from incompatible activities, availability and capacity of proximate roads, efficient use of property, development density, potential future mission requirements, and special site characteristics including environmental incompatibilities. Specific siting criteria include consideration of the location of the workforce and efficient management of functions. Collocation of similar types of functions, as opposed to dispersion, typically permits more efficient use of equipment, vehicles, and other assets.

Alternative A meets all criteria listed in **Section 2.3**, is the Preferred Alternative, and will be the Proposed Action carried through the EA and analyzed in detail. This alternative meets all criteria and objective mission requirements as recommended by the 2005 BRAC Commission. It would allow for the addition of new facilities at Buckley AFB, associated infrastructure, a new West Gate, upgrades at Mississippi Gate, and the reassignment of three back-up F-16 aircraft. It would allow the Department of Defense (DOD) to comply with the recommendations of the 2005 BRAC Commission in a timely and cost-efficient manner.

2.6 Activities Contributing to Cumulative Impacts

This section describes the past, present, and reasonably foreseeable actions at and near Buckley AFB that compose the cumulative effects scenario for the BRAC actions. The potential cumulative effects associated with implementing the Proposed Action are described in **Section 4** within each alternative. Data to support the cumulative impact analyses are contained in **Appendix E**.

2.6.1 Off-Base Activities

The land adjacent to Buckley AFB is developed, agricultural, and grassland conservation areas. Buckley AFB is surrounded by the City of Aurora, Colorado, except for a parcel of land abutting the base boundary on the east, which is Arapahoe County. The City of Aurora's *2003 Comprehensive Plan* (Aurora 2003) identifies three planning areas near the base, each of which has its own identity and planned development pattern.

Colfax Corridor East of I-225. This area occurs adjacent to the northern boundary of Buckley AFB. The properties along Colfax Avenue include older commercial uses, and vacant buildings. The Northeast Colfax Area also includes the neighborhoods that are north and south of the corridor.

Strategies for development in this area include the following:

- Working to enhance open-space corridors through additional dedications or other means; confining nonresidential uses to the corridor and to the planned industrial areas with the exception of neighborhood commercial or neighborhood institutional uses
- Locating multifamily and attached housing in appropriate areas, including those adjacent to major streets, similar existing housing types, and other properties in the corridor
- Promoting infill development in residential neighborhoods, maintaining the overall average residential density close to the current benchmarks
- Encouraging and supporting the consolidation of parcels in the corridor to allow well-planned businesses or mixed-use projects.

There are no known developments that would occur in this strategic area at this time.

I-225 Corridor and City Center Strategic Area. This area is to the west of Buckley AFB and is associated with I-225 and the Aurora City Center. The I-225 corridor is the geographic center of the City of Aurora and, on the east side of the highway, the Aurora Mall, Aurora City Place, and Abilene power corridors compose a regional retail location. Midway in the corridor lies the Aurora City Center, historically planned as the city's "downtown."

Strategies for development in this area include the following:

- Continuing to work for transportation improvements including improvements to interchanges and Park-n-Ride locations
- Developing a strategy to encourage adaptive reuse of empty big box retail buildings
- Encouraging additional retail and medical-related office development in the corridor
- Working to expand the restaurant node at Iliff Avenue.

Important development associated with the City Center includes the Aurora Municipal Center (complete), Arapahoe County administrative annex (complete), new ADT company office building, a 355-unit townhouse and elevator apartment complex (The Village), a 225-residential unit project (The Retreat at City Center), and a revitalization of the Aurora Mall. In addition, the Regional Transportation District (RTD) purchased property for development of a new bus transfer facility at the City Center. A light rail station could be constructed in the future. Finally, a much smaller single-family housing development taking up 36.5 acres is under construction approximately 0.5 mile west of Buckley AFB (Aurora 2003, Aurora 2006a).

E470 Corridor Strategic Area. This area is adjacent to the eastern and extreme southern boundary of the base and includes the prairie areas east of the developed portion of the city where development is expected through 2020. The major feature of this area is the E470 corridor from Denver International Airport (DIA) in the north to Douglas County in the south. E470 is a major highway running north-south near the eastern boundary of Buckley AFB. The 1999 completion of the E470 segment serving the Buckley AFB area, and the subsequent Jewell Avenue Extension, provides the base with major highways on both its eastern and western sides with access to both the north and south gates. The E470 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 City of Aurora's 2003 *Comprehensive Plan* identifies regional activity centers and the following theme areas within the corridor (Aurora 2003):

- Airport Corporate
- Airport Commercial/Distribution
- Regional Retail/Commercial
- Light Industrial/Flex Office
- Buckley Research and Development
- Residential
- Regional Park and Open Space
- Recreation/Entertainment.

Strategies for development in the E470 Corridor Strategic Area include locating a major office park, retail centers, and airport-related activities in the corridor and working with the counties to ensure that critical, undeveloped enclaves of land in the corridor are annexed into Aurora.

Planned land use for the entire area abutting the eastern boundary of Buckley AFB is to incorporate the Buckley Research and Development theme. Small-scale office development is allowed to complement the Research and Development land use, and limited industrial and commercial services are permitted. Regionally, a residential development taking up 435 acres is currently under construction within 0.5 mile of the southern limits of Buckley AFB. Just east of this development, a 490-acre residential development is also under construction (Aurora 2003).

2.6.2 On-Base Activities

Buckley AFB has a General Plan (BAFB 2005a), one chapter of which is dedicated to land use planning to guide current and future development. 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 goals and provides starting points to discuss land acquisition or disposal actions and siting of new facilities. This plan helps to define the best layout of land uses and transportation corridors to support functional effectiveness, efficiency, and compatibility. Both on- and off-base factors are considered. The General Plan guides infill development on currently vacant land, functional consolidation, and redesignation of land uses to accommodate doubling of the base's current population (BAFB 2005a).

There are a number of recent, current, and planned projects to support Buckley AFB's continuing transition from an Air National Guard Base (ANGB) to an AFB and to facilitate future growth for tenants. As the prioritization, initiation, and completion of construction projects are dynamic, **Appendix C** represents the current schedule at the time of this EA; scope, priority, and schedule of individual projects could change.

2.6.3 Proposed Consolidated Facility at the Aerospace Data Facility

Buckley AFB is currently preparing an EA for the Proposed Consolidated Facility (CF) at the Aerospace Data Facility (ADF). The EA being prepared evaluates the Proposed Action to implement a new administrative/data processing building with up to 635,000 square feet (ft²) 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. As a result of the proposed CF at the ADF an additional 700 personnel would be at Buckley AFB.

3. AFFECTED ENVIRONMENT

This section describes the current conditions for resources that might be impacted by the Proposed Action including noise, land use, air quality, geological resources, water resources, biological resources, cultural resources and viewshed, socioeconomic resources, utilities, transportation/traffic, and hazardous waste and materials.

3.1 Noise

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on the roof. Sound is measured with instruments that record instantaneous sound levels in decibels.

A-weighted decibels (dBA) are used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. All sound levels analyzed in this EA are A-weighted.

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. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. Affected receptors are specific (i.e., schools, churches, or hospitals) or broad areas (e.g., nature preserves or designated districts) in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Regulations and Metrics. Federal 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 following paragraphs describe the guidelines and regulations that are relevant to the project.

Weighted Sound Levels. Noise levels, resulting from multiple single events are used to characterize community noise effects from aircraft operations, or sustaining road and building construction activity, and are measured using the Day-Night Average A-weighted Sound Level (DNL) metric with the noise levels expressed in dBA. This noise metric incorporates a "penalty" for 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 sound exposure level values for a given 24-hour period. DNL is the preferred noise metric of the U.S. Department of Housing and Urban Development (HUD), Federal Aviation Administration (FAA), USEPA, and DOD for modeling airport environs.

According to USAF, FAA, and 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 levels between the 65 and 75 dBA, and "normally acceptable" in areas exposed to noise levels of a DNL of 65 dBA or lower. The Federal Interagency Committee on Noise (FICON) developed land-use compatibility guidelines for noise in terms of DNL (FICON 1992). For outdoor activities, USEPA recommends a DNL 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). DNL is the metric recognized by the U.S. government for measuring noise and its effects on humans.

Ambient Sound Levels. Noise levels in residential areas vary depending on the housing density and location. A normal sound level for a suburban residential area is a DNL of about 55 dBA, which increases to 60 dBA for an urban residential area, and 80 dBA in the downtown section of a city.

Most people are exposed to sound levels of a DNL of 50 to 55 dBA or higher on a daily basis. Studies specifically conducted to determine noise effects on various human activities show that about 90 percent of the population is not significantly bothered by outdoor sound levels below a DNL of 65 dBA (USDOT 1984). Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments and that there is a consistent relationship between DNL and the level of annoyance.

Although the communities surrounding Buckley AFB are typical of an urban atmosphere, the noise environment in the vicinity of Buckley AFB is dominated by aircraft operations and vehicular traffic. Commercial facilities are also prevalent in the area.

Personnel currently working at the base use several exit and entry points into Buckley AFB, most notably the main gate at Aspen Street and 6th Avenue. Noise from vehicular traffic adjacent to Buckley AFB adds to the ambient noise environment.

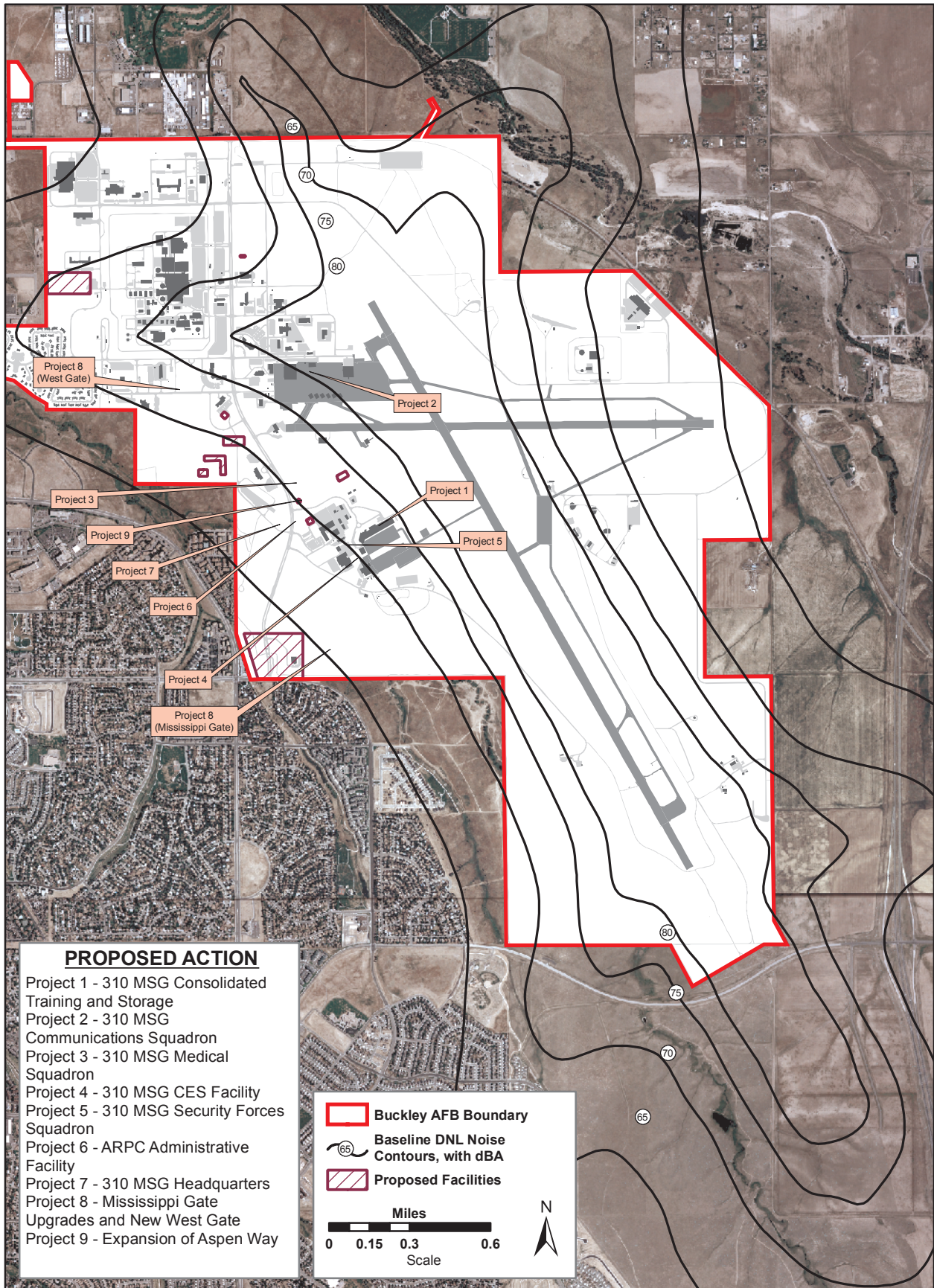
Several other airports exist in the vicinity of Buckley AFB. Centennial Airport is approximately 10.5 miles southwest of Buckley AFB. DIA is approximately 11.5 miles north, and Front Range Airport is approximately 13 miles northeast. All of these airports contribute to the noise environment around Buckley AFB.

Based aircraft at Buckley AFB include the F-16 aircraft; the Chinook, Black Hawk, Huey, and Kiowa Rotorcraft; turboprop aircraft; and transient military aircraft. Noise contours for the baseline scenario are shown in **Figure 3-1**. Baseline contours in **Figure 3-1** are generated from the 2006 Buckley Air Installation Compatible Use Zone (AICUZ) data (BAFB 2006c). They extend off-installation in all directions around Buckley AFB, extending further off the ends of Runway 14/32 to the northwest and southeast than to the northeast and southwest.

On an annual basis, there are approximately 2,207 sorties flown by F-16 aircraft at Buckley AFB. A sortie is the entire flight path of a military aircraft which includes the takeoff, landing, and any closed-pattern activities the aircraft might fly. As shown in **Table 2-2**, there are approximately 8.5 F-16 aircraft sorties at Buckley AFB per day.

Construction Sound Levels. Building construction, modification, and demolition work can cause an increase in sound that is well above the ambient level. A variety of sounds come from graders, pavers, trucks, welders, and other work processes. **Table 3-1** lists sound levels associated with common types of construction equipment that are likely to be used under the Proposed Action. 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.

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.



Sources: Noise Contours: e²M, Inc. 2007

Figure 3-1. Proposed Action Locations in Relation to Noise Contours at Buckley AFB

Table 3-1. Predicted Noise Levels of Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Grading	
Bulldozer	87
Grader	85
Water Truck	88
Paving	
Paver	89
Roller	74
Demolition	
Loader	85
Haul Truck	88
Building Construction	
Generator Saw	81
Industrial Saw	83
Welder	74
Truck	80
Forklift	67
Crane	83

Source: COL 2001

3.2 Land Use

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on 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.”

Buckley AFB occupies approximately 3,283 acres (1,328 hectares) adjacent to the City of Aurora, in Arapahoe County, Colorado, within the Denver metropolitan area. Land use in the vicinity of Buckley AFB is divided into nine categories based on data received from Arapahoe County: agriculture, commercial, industrial and utility, parks and open space, public and semi-public land, residential, vacant, right of way (ROW), and unknown. These land use categories encompass all of the land currently surrounding Buckley AFB. Developed areas, including residential, commercial, and light industrial, border the base to the west and northwest. Land along the northern boundary of the base consists of industrial and open space (e.g., grassland conservation); land to the east consists primarily of recreational and agricultural use; land to the southwest is residential. Future land use northwest of the base is

anticipated to consist of industrial and commercial, and regional park and open space designations are proposed for areas immediately south of the base. The East Toll Gate Creek 100-year floodplain borders the base to the southwest and provides a buffer between the developed areas and the base boundary (BAFB 2005a).

Land uses within Buckley AFB are primarily divided into 14 categories: administrative, aircraft Operations and Maintenance (O&M), airfield, airfield pavements, community commercial, community service, housing unaccompanied, industrial, medical, mission O&M, open space, outdoor recreation, training, and water (see **Figure 3-2**). The land use categories were developed to prevent incompatible siting of facilities and operations. Current land use to the west and east of Aspen Street includes open space, administrative, and some industrial activities south of A-basin Avenue on Buckley AFB. Land use in the vicinity of Telluride Street is composed of open space, mission O&M, and industrial uses. Off-base, the closest land uses to the Proposed Action sites are residential and open space.

3.3 Air Quality

In accordance with the Federal CAA requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these “criteria pollutants” in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The air quality in a region is a result not only of 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.

USEPA developed National Ambient Air Quality Standards (NAAQS) for pollutants that have been determined to affect human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), oxides of nitrogen (NO_x), oxides of sulfur (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 [$\text{PM}_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration allowed to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Appendix A** presents additional information on USEPA regulation of air quality.

The Colorado Air Pollution Control Division (CAPCD) under the Colorado Department of Public Health and Environment (CDPHE) is responsible for implementation of the CAA and has adopted the Federal primary and secondary NAAQS. Buckley AFB is in Arapahoe County, Colorado, within the Metropolitan Denver Intrastate Air Quality Control Region (MDIAQCR). The ROI affected by activities at Buckley AFB is considered to be the entire MDIAQCR.

In December 2003, USEPA proposed to defer the effective date of air quality designations for certain areas of the country that did not meet the 8-hour O_3 NAAQS. The areas with these deferments, known as Early Action Compacts (EAC), agreed to reduce ground-level O_3 pollution earlier than the CAA requires. The MDIAQCR was designated as a nonattainment EAC Subpart 1 area for 8-hour O_3 . However, in November 2007 the USEPA redesignated the MDIAQCR as a maintenance area for 8-hour O_3 . In addition, the MDIAQCR has been designated as a *serious* maintenance area for CO and a *moderate* maintenance area for PM_{10} . The MDIAQCR is in attainment for all other criteria pollutants (USEPA 2005).

Buckley AFB is a major source of criteria pollutants under the Title V program as it has the potential to emit more than 100 tons per year (tpy) of SO_x and 100 tpy of NO_x . Buckley AFB is a minor source of volatile organic compounds (VOCs), CO, and PM_{10} under the Prevention of Significant Deterioration

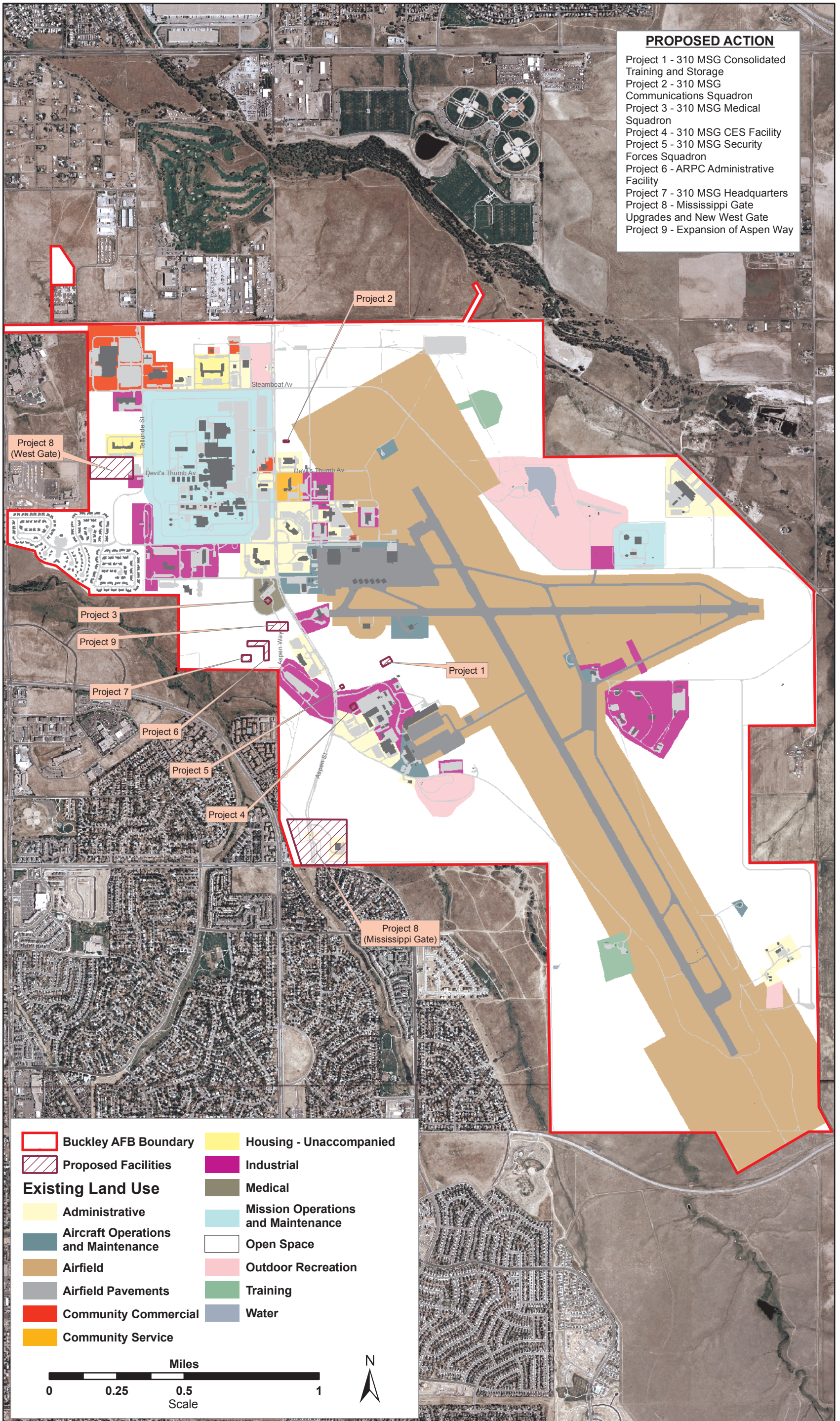


Figure 3-2. Proposed Action Locations in Relation to Land Use at Buckley AFB

(PSD) with a potential to emit less than 250 tpy of these pollutants. Buckley AFB is a PSD synthetic minor source of NO_x because the base has accepted permit limits that establish the potential to emit less than 250 tpy for this pollutant. Buckley AFB has a Title V Operating Permit. Some of the stationary source emitting criteria pollutants consist of natural gas-fired boilers, furnaces and heaters, diesel-fired generators, fuel storage tanks, and degreasers. Buckley AFB is required to prepare an Air Emissions Inventory (AEI) each year. The inventory and records of calculations shall be maintained and made available for Division review upon request. Buckley AFB calendar year (CY) 2006 Stationary Source Air Emissions Inventory and Mobile Emissions for 2003 are presented in **Table 3-2**.

Table 3-2. Buckley AFB CY 2006 Stationary Source Air Emissions Inventory and 2003 Mobile Source Emissions

Pollutant Emissions Sources^a	CO (tpy)	VOC (tpy)^b	SO_x (tpy)	NO_x (tpy)^b	PM₁₀ (tpy)
Buckley AFB 2003 Mobile Emissions	204.50	56.90	2.10	40.60	5.00
Buckley AFB 2006 Point and Fugitive Stationary Source Emissions	11.23	7.21	0.79	45.11	0.74
Total 2003 Mobile and 2006 Stationary Buckley AFB Emissions	215.73	64.11	2.89	85.71	5.74

Notes:

^a The Buckley AFB 2006 AEI (BAFB 2007b) did not assess Pb or PM_{2.5} emissions.

^b VOCs and NO_x contribute to the formation of ground-level ozone.

3.4 Geological Resources

Topography. Topography pertains to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features. Buckley AFB is west of the Great Plains within the western portion of the central high plains of Colorado. The region is surrounded on three sides by higher terrain areas including the Palmer Lake Divide to the south, the Rampart Range and Rocky Mountains to the west, and the Cheyenne Ridge to the north (BAFB 2004). The topography of Buckley AFB consists of relatively flat land and rolling upland. Elevations range from 5,650 feet in the southeastern corner to 5,500 feet in the northwestern corner of the base (BAFB 2004).

Soils. 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. The major soil-mapping units present on Buckley AFB include the Fondis-Weld, Alluvial Land-Nunn, and Renohill-Buick-Little associations (see **Figure 3-3** and **Table 3-3**) (USDA/SCS 1971). Other areas on base have been identified as gravel pits, rock outcrop complexes, sandy alluvial land, and terrace escarpments (USDA/SCS 1971). Soils in the Proposed Action project sites are classified as the Fondis silt loam, 1 to 3 percent slopes, Renohill-Buick loams, 3 to 9 percent slopes, Weld-Deertail silt loam, 0 to 3 percent slopes, and the rock outcrop complex as described in **Table 3-3**. None of these soils associated with the Proposed Action are classified as prime farmland soils (Backhaus 2001).

The Fondis-Weld association mapping unit, composed of the Fondis and Weld soil series, covers the most surface area at Buckley AFB. This association consists of deep loamy soils that formed mainly in silty material deposited by the wind (loess). The Fondis soils are gently sloping (1 to 5 percent slope),

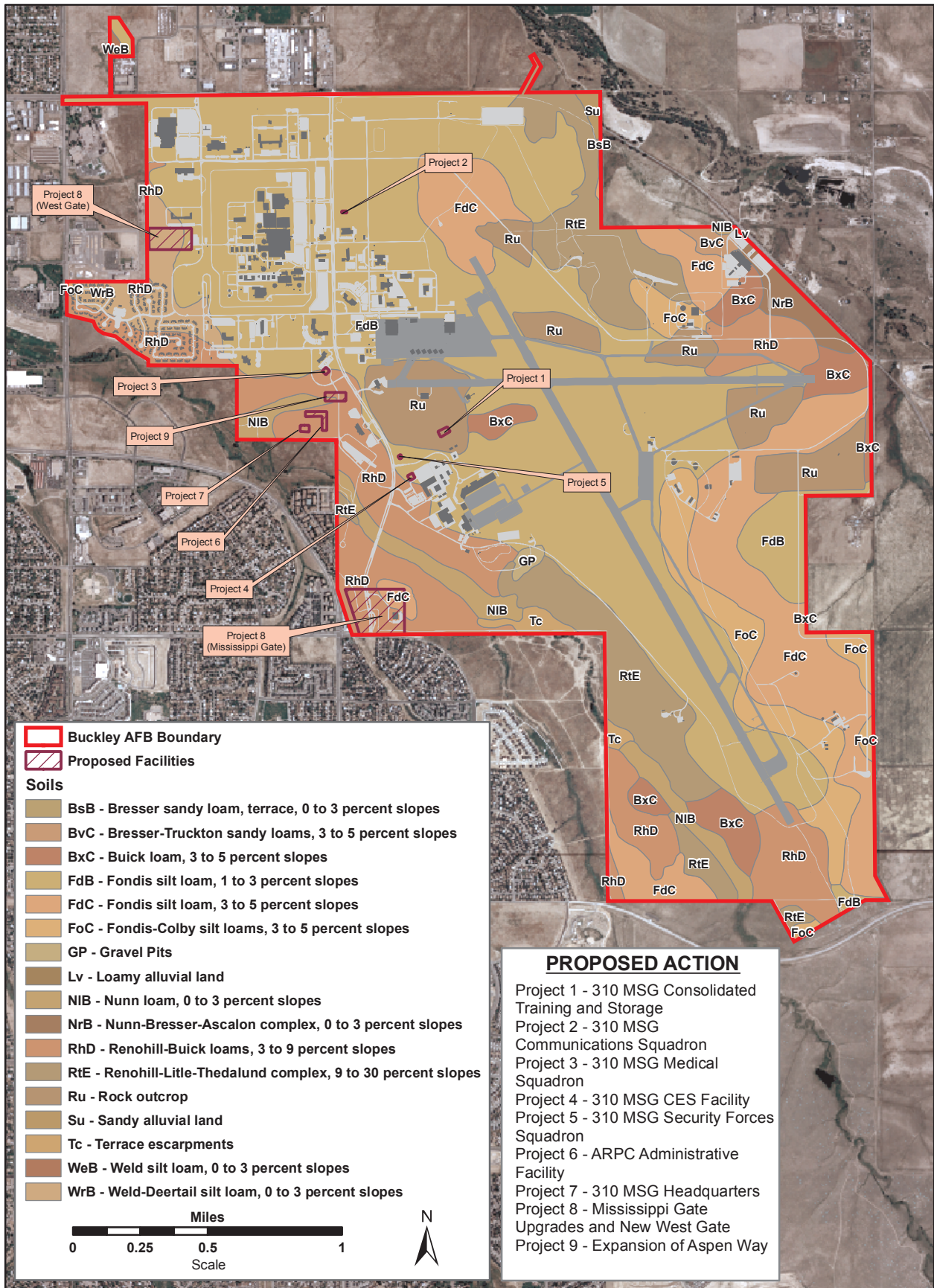


Figure 3-3. Proposed Action Locations in Relation to Soils at Buckley AFB

Table 3-3. Properties of Soil Types Found on Proposed Project Locations at Buckley AFB

Name ^a	Type	Drainage	Properties	Slope ^b (%)
Fondis (FdC)	Silt Loam	Well-drained	Occurs mainly on uplands. Surface layer is approximately 6 inches thick, and rests abruptly on dense clay subsoil about 18 inches thick.	3–5
Renohill-Buick (RhD)	Loam	Well-drained	Sloping to steep, loamy soils that have a loamy to clayey subsoil; moderately deep and deep over shale or sandstone; on uplands.	3–9
Rock Outcrop (Ru)	NA	NA	Soils have been stripped so that interbedded shale and sandstone are exposed at the surface. Shale is dominant, varies in color and texture, is hard and platy, and resists water penetration. The sandstone is very hard and coarse-grained.	NA
Weld-Deertrail (WrB)	Silt Loam	Well-drained	Weld silt loams make up 60–90% of this complex and Deertrail silty clay loams 10–40%. Runoff is slight, and the hazard of soil blowing is moderate.	0–3

Source: USDA/SCS 1971, NRCS 2006

Notes:

^a These names are for soil types not soil associations; soil types can occur in multiple associations. Please see text to determine in which association the soil type most commonly occurs.

^b Slope is the average grade of a particular phase in a soil series. Phases are divisions of soil series defined by differences in textural class, slope degree of erosion, stoniness, or depth to bedrock.

NA = not applicable

well-drained, fertile upland soils with a high water-holding capacity (0.25 inch per inch of soil) and moderately slow permeability (< 0.63 inch per hour), and are susceptible to wind and water erosion. The Weld soil series consists of deep, well-drained, level to gently sloping (0 to 3 percent slope) soils that occur mainly.

in uplands. The Weld soils have a moderate rate of water intake and a high available water-holding capacity (0.20 to 0.25 inch per inch of soil). The most common soils in the Buckley AFB area are the Fondis silt loam and the Fondis-Colby silt loam (USDA/SCS 1971).

The Renohill-Buick-Little association comprises moderately deep, well-drained, loamy to clayey soils. The most common soil series within this association are the Renohill-Little complex and the Renohill-Buick loam. Renohill soils are characterized as being moderately fertile with moderate internal drainage, steep slopes (3 to 30 percent slope), moderately slow to slow permeability (less than 0.63 inch per hour), and moderate water-holding capacity (0.15 inch per inch of soil) (BAFB 2004).

3.5 Water Resources

Groundwater. Groundwater consists of subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Buckley AFB is within the Denver Basin groundwater basin. There are four major bedrock aquifers that underlie Buckley AFB within the Denver Basin: the Denver, Upper Arapahoe, Lower Arapahoe, and Laramie-Fox Hills aquifers. These aquifers are separated by a bed of shale with low permeability and are located 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 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 and Sand creeks and consists of primarily coarse-grained materials. 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 is generally toward the north-northwest along creek beds, toward the South Platte River (BAFB 2004).

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

The South Platte River, approximately 15 miles (27.8 kilometers) northwest of Buckley AFB, is the primary surface water drainage in the region. Several smaller intermittent tributaries within or adjacent to Buckley AFB feed this drainage system. Off-base tributaries include Sand Creek to the north (see **Figure 3-4**) and Murphy Creek to the east. The most prominent surface water feature on the base is Williams Lake, a reservoir in the northeastern section (BAFB 2004).

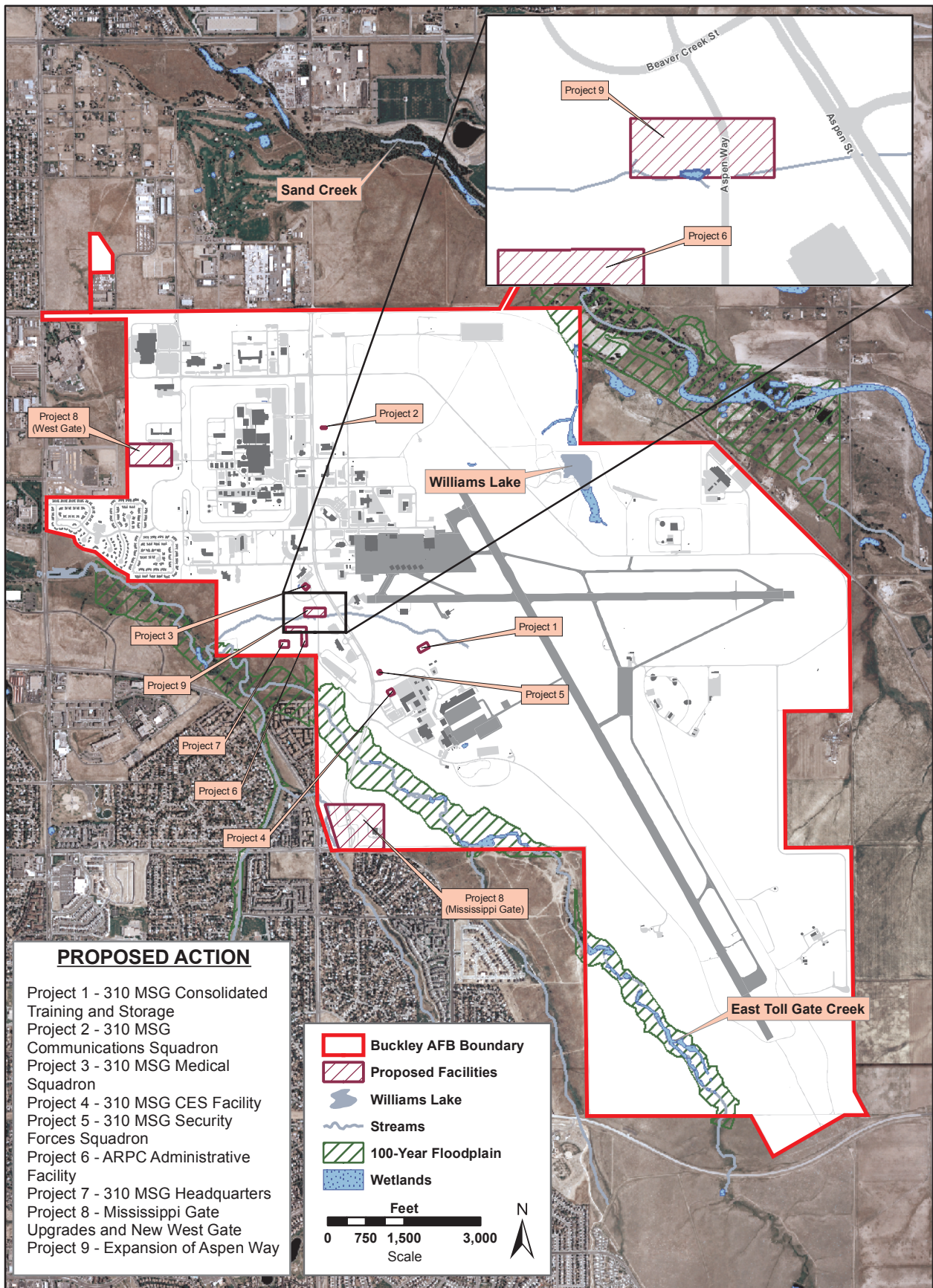
East Toll Gate Creek, an intermittent stream within the Toll Gate Creek Watershed, is in the western section of the base. This watershed has a drainage area of 40.5 square miles (mi²) (25,878 acres) in Aurora, Colorado. Toll Gate Creek Watershed is heavily urbanized. Two-thirds of the surface land area within the watershed has already been developed, and only 6 percent of the land is available for future development (Aurora 2006b). East Toll Gate Creek subwatershed contains a total drainage area of approximately 11 mi² (7,074 acres).

Wetlands. A total of 23 wetlands have been identified on Buckley AFB. Of these 23 wetlands, only one is in the vicinity of the proposed projects under the Proposed Action and is the wetland just south of Beaver Creek Street and west of Aspen Way (see **Figure 3-4**). See **Sections 3.6** and **4.6** for a detailed discussion on wetlands.

3.6 Biological Resources

Biological resources include native or naturalized plants and animals, and the habitats, such as forests and grasslands, in which they exist. This section describes the affected environment for vegetation; wetlands; native and nonnative wildlife; and threatened, endangered, and other sensitive species known or likely to occur at Buckley AFB. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or a state.

Biological resources also include wetlands, which 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, providing wildlife habitat, supporting unique and niche flora and fauna, 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 U.S. Army Corps of Engineers (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 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 328). EO 11990, *Protection of Wetlands*, directs Federal agencies to avoid destruction or modification of wetlands whenever there is a practicable alternative.



Source of Surface Water Features: BAFB 2006a, BAFB 2006b

Figure 3-4. Proposed Action Locations in Relation to Surface Water Resources at Buckley AFB

This analysis is based on a site visit conducted in November 2006, previous surveys at Buckley AFB, and literature searches.

Vegetation. Buckley AFB is in the Great Plains-Palouse Dry Steppe Province Ecoregion (Bailey 1995), an ecoregion also classified as shortgrass prairie (BAFB 2004). The Preliminary Draft Integrated Natural Resources Management Plan (BAFB 2004) identifies ten vegetation types occurring within the shortgrass ecosystem represented on Buckley AFB. Of those ten, only three are mapped or observed at the Proposed Action sites as follows (see **Figure 3-5**):

- Crested wheatgrass
- Midgrass Prairie
- Bottomland Meadow.

Areas dominated by crested wheatgrass (*Agropyron cristatum*), a nonnative grass species historically used to revegetate disturbed ground, occur throughout the base. Some of these areas contain primarily crested wheatgrass and very little other native species. Other areas contain a more even distribution of crested wheatgrass, blue grama, western wheatgrass, and associated species. Nearly 50 percent of the base consists of crested wheatgrass vegetation.

Midgrass prairie is dominated by native grass species such as blue grama (*Bouteloua* sp.), western wheatgrass (*Agropyron smithii*), and buffalo grass (*Buchloe dactyloides*). Other common grasses include tumble grass (*Schedonnardus paniculatus*) and three-awns (*Aristida fendleriana* and *A. longiseta*). Fringed brome grass (*Bromus ciliatus*) dominates depressions and gullies within the midgrass prairie.

Herbaceous species associated with midgrass prairie are scarlet globe mallow (*Sphaeralcea coccinea*), prickly pear (*Opuntia macrorhiza*), rabbitbrush (*Chrysothamnus nauseosus*), and snakeweed (*Gutierrezia sarothrae*).

Bottomland meadows occur within the mixed grass prairie and can support wetlands. Fringed brome grass dominates the bottomland meadows and is generally associated with moist soil conditions (BAFB 2004). Plains cottonwood (*Populus deltoides*)/willow (*Salix* sp.) communities dominate bottomland meadows.

A variety of shelterbelts were planted around the base during the 1990s. These shelterbelts range from single-row to five-row plantings of American plum, Ponderosa pine, or Rocky Mountain juniper, and provide screening, living snow fencing, wind breaks, dust collection, and wildlife habitat. Shelterbelts close to Project Nos. 6, 8 (West Gate), and 9 are five-row shelterbelts, approximately 75 feet wide, that were planted in 1995 (West Gate) and 1998 (Projects 6 and 9).

The Proposed Action site for Project No. 3 is within Buckley AFB existing facilities. The Proposed Action sites for Projects Nos. 1, 2, 4, 5, 6, and 7; and the New West Gate portion of Project No. 8 are all mapped as crested wheatgrass vegetation type areas. The expansion of Aspen Way under Project No. 9 is mapped as both crested wheatgrass and bottomland meadow. The Proposed Action site for the improvements to the Mississippi Gate portion of Project No. 8 is mapped as midgrass prairie. Most of the Proposed Action sites have potential to have been impacted by previous construction (particularly Project No. 4 which is in close proximity to the Civil Engineer Complex and Joint Army/Air Guard Building) resulting in the presence of weeds. Segments of the Proposed Action site for the expansion of Aspen Way under Project No. 9 (strips on either side of the unnamed drainage that empties into East Toll Gate Creek) would include areas mapped as containing various species of thistle.

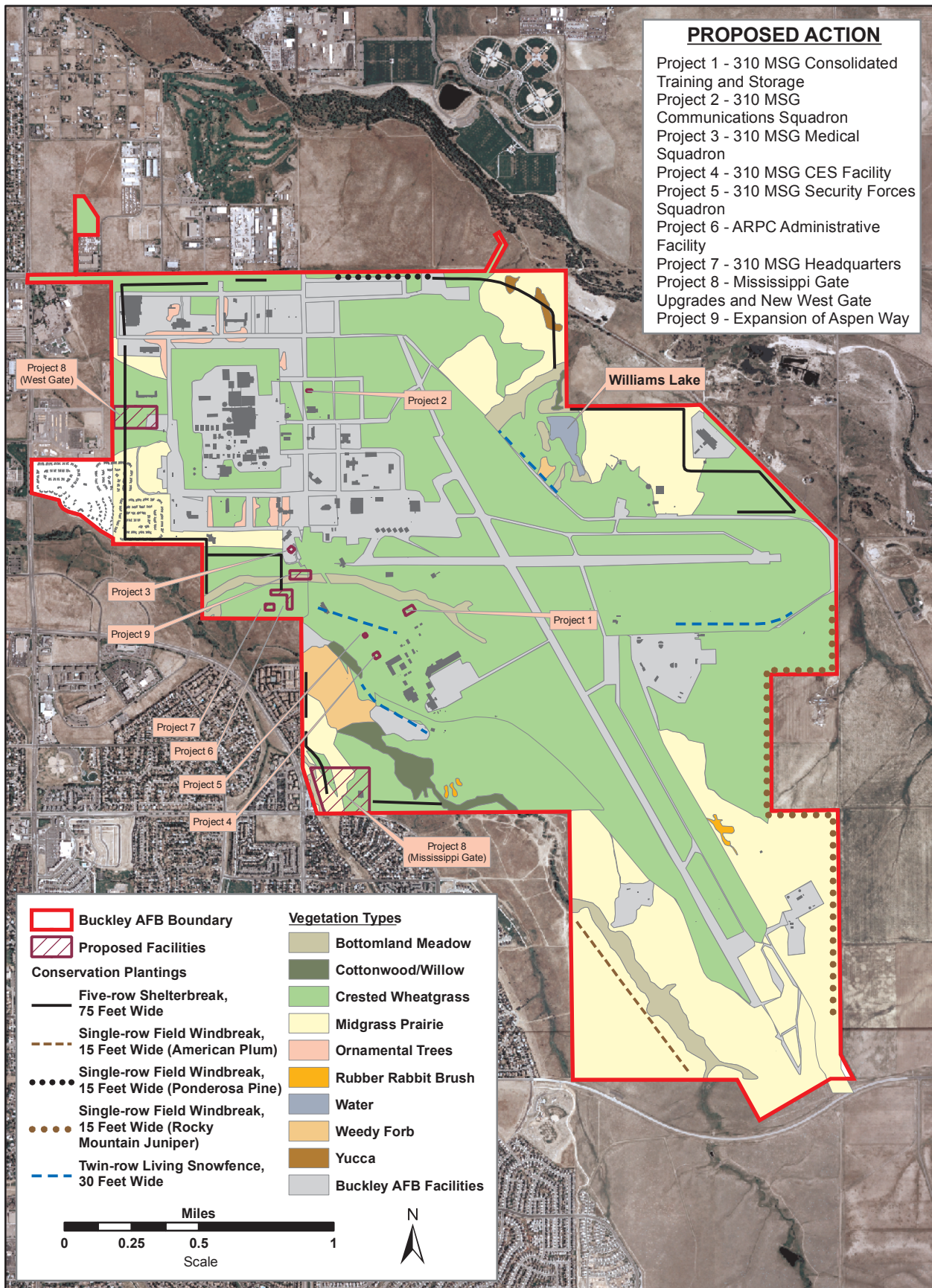


Figure 3-5. Proposed Action Locations in Relation to Vegetation Types and Conservation Plantings at Buckley AFB

Wetlands. The filling of wetlands and waters of the United States is regulated under the CWA. A total of 23 wetlands were identified during a 2001 survey (BAFB 2004). Of the 23 wetlands on Buckley AFB, one wetland near Projects Nos. 6, 7, and 9 (the expansion and realignment of Aspen Way) is susceptible to impacts from construction. Expansion of Aspen Way under Project No. 9 crosses the drainage feeding this wetland and could infringe upon the wetland itself (see **Figure 3-4**). Projects Nos. 6 and 7 are in a sensitive drainage area and are approximately 200 feet away from the affected wetland. This wetland is not named, and occurs along an intermittent stream that drains from the base to East Toll Gate Creek. The wetland is classified under the Cowardin system (Cowardin et al. 1979) as Palustrine Emergent Non-Persistent (PEM2) and was identified as nonjurisdictional and is not subject to the 404 permitting process (BAFB 2004, DOD 2007).

Wildlife. This section describes the wildlife species and their habitat associations at Buckley AFB. No open-water aquatic habitat occurs within the Proposed Action; therefore, animals associated with such water sources are not included in this analysis. A discussion of birds is contained in the Migratory Birds section under Threatened, Endangered, and Other Sensitive Species.

Mammals. Although the perimeter fence excludes pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*) are occasionally observed within the base boundary. 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*). Small mammals observed at Buckley AFB include rodents and lagomorphs (rabbits and hares). The most widely observed of the rodents is the black-tailed prairie dog (*Cynomys ludovicianus*). Prairie dogs are considered a keystone species of the shortgrass prairie ecosystem 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 townsendii*), eastern cottontail (*Sylvilagus floridanus*), and desert cottontail (*Sylvilagus auduboni*).

Reptiles and Amphibians. Plains spadefoot toad (*Spea [Scaphiopus] bombifrons*) and Great Plains toads (*Bufo cognatus*) occupy grassland habitat along riparian floodplains and can occur on Buckley AFB (BAFB 2004). Bullfrog (*Rana catesbeiana*) and northern leopard frog (*Rana pipiens*) have been observed on the base but are generally found near a permanent water source, which does not occur in the vicinity of the Proposed Action sites. A variety of reptile species inhabit Buckley AFB; some of the more commonly observed species include northern prairie lizard (*Sceloporus undulatus garmani*), bullsnake (*Pituophis catenifer*), western hog-nosed snake (*Heterodon nasicus*), plains garter snake (*Thamnophis radix*), and prairie rattlesnake (*Crotalus viridis*) (BAFB 2004).

Threatened, Endangered, and Other Sensitive Species.

Threatened or endangered plant and animal species are protected under the Endangered Species Act (ESA) and Colorado state law. 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 Colorado Division of Wildlife (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 threatened and endangered species, as well as CDOW species of concern, are shown in **Table 3-4**. A number of species that lack suitable habitat, are unlikely to occur, or would not be impacted and are not discussed further. These species include black-footed ferret, swift fox,

bald eagle, ferruginous hawk, plains sharp-tailed grouse, loggerhead shrike, northern leopard frog, Utes ladies'-tresses, and Colorado butterfly plant.

Table 3-4. Threatened and Endangered Species and Species of Special Concern

Common Name	Scientific Name	Status		Potential for Occurrence on Sites
		Federal	State	
Mammals				
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	--	SC	Present.
Black-footed ferret	<i>Mustela nigripes</i>	E	E	Not present; Buckley AFB is within Block Clearance Zone in Colorado.
Swift fox	<i>Vulpes velox</i>	--	SC	Unlikely; occurs in native prairie of easternmost Colorado; never observed at Buckley AFB.
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	T	T	Not present; Buckley AFB is within Denver Metropolitan Area Block Clearance Zone.
Birds				
Burrowing owl	<i>Athene cunicularia</i>	--	T	Present; nesting locations in vicinity of proposed action or alternatives.
Ferruginous hawk	<i>Buteo regalis</i>	--	SC	Potentially present; no known nesting locations on Buckley AFB.
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T	Occasional visitor; no known nests or roosts on Buckley AFB.
Loggerhead shrike	<i>Lanius ludovicianus</i>	--	SC	Present as spring/fall migrant but not known to nest on Buckley AFB. No nesting habitat in proximity of proposed or alternative sites.
Plains sharp-tailed grouse	<i>Tympanuchus phasianellus jamesii</i>	--	E	Potentially present; no known nesting locations on Buckley AFB.
Amphibians				
Northern leopard frog	<i>Rana pipiens</i>	--	SC	Potentially present in/near permanent water sources; no such habitat near Proposed Action.
Plant Species				
Colorado butterfly plant	<i>Gaura neomexicana ssp. coloradensis</i>	T	--	Unlikely; survey conducted in 2004 found no occurrences.
Utes ladie's-tresses	<i>Spiranthes diluvialis</i>	T	--	Unlikely; survey conducted in 2001 found no occurrences.

Source: BAFB 2004

Notes:

T = Threatened

E = Endangered

SC = Species of Special Concern in Colorado (CDOW listing)

Black-tailed Prairie Dog. The black-tailed prairie dog was a Candidate for Listing under the ESA in 2000, but was removed from this status in 2004. However, black-tailed prairie dogs are still considered a Species of Special Concern by the CDOW due to their role as a keystone species and their importance to the shortgrass prairie ecosystem. Black-tailed prairie dogs occur in many areas throughout Buckley AFB and inhabit burrows, typically 3 to 6 feet (0.9 to 1.8 meters) deep. Many other species inhabit prairie dog burrows, including burrowing owls, cottontails, other rodents, reptiles, insects, and spiders (BAFB 2004).

Buckley AFB has a Supplement to *Environmental Assessment of Proposed Prairie Dog Management Practices* at Buckley Air Force Base (BAFB 2001) in place to address management of active black-tailed prairie dog colonies. This EA specifies that if a prairie dog colony would be impacted by a proposed action, then prairie dogs would be removed prior to construction using approved removal methods described in the EA, including removal to a raptor, or a black-footed ferret facility, or poisoning.

Surveys indicate that Project site No. 3 contains very low colony densities (7 or fewer prairie dogs per acre). Project sites Nos. 1, 4, and 6–9 contain low colony densities (7 to 14 prairie dogs per acre); and Project sites 2 and 5 do not have established prairie dog colonies at this time (see **Figure 3-6**) (Phillips 2007).

Migratory Birds. Migratory birds are protected by the *Migratory Bird Treaty Act of 1918* (16 U.S.C. 703–712) as amended, and EO 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*. Protected migratory bird species are listed in 50 CFR 10.13, and include nearly all native species occurring in North America. Although detailed avian surveys have not been conducted at Buckley AFB (BAFB 2004), migratory birds documented to occur on Buckley AFB include the horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), black-billed magpie (*Pica pica*), and eastern kingbird (*Tyrannus tyrannus*). A number of other migratory bird species have the potential to occur on the base.

Burrowing owls are listed as threatened in Colorado but also receive Federal protection under the Migratory Bird Treaty Act. Burrowing owls nest in abandoned prairie dog burrows and are generally present on base from early March to late October. Burrowing owls have not historically or recently (i.e., 2006) been observed at seven of the nine Project sites. Project site No. 2 is in the vicinity of two burrowing owl nests identified in 2005, however the 2006 survey did not locate any burrowing owl nests in this area.

The New West Gate component of Project No. 8 is in the vicinity of three burrowing owl nests, indicated on **Figure 3-6**. In addition, it should be noted that burrowing owls establish nests in new locations from year to year and it is possible that they might do so in the Proposed Action project sites in subsequent years (BAFB 2006d). If a nest causes extensive/expensive delays then removal would be considered as a last resort option. Any nest occurring on the outer edge of a project where buffers occur would be allowed to stay in place until after fledging.

In addition to the migratory birds listed, the most common songbirds inhabiting prairie habitats include lark bunting (*Calamospiza melanocorys*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), and western kingbird (*Tyrannus verticalis*). Many of these prairie species nest on the ground and these species, their nests, and eggs are protected by the MBTA. Species more common in urbanized areas include house finch (*Carpodacus mexicanus*), common grackle (*Quiscalus quiscula*), nonnative house sparrow (*Passer domesticus*), rock dove (*Columba livia*; aka pigeon), and European starling (*Sturnus vulgaris*). Raptor species known or likely to occur at Buckley AFB include burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), prairie falcon (*Falco mexicanus*), and American kestrel (*Falco sparverius*). In addition, bald eagle (*Haliaeetus*

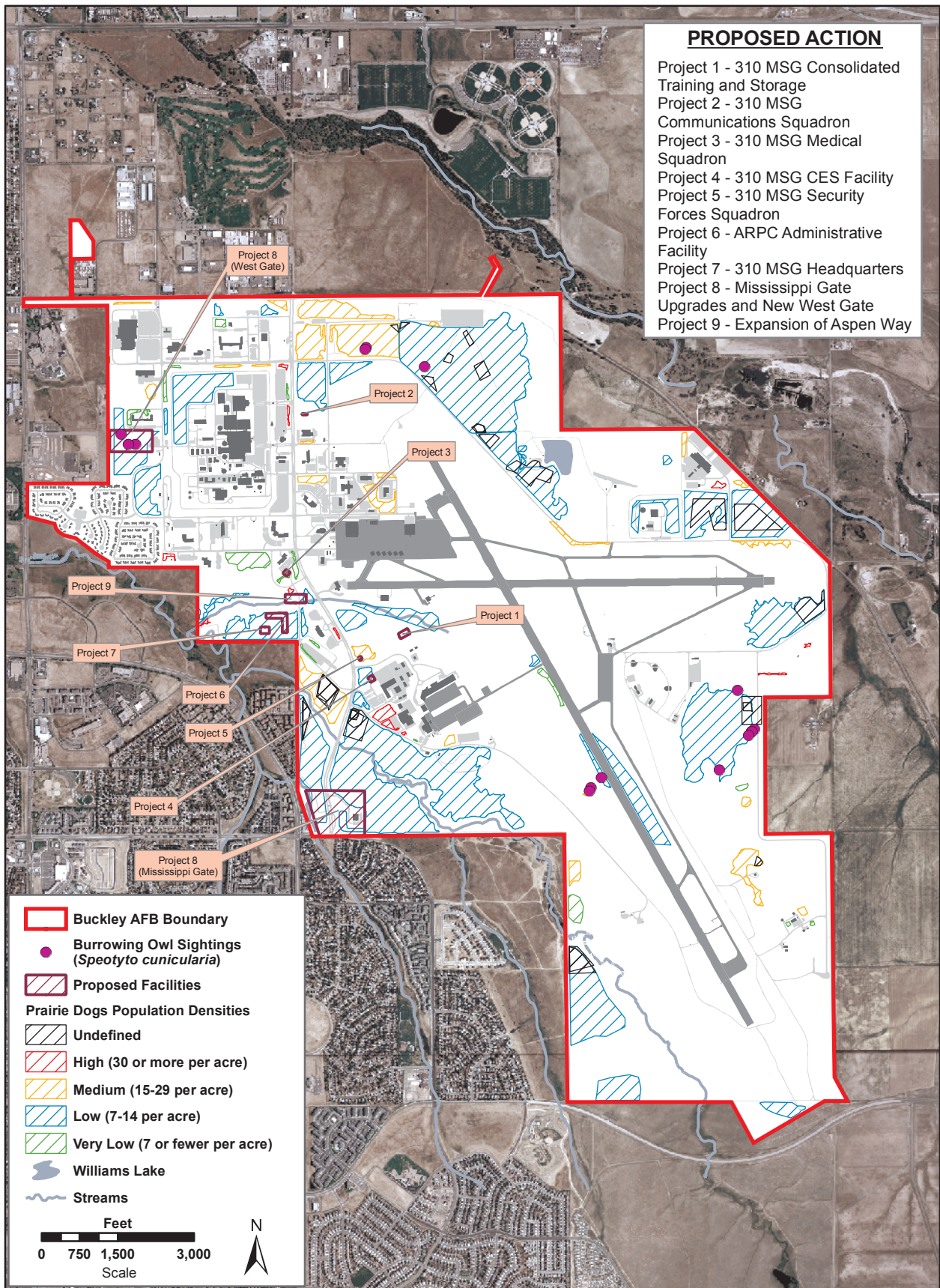


Figure 3-6. Proposed Action Locations in Relation to Potential Locations of Threatened and Endangered Species at Buckley AFB

leucocephalus), ferruginous hawk (*Buteo regalis*), and rough-legged hawk (*Buteo lagopus*) can be observed in winter.

The *Black-tailed Prairie Dog and Burrowing Owl Surveys and Mapping for Buckley Air Force Base, Colorado* (BAFB 2006d) identified a red-tailed hawk nest and a Swainson's hawk nest within the boundary of Buckley AFB. Neither the red-tailed hawk nest nor the Swainson's hawk nest would be affected by the Proposed Action or the No Action Alternative.

3.7 Cultural Resources and Viewshed

Cultural resources is an umbrella term for a variety of heritage or cultural-related resources that are considered under certain Federal laws, regulations, EOs, and other requirements. Cultural resources include historic properties (historic buildings, districts, archaeological sites, or traditional cultural properties included in or eligible for inclusion in the National Register of Historic Places [NRHP]), Indian sacred sites, archaeological resources, Native American human remains or cultural items, or more intangible aspects of the environment.

NEPA and the CEQ regulations require consideration of the impacts of Federal actions on the "human environment." CEQ regulations define the human environment as "the natural and physical (built) environment and the relationship of people with that environment" (40 CFR 1508.14). NEPA considers cultural resources as aspects of the human environment and addresses compliance with those cultural resources requirements. For Buckley AFB, compliance with Section 106 of the NHPA is of primary concern because of its historic properties.

Buckley AFB's Draft Integrated Cultural Resources Management Plan (ICRMP) describes nearly all of Buckley AFB as having been inventoried for buildings, structures, and archaeological sites. Six buildings have been determined by Buckley AFB, with the concurrence of the Colorado State Historic Preservation Office (SHPO), to be individually eligible for the NRHP. All six buildings date to the Cold War era (460 SW 2006). They are as follows:

- Building 801 (5AH.2274): double-bay, arched concrete hangar built for the Navy in 1953; eligible for inclusion in the NRHP for its Cold War history and architectural significance as an unusual type of Navy hangar
- Building 909 (5AH.2276): steel-truss, low-gable hangar built in 1956 for the COANG's jet aircraft and the Air National Guard's (ANG) only precision-flying team, the Minute Men; eligible for inclusion in the NRHP for its Cold War-era history
- Buildings 402 (5AH.2322), 403 (5AH.2288), 404 (5AH.2289), and 405 (5AH.2333): satellite communications ground terminals (radomes) (exteriors only) constructed 1970 to 1976; eligible for inclusion in the NRHP for architectural significance as excellent examples of radome construction and for their contributions to Cold War-era history.

There are no archaeological sites eligible for inclusion in the NRHP at Buckley AFB. The entire base has been surveyed for archaeological resources except for approximately 150 acres within the secure area that is highly developed. No Indian sacred sites, traditional cultural properties, Native American human remains, or cultural items have been identified from inventories, inadvertently discovered, or reported at Buckley AFB. Buckley AFB is beginning to initiate tribal consultation. According to the Draft ICRMP, the SHPO has concurred that no additional areas outside the secure area remain to be surveyed for archaeological sites. Analyses of impacts of each alternative to cultural resources (historic properties Buildings 801, 909, and 402 through 405 inclusive) are discussed in terms of both NEPA and NHPA below.

Buckley AFB is visually prominent due to the radomes at the base that appear as giant “golf balls” looming above the Denver-Aurora horizon. The radomes establish Buckley AFB’s identity on Aurora’s plains and urban landscape. The four most prominent radomes, Buildings 402 through 405 inclusive, are historic properties (eligible for inclusion in the NRHP). They stand 85 feet tall and are within the secure area on the more urban western side of the base. The general visual character of Buckley AFB is one of a military base within a developed metropolitan area. Newly constructed buildings at Buckley AFB are attractive and blend with the plains landscape. A residential area has been constructed on the western side of Buckley AFB. The open airfield and protected air use areas in the southern and eastern portions of the base contrast with the developed areas on the northern and western sides of the base.

3.8 Socioeconomic Resources

Buckley AFB occupies approximately 3,283 acres 8 miles east of Denver, Colorado, within the City of Aurora, in Arapahoe County. The city of Denver and Arapahoe County have populations of 557,478 and 487,697, respectively. The populations of Arapahoe County and Denver increased by 24.6 percent and 18.6 percent, respectively, between 1990 and 2000 (latest data available). Between 1990 and 2000, the population of Aurora increased by 24.6 percent. These increases in population are lower than the statewide increase of 30.6 percent, but nearly double the national increase of 13.1 percent (Census Bureau 2000). The base supports 7,130 uniformed personnel and 5,996 civilians. In addition, the base serves approximately 17,825 dependents and 77,000 Air Force retirees (BAFB 2007a).

Employment Characteristics. As would be expected, a larger portion of residents in the ROI are in the Armed Services than in Arapahoe County or Colorado. A larger percentage of residents in the ROI are employed in retail trade than county or statewide averages. Lower percentages are employed in arts, entertainment, recreation, accommodation, agriculture, forestry, fishing and hunting, and mining in comparison to county and statewide averages (Census Bureau 2000).

The presence of Buckley AFB has had a positive economic impact on the Denver Metropolitan Statistical Area (MSA). In 2006 Buckley AFB generated an annual payroll of \$620 million, of which \$240 million was for military payroll; \$168 million for civilian payroll; and \$211 million for nonappropriated funds, contract civilians, and private businesses. The total annual base impact from expenditures, services, and procurement of materials from Buckley AFB was just more than \$1 billion in 2006 (BAFB 2007a).

As of January 2007, the Denver MSA had an unemployment rate of 4.7 percent and the state of Colorado had an unemployment rate of 4.1 percent (BLS 2007). The total labor force of Denver MSA in April 2007 was 1,351,900 and the Gross Domestic Product was approximately \$198 billion in 2006 (Colorado Workforce 2007, BEA 2007). **Table 3-5** includes population and poverty characteristics of the ROI, Arapahoe County, and Colorado.

For the purposes of this EA, the ROI is defined as census tract 71.02 (which contains Buckley AFB) and census tracts 70.08, 70.33, 70.43, and 70.65 surrounding Buckley AFB. These census tracts contain the area that could be affected under the Proposed Action and alternatives.

Colorado and Arapahoe County. According to U.S. Census Bureau 2000 information, the percentage of residents in the ROI who live below the poverty level (6.3 percent) is comparable to the statewide average (6.2 percent), but higher than the county average (4.2 percent). The per capita incomes and median household incomes of persons in the ROI (\$20,817 and \$46,467 respectively) are lower than both Colorado’s (\$24,049 and \$47,203) and Arapahoe County’s (\$24,049 and \$47,203).

Table 3-5. Population and Poverty Characteristics

	ROI ^b	Arapahoe County	Colorado
Total Population	25,308	487,967	4,301,261
Percent below poverty ^a	6.3	4.2	6.2
Per Capita Income ^a	\$20,817	\$28,147	\$24,049
Median Household Income ^a	\$46,467	\$53,370	\$47,203

Source: Census Bureau 2000

Note:

^a Census 2000 data are the most recent comprehensive employment data for the ROI.

^b The percent of persons below poverty level in the ROI is the average of the five census tracts evaluated.

3.9 Utilities

Utilities refer to the systems and physical structures to support a population and include potable water, electric power, natural gas, communications, municipal solid waste (MSW) management, and wastewater treatment. **Section 3.10** of this EA addresses transportation/traffic.

Public providers supply water, gas, and electrical power to Buckley AFB. Since 2001 Buckley AFB has been proactive in increasing the capacity of its utility systems as a result of the establishment of the Air Force Space Command (AFSPC) at the base. There have been and continue to be numerous upgrades performed on many of the utilities. Upgrades to utilities will be performed in four phases; the most current being Phase III, which consists of upgrades to the base's natural gas distribution system, electrical distribution systems, water and wastewater systems, and roadway and circulation system (BAFB 2003a).

Electrical System and Natural Gas. Buckley AFB receives electrical power and natural gas from Xcel Energy (BAFB 2005a). In CY 2006, Buckley AFB consumed approximately 127 million kilowatt hours (KWh) of electricity and 1.5 million cubic feet of natural gas.

Water Systems. Potable water is provided by the City of Aurora directly to Buckley AFB facilities without supplementary treatment (BAFB 2005a). There are no contractual limits on the amount of water the base may use. In FY 2006, approximately 128,645,000 gallons of water were consumed by Buckley AFB, or roughly 352,000 gallons per day (based upon 365 days); this number includes consumption by all sources, (i.e., personnel consumption, operations, maintenance, and irrigation). According to the General Plan, daily water consumption capacity is approximately 351,000 gallons per day. Therefore, the base is currently beyond its capacity. However, the General Plan was written prior to the completion of the infrastructure upgrades outlined in the *Environmental Assessment for Phase III Upgrade and Expansion at Buckley AFB*, therefore it is uncertain what Buckley AFB's utilities capacities are.

Wastewater from Buckley AFB includes domestic and industrial. Industrial wastewater consists of water from oil/water separators. Much of the sewer system was installed in the 1940s and 1950s and is composed of vitrified clay pipe. The more recently installed sections of sewer main are polyvinyl chloride (PVC) pipe, which is now used for all sewer upgrades on the base. Wastewater discharge is regulated under a Wastewater Contribution Permit issued by the Metro Wastewater Reclamation District. In CY 2006 Buckley AFB wastewater totaled 80,329,000 gallons. The daily wastewater discharge capacity is almost 300,000 gallons per day (BAFB 2005a). The Metro Wastewater Reclamation District treatment plant has a capacity of 185 million gallons per day (BAFB 2006f).

Storm Water. Storm water flows, which can be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to management of surface water. Storm water is also important to surface water quality because of the potential to introduce sediments and other contaminants into lakes, rivers, and streams. Storm water systems convey precipitation away from developed sites to appropriate receiving surface waters. For several reasons, storm water systems can employ a variety of devices to slow the movement of water. For instance, a large, sudden flow could scour a streambed and harm biological resources in that habitat. Storm water systems provide the benefit of reducing amounts of sediments and other contaminants that would otherwise flow directly into surface waters. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event will often lead to downstream flooding and the environmental and economic damages associated with flooding. As a general rule, areas with higher densities of development, such as urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur in urban centers.

On Buckley AFB, storm water regulations are under the purview of USEPA, the agency responsible for regulatory enforcement on Federal facilities in the state of Colorado. USEPA's storm water regulations consist of three permit programs.

The General Permit for Storm Water Discharges from Construction Activities (Construction General Permit [CGP]) Program has the objective of preventing pollutants on construction sites (e.g., sediment and petroleum, oil, and lubricants [POLs]) from being transported offsite by storm water runoff. 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 (NOI) 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. In addition to applying for an NOI, the CGP requires each project to develop and implement an SWPPP. The SWPPP includes BMPs for erosion and sediment control, control of waste at the site, self-inspection/monitoring, and reporting efforts.

The General Permit for Storm Water Discharges from Federal Facility Small MS4 in the Colorado Program provides an overall management and compliance program for the owners and operators of storm water conveyance systems. Requirements of the MS4 program include preparation and implementation of an SWMP. The SWMP identifies BMPs that address each of six minimum control measures, which include construction site storm water runoff control and post-construction storm water management in new development/redevelopment.

Buckley AFB holds active permits under two of these USEPA storm water programs. In addition to the USEPA permit program requirements, the USAF complies with Engineering Technical Letter (ETL) 03-1: *Storm Water Construction Standards*.

Solid Waste. A private contractor manages solid waste collection and disposal services at Buckley AFB. Waste is collected from dumpsters throughout the base and routinely transported to an approved Denver Arapahoe Disposal Site in Arapahoe County. This Disposal Site is owned by the City and County of Denver, but is operated under long-term contract by Waste Management. The permitted portion of the landfill occupies 2,680 acres with an estimated design life of 40 to 50 years. The landfill receives approximately 2.3 million tons of solid waste per year. Buckley AFB generated approximately 2,849 tons of nonhazardous solid waste in FY 2006, with 1,202 tons of this being solid waste landfill disposed, 23 tons of solid waste to energy incineration, and 1,624 construction and demolition derived wastes. This value equals 0.07 percent of the total waste received by the Denver-Arapahoe Disposal Site landfill (City of Denver undated).

3.10 Transportation/Traffic

The ROI for transportation/traffic is all on-base parking areas and roadways within Buckley AFB, and major off-base corridors near access points, including 6th Avenue, Mississippi Avenue, Airport Boulevard, and State Highway 30. This section identifies the existing transportation network and conditions in the vicinity of the project area. Buckley AFB is in the Denver Metropolitan Area, along the Front Range of the Rocky Mountains. Major vehicle routes traverse through Denver including I-70, I-25, and I-76. Branching off I-70 to the west of the base is I-225, which runs north-south through the City of Aurora. Intersecting with I-225 in the City of 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 Main and Mississippi Gates. In addition, E470 Toll Highway provides an alternative beltway route around the eastern half of the Denver Metropolitan Area, and is to the east of Buckley AFB. E470 extends in a north-south direction in the vicinity of Buckley AFB, and is approximately 0.75 miles from the eastern boundary of the base (BAFB 2006e).

Alternative Transportation Systems. The RTD bus system provides daily service from the BX and Commissary to various locations throughout the Denver Metropolitan Area. There are currently no Light Rail Transit (LRT) systems that service the project areas. The proposed future expansion of the LRT 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 base. One would be approximately 4 miles from the Entry Gates at 40th and Peña Boulevard, and the other would be at the Aurora City Center approximately 3 miles west of the Mississippi Gate (BAFB 2006e).

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 project areas. There are a few pedestrian trails for employees or residents of Buckley AFB to use. An existing off-base 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 2006e).

Installation Traffic. Traffic on the base 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 base are classified as tertiary streets serving individual areas on the base. Vehicular traffic accesses the base through three entry control points: the Main, Telluride, and Mississippi Gates (BAFB 2006e).

Main and Telluride Gates. Buckley AFB currently has 3 gates; Main, Telluride, and Mississippi. The Main Gate is to the south of a primary artery, 6th Avenue, which runs adjacent to the northern boundary of the base. The Main Gate is open 24 hours per day and provides access to Aspen Street on-base. The Main Gate sees approximately 655 peak morning hour (between 6:30 and 7:30 a.m.) inbound vehicles. The new Telluride Gate is also to the south of 6th Avenue, west of the Main Gate, and is currently operated between 6:00 a.m. and 6:00 p.m. Monday through Friday and is closed on weekends (hours are subject to change). Since the Telluride Gate was recently completed no inbound vehicle data are available, but 200 to 250 peak morning hour inbound vehicles were estimated. The Telluride Gate provides access to Telluride Street on-base, and is designed primarily as a limited use gate for accessing the BX and Commissary. Traffic volumes at the Main Gate might have decreased in the recent past, due to the opening of the Telluride Gate (BAFB 2006e).

West of the Main and Telluride Gates, 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 E470 accesses 6th Avenue and the south side of the base using the Jewell Avenue. Current traffic flow entering and exiting E470 at Jewell Avenue averages 300 vehicles per day. East of the gates 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 E470 (BAFB 2006e).

At the Main Gate, 6th Avenue intersects with Aspen Street, the most heavily traveled road on-base. Aspen Street has average daily traffic of approximately 4,000 vehicles per day in the central base area.

Mississippi Gate. The Mississippi Gate is to the north of Mississippi Avenue, which runs adjacent to the southern boundary of the base. This gate provides access to Aspen Street at the southern boundary of the base and is open from 6:00 a.m. to 7:00 p.m. Monday through Friday, and 8:30 a.m. to 6:30 p.m. on weekends. Approximately 780 peak morning hour inbound vehicles pass through the Mississippi Gate. Results of a study performed at the Mississippi Gate March 8 through 11, 2004, revealed that the daily average number of vehicles entering the base through the Mississippi Gate is 3,000. The Mississippi Gate receives all commercial vehicles (e.g., construction vehicles and delivery trucks). 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.

3.11 Hazardous Materials and Wastes

Hazardous Materials. Hazardous substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, or incapacitating reversible illness; or pose a substantial threat to human health or the environment. AFI 32-7086, *Hazardous Materials Management* also includes medical supply items, but excludes drugs and pharmaceuticals, and munitions (USAF 2004).

Evaluation of hazardous materials (HAZMATs) and wastes focuses on underground storage tanks (USTs) and aboveground storage tanks (ASTs) and the storage, transport, and use of pesticides and herbicides; fuels; and POL. Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of HAZMATs and wastes can threaten the health and well being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of HAZMATs or wastes, the extent of contamination varies based on the type of soil, topography, and water resources.

Special hazards are those substances that might pose a risk to human health, but are not regulated as contaminants under the hazardous waste statutes. Included in this category are ACM, LBP, radon, polychlorinated biphenyls (PCBs), and UXO. The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action. In conformance with the policies established by AFD 32-70, *Environmental Quality*, the 460 CES/CEV has developed plans to manage HAZMATs, hazardous wastes, and special hazards on the base.

AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of HAZMATs throughout the USAF. It applies to all USAF personnel and contractors, who authorize, procure, issue, use, or dispose of HAZMATs; and to those who manage, monitor, or track any of those activities. Included in AFI 32-7086 are guidelines and goals for establishing a standardized system by which HAZMAT is tracked and accounted for in the USAF. This is accomplished in the form of the Hazardous Materials Pharmacy, or HAZMART. The HAZMART at most USAF bases is the central location for the receipt, storage, issue, inspection, and distribution of HAZMAT. However, Buckley AFB implements a “virtual” HAZMART, which does not have a central location but rather

electronically tracks and controls use. In general, the majority of HAZMAT used on base is at areas where maintenance is performed on vehicles and aircraft; similarly, these areas also generate the majority of hazardous wastes (USAF 2004).

HAZMATs used during construction include solvents, sealants, adhesives, and welding gases; and POL to operate equipment. Generally, the majority of construction practices do not involve the use of large quantities or many different types of HAZMATs. Additionally, the USAF adheres to sustainable or “green” building practices which inherently use fewer HAZMAT. In accordance with AFI 32-7086, the use of HAZMAT by contractors must be authorized prior to their use by the HAZMART. Procedures for gaining HAZMAT authorization for contractors can be found in the above-mentioned AFI, and in Sections 2.5.3 and 2.5.5.2 of AFI 32-7086. As part of the authorization process, the HAZMART determines if there is a similar material which is less hazardous (USAF 2004).

Hazardous Wastes. Hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that pose a substantial present or potential hazard to human health or the environment. In general, both HAZMATs and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed.

The 460th Environmental Flight maintains a *Hazardous Waste Management Plan* (HWMP) as directed by AFI 32-7042, *Solid and Hazardous Waste Compliance*. This plan prescribes the roles and responsibilities of all members of Buckley AFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable Federal, state, and local standards for solid and hazardous waste management (USAF 1994b).

Wastes generated at Buckley AFB include pesticides, herbicides, POL, deicing fluids, flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, waste oils, waste paint-related materials, MSW, and other miscellaneous wastes. Management of hazardous wastes is the responsibility of each waste-generating organization and the 460 CES/CEV. Hazardous waste is stored at an initial accumulation point (IAP), also known as a satellite accumulation point or SAP, which is at or near the point of generation and under the control of the owner/manager of the generating activity. An IAP is designed to facilitate collection of hazardous wastes and ensure proper management. An IAP is allowed to accumulate up to 55 gallons of hazardous waste or 1 quart of acute hazardous waste. Once the 55 gallons (or 1 quart in the case of acute hazardous waste) limit is reached, the generating activity must transfer the hazardous waste container to the centralized accumulation site (CAS) where wastes from several IAPs are placed for periods of up to 180 days pending disposal or further transfer.

Buckley AFB is characterized as a small quantity generator (SQG) of hazardous waste. As an SQG, Buckley AFB may generate more than 100 kilograms (220 pounds) but less than 1,000 kilograms (2,200 pounds) per month and accumulate the hazardous waste onsite for 180 days without a permit; the quantity of waste cannot exceed 6,000 kilograms (13,200 pounds)

Each organization has appointed a primary and alternate manager for each hazardous waste site on Buckley AFB. Hazardous waste generators are required to maintain a listing of all the hazardous waste streams generated in their section, with proper identification, handling, storage, and record keeping. For special projects generators must coordinate with 460 CES/CEV to obtain containers, and to ensure they meet U.S. Department of Transportation (USDOT) standards, compatibility, and air emissions standards.

Also, contractors must do the following:

- Obtain 460 CES/CEV approval for all HAZMAT used and hazardous wastes generated on the base
- Ensure hazardous wastes are managed per 40 CFR and transported in accordance with 49 CFR to a certified disposal facility
- Ensure proper labeling, handling, segregation, collection, and storage of hazardous waste
- Ensure all personnel are properly trained for handling the hazardous waste they generate
- Ensure the 460 CES/CEV is given notice when scheduling waste disposal requiring a manifest(s), before it is transported off base.

Storage Tanks. AFI 32-7044, *Storage Tank Compliance*, provides guidelines for environmental and engineering requirements for ASTs and USTs. Additionally, 7 Colorado Code of Regulations 1101-14, *Underground Storage Tanks and Aboveground Storage Tanks*, provides guidelines for storage tank installation, maintenance, release response, inspection, and the like (USAF 1994c). There are no ASTs or USTs at any of the sites proposed for construction. Temporary use of storage tanks for fuels might be necessary for fueling of construction equipment. Contractors would be required to coordinate with the 460 CES/CEV Air and Tanks program manager to ensure that all requirements are met. Contractors would be required to follow the Buckley AFB Spill Prevention Control and Countermeasures (SPCC) Plan and develop a site-specific SPCC Plan; which could be required if they use or store 55 gallons or more of POL.

Similarly, any new ASTs or USTs required by the Proposed Action once operational would be coordinated with 460 CES/CEV Air and Tanks program manager. Typically, these tanks would be used for fuel storage for emergency power generation; therefore, they would not have a large capacity. In accordance with 40 CFR 112.5, revisions to the SPCC Plan would be required if any new tanks greater than 55 gallons are to be constructed (BAFB 2006e). New tanks having a volume greater than 660 and less than 39,999 gallons would be required to be registered with the state regulators. A new consolidated fuels storage area is planned under Military Construction (MILCON) for FY 2007; it will be built adjacent to Project 1 of the Proposed Action.

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act, Pollution Prevention Act of 1990 (USAF 1994d). In accordance with EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, the USAF uses recycled-content products where possible including construction materials, and implements other sustainable practices for energy efficiency, water conservation, the reduction or elimination of acquisition and use of toxic or hazardous chemicals, and air and water pollutant reduction. To fulfill this requirement, Buckley AFB has the following plans:

- Draft HWMP
- Draft Solid Waste Management Plan
- Draft SPCC Plan
- The Draft Final Green Procurement Program Plan.

These plans assist in maintaining a waste-reduction program and meeting the requirements of the Clean Water Act (CWA); the NPDES permit program; and Federal, state, and local requirements for SPCC. Coordination with the 460 CES/CEV Green Procurement Program Manager would be needed for requirements as well.

Environmental Restoration Program/Military Munitions Response Program. DOD has developed the Environmental Restoration Program (ERP) intended to facilitate thorough investigation and cleanup of contaminated sites on military installations. Through ERP, each DOD installation must identify, investigate, evaluate, and cleanup sites where hazardous wastes have been spilled, released, or disposed of to the environment. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of contaminants, minimize potential hazards to human health and the environment, and clean up contamination. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed). These plans and programs, in addition to established legislation (e.g., CERCLA and RCRA), effectively form the “safety net” intended to protect the ecosystems on which most living organisms depend. Project No. 9 is near the Apron Runoff Area of Concern (AOC) and the closed ERP Site 6. An investigation for hydrazine has been recommended for the soil and groundwater to evaluate the Apron Runoff AOC.

In the past, the ERP did not directly address concerns from munitions. In 2001, the MMRP was established to manage the environmental, health, and safety issues presented by UXO, demilitarized munitions, and munitions constituents. MMRP Munitions Response Areas include the Former Skeet Range and the Chemical Warfare Area. **Figure 3-7** presents ERP sites in relation to the Proposed Action. However Site 11, which would not be impacted by the Proposed Action, is not included on **Figure 3-7** due to unavailable GIS data at this time.

The Former Skeet Range was in operation during World War II and lasted for an unknown length of time (460 SW AFSPC 2007). There remains a portion of the former skeet range which is to be further evaluated under the MMRP (460 SW AFSPC 2007). Typical concerns for skeet ranges include polycyclic aromatic hydrocarbons (PAHs) and lead. The Former Skeet Range is adjacent to Projects 6 and 9. The Chemical Warfare Training Area is directly within the footprint of the New West Gate of Project 8. Diluted chemical agents were used during training. The improper disposal of canisters or vials containing chemical agents from training events means that there remains a possibility that canisters or vials are present (460 SW AFSPC 2007). Concerns at these sites are addressed under the MMRP.

The MMRP completed a Comprehensive Site Evaluation (CSE), Phase I in 2007, that determined that further study was needed. An ongoing CSE Phase II is addressing the results and recommendations made during Phase I. The results of the CSE Phase II will determine what action (e.g., remediation), if necessary, would be required at each site.

Ordnance. There would be a slight increase in ordnance, or munitions, resulting from the Proposed Action. Work performed by new personnel from the Proposed Action would be primarily administrative, training (mostly classroom), and maintenance of new aircraft; however, there would be an increase of personnel to the security forces squadron. Weapons or small arms used by the 460th Security Forces Squadron (460 SFS) could consist of the M-4 carbine, M-16 rifle, 9-millimeter handgun, and shotgun.

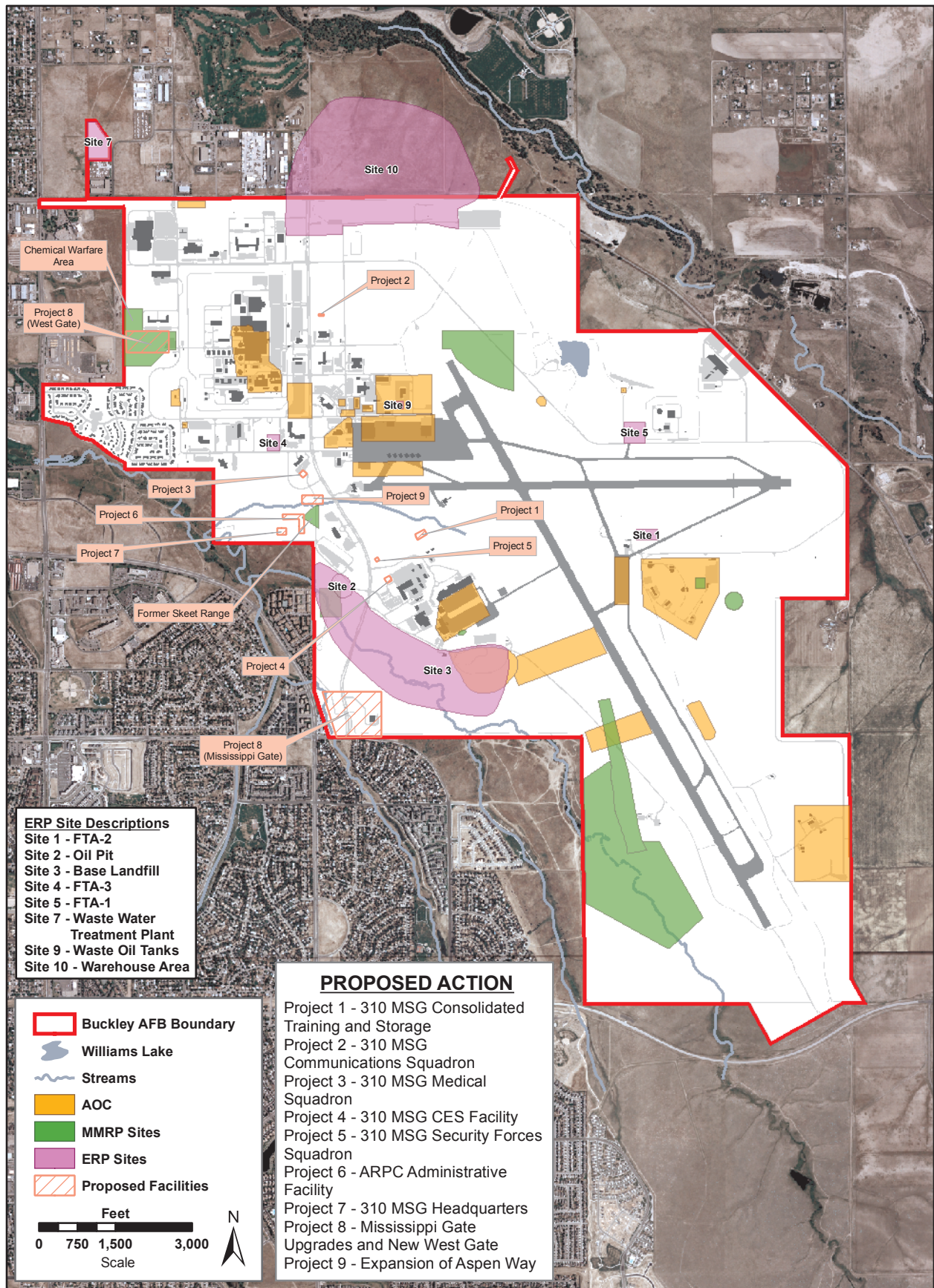


Figure 3-7. Proposed Action Locations in Relation to ERP Sites at Buckley AFB

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4. ENVIRONMENTAL CONSEQUENCES

This section describes the current conditions for and anticipated potential effects on those resources that might be impacted by the Proposed Action, including noise, land use, air quality, geological resources, water resources, biological resources, cultural resources and viewshed, socioeconomic, utilities, transportation/traffic, and hazardous materials and wastes (including the ERP). The definitions for impact intensity thresholds for this document are as follows:

- **Negligible.** Effects on the resource, although anticipated, could be difficult to observe and are not measurable
- **Minor.** Effects on the resource would be detectable upon close scrutiny or would result in small but measurable changes to the resource
- **Moderate.** Effects on the resource would be easily observed and measurable, but would be localized or short-term
- **Major.** Effects on the resource would be easily observed and measurable, widespread, and long-term.

The definitions for duration of effects used in this document are as follows:

- **Short-term.** Effects are not anticipated to last for more than 1 to 2 years
- **Long-term.** Effects are anticipated to last for more than 2 years.

4.1 Noise

Noise impact analyses evaluate potential changes to existing noise environments that would result from implementation of a proposed action. Noise effects might result from construction activities and operations. Projected compatibility issues were measured both qualitatively and quantitatively. Effects related to noise were assessed by evaluating the following:

- Change in existing ambient sound levels caused by the Proposed Action or alternatives
- Whether the Proposed Action or alternatives would lead to a violation of state or local noise ordinances, limits, or standards, or applicable land use compatibility guidelines.

4.1.1 No Action Alternative

Impacts

There would be no impacts on noise under the No Action Alternative because the proposed facilities, infrastructure upgrades, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on noise would result from the implementation of the No Action Alternative.

4.1.2 Alternative A: Proposed Action

Impacts

Sources of noise at Buckley AFB which could impact populations under the Proposed Action include aircraft noise, noise from vehicular traffic, and construction noise.

Aircraft Noise. Under the Proposed Action, no impacts are anticipated based on the increase in F-16 aircraft. As presented in **Table 2-2**, while the number of F-16 aircraft would increase by 20 percent, the number of sorties and flying hours would not increase. Noise contours for Buckley AFB can be seen in **Figure 3-1**.

Vehicular Noise. Under the Proposed Action, there would be long-term minor adverse noise impacts as a result of the increase in traffic, most notably in the areas around East Alameda Parkway and the proposed West Gate. In addition to the short-term increase in vehicular traffic due to construction activities, the noise environment around Buckley AFB would be impacted by an increase in personnel vehicular traffic. Under the Proposed Action, there would be an increase of approximately 800 personnel. The additional vehicular traffic would utilize current ingress and egress points from Buckley AFB, thereby increasing traffic along those roads. Major access routes into Buckley AFB pass by several residential areas.

Construction Noise. Under the Proposed Action, there would be negligible short-term adverse impacts as a result of the construction activities. Noise from construction activities varies depending on the type of construction being done, the area that the project would occur in, and the distance from the source. The construction projects under the Proposed Action include mainly building activities. To predict how these activities would impact adjacent populations, noise from the probable construction was estimated. For example, as shown on **Table 3-1**, building construction usually involves several pieces of equipment (such as saws and haul trucks) that can be used simultaneously. Under the Proposed Action, cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from building activities at a given distance. Examples of expected construction noise during daytime hours are as follows:

- The closest occupants to the construction of the 310 MSG Consolidated Training and Storage Facility would be in Building 1001. Occupants in this facility would be approximately 525 feet from construction and would experience noise levels of approximately 65 dBA. The closest off-base residents to the construction of the proposed Consolidated Training and Storage Facility would be approximately 2,660 feet southwest of the project site on South Zeno Way. Populations would experience noise levels from construction activities of approximately 51 dBA.
- The closest occupants to the construction of the 310 MSG Communications Squadron Training Building would be in Building 730. Occupants in this facility would be approximately 280 feet from construction and would experience noise levels of approximately 70 dBA. The closest off-base residents to the construction of the proposed Communications Squadron Training Building would be approximately 5,970 feet northwest of the project site on Buckley Way. Populations would experience noise levels from construction activities of approximately 44 dBA.
- The closest occupants to the construction of the 310 MSG Medical Squadron Facility would be in Building 600. Occupants in this facility would be approximately 180 feet from construction and would experience noise levels of approximately 74 dBA. The closest off-base residents to the construction of the proposed Medical Squadron Facility would be approximately 2,290 feet south of the project site on South Zeno Way. Populations would experience noise levels from construction activities of approximately 52 dBA.

- The closest occupants to the construction of the 310 MSG CES Facility would be in Building 1005. Occupants in this facility would be approximately 150 feet from construction and would experience noise levels of approximately 76 dBA. The closest off-base residents to the construction of the proposed CES Facility would be approximately 1,600 feet west of the project site on South Zeno Way. Populations would experience noise levels from construction activities of approximately 55 dBA.
- The closest occupants to the construction of the 310 MSG Security Force Squadron Facility would be in Buildings 805 and 806. Occupants in these facilities would be approximately 200 feet from construction and would experience noise levels of approximately 73 dBA. The closest off-base residents to the construction of the proposed Security Force Squadron Facility would be approximately 2,400 feet southwest of the project site on South Zeno Way. Populations would experience noise levels from construction activities of approximately 52 dBA.
- The closest occupants to the construction of the Administrative Facility would be in Building 1030. Occupants in these facilities would be approximately 600 feet from construction and would experience noise levels of approximately 64 dBA. The closest off-base residents to the construction of the proposed Administrative Facility and 310 MSG Headquarters would be approximately 1,050 feet south of the project site on South Zeno Way. Populations would experience noise levels from construction activities of approximately 59 dBA.
- The closest occupants to the construction of the West Gate Facility would be in Building 1030. Occupants in these facilities would be approximately 600 feet from construction and would experience noise levels of approximately 64 dBA. The closest off-base residents to the construction of the proposed West Gate Facility would be in an office building approximately 650 feet southwest of the project site. Populations would experience noise levels from construction activities of approximately 63 dBA.
- The closest occupants to the construction of the Mississippi Gate Facility would be in Building 1550. Occupants in these facilities would be approximately 500 feet from construction and would experience noise levels of approximately 65 dBA. The closest off-base residents to the proposed lane addition and construction of the covered inspection for Mississippi Gate would be approximately 150 feet southeast of the project site on South Biscay Street. Populations would experience noise levels from grading activities of approximately 82 dBA.

Implementation of the Proposed Action would have temporary effects on the noise environment from the use of heavy equipment during construction activities. However, 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.).

Noise impacts from increased traffic due to construction vehicles using the major access roads would also be temporary in nature. These impacts would be confined to normal working hours and would last only as long as the base was undergoing construction activities. However, major access routes into Buckley AFB pass by several residential areas. It is anticipated that the Proposed Action would have short-term minor adverse noise impacts as a result of the increase in traffic, most notably in the areas around East Alameda Parkway.

Cumulative Impacts

Cumulative impacts were evaluated based on additional projects on- and off -base and potential aircraft changes at Buckley AFB and surrounding airports.

On-Base Noise. No additional aircraft changes are planned at Buckley AFB, therefore it is not anticipated that the current noise impacts from aircraft operations would have any effects on the cumulative on-base noise scenario. The cumulative impacts from construction noise should be minor as it is anticipated that the planned construction, renovation, and demolition projects would be dispersed throughout the base and future planned construction projects (see **Appendix C**) would coincide with planned phases of construction for 2005 BRAC Commission actions and with the proposed CF. It is assumed that the development practices stated in the Base General Plan would continue to be followed. This includes limiting noise-sensitive uses in areas within the noise contours shown on **Figure 3-1**.

Off-Base Noise. No cumulative effects on the surrounding area would be expected outside of the base environs. Any construction changes in the ROI and surrounding areas of Buckley AFB would be short in duration during construction and would not result in a cumulative noise effect. No known aircraft changes are planned for Buckley AFB or surrounding airports (i.e., DIA, Centennial, or Front Range airports).

4.2 Land Use

The evaluation of impacts on land use is based on the degree of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. Land use can remain compatible, become compatible, or become incompatible. Projected compatibility issues were measured both qualitatively and quantitatively. Effects on land use were assessed by evaluating the following:

- Consistency and compliance with existing land use plans (such as the Base General Plan), zoning, or policies
- Alteration of the viability of existing land use
- The degree to which the Proposed Action or alternatives preclude continued use or occupation of an area
- The degree to which the Proposed Action or alternatives conflict with planning criteria established to ensure the safety and protection of human life and property
- The potential for buildings and other obstructions to intrude into safeguarded airspace
- Potential noise changes conflicting with sensitive land uses.

As discussed in **Section 3.1**, DNL is the preferred noise metric of the FAA, HUD, USEPA, and DOD for modeling airport environs. According to USAF, FAA, and 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 a DNL of 65 to 75 dBA, and “normally acceptable” in areas exposed to noise where the DNL is 65 dBA or less (USDOT 1984).

4.2.1 No Action Alternative

Impacts

There would be no impacts on land use under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on land use would result from the implementation of the No Action Alternative.

4.2.2 Alternative A: Proposed Action

Impacts

Under the Proposed Action several new facilities would be constructed along Aspen Street. Current land use for these facilities is listed as open space, medical, industrial, and administrative. The proposed facilities would result in an increase of 409,472 ft² of new building space and parking.

On-Base Land Use. No adverse impacts on on-base land use would be expected. Under the Proposed Action, no land use conflicts with the Base General Plan are anticipated due to construction or aircraft noise. On-base land use in the vicinity of the proposed construction projects would be compatible with current land use in the vicinity of the construction projects

The locations of the proposed West Gate, 310 MSG Communications Squadron Facility, ARPC Administrative Facility, Security Forces Squadron Facility, and 310 MSG HQ would be constructed in areas currently designated as open space. The proposed 310 MSG CES Facility would be constructed on land that is currently designated as industrial. The location of the proposed improvements to Mississippi Gate would be completed in areas designated as administrative and open space. Land currently designated as open space for this project would need to be redesignated. The proposed Medical Squadron facility would be built in an area designated as medical (see **Figure 3-2**).

Several construction projects under the Proposed Action are within land areas impacted by noise levels in the DNL of 65 to 80+ dBA noise level range that is associated with aircraft operations at Buckley AFB. Construction projects within the 70 to 74 dBA noise contour include Projects 1, 2, 3, 4, and 5, while Projects 6 and 7 would be built within the 65 to 69 dBA noise contour. Additionally, Project 3 (Medical Squadron facility) could be considered a noise-sensitive building and is proposed in the 70 to 74 dBA range. According to AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the placement of buildings (USAF 1997a).

Off-Base Land Use. No off-base land use conflicts with the ROI are expected as a result of the Proposed Action. The proposed construction is at least 150 feet from the nearest off-base residence. At this distance, noise from construction would be approximately 82 dBA and would have minor adverse short-term noise impacts on residential populations.

Cumulative Impacts

Cumulative impacts on land use include other construction projects or aircraft changes that could potentially cause impacts on land use on- or off-base. Cumulative impacts on land use have been evaluated on- and off-base.

On-Base Land Use. Changes in land use would represent a negligible long-term effect on land use at Buckley AFB. Continued transition of Buckley AFB into a fully functioning AFB has created a need for expanded facilities on-base. See **Section 3.2** for a description of on-base land uses and categories. Buckley AFB works to maintain functional relationships with existing land uses by developing according to the Base General Plan.

The vast majority of future development on Buckley AFB will consist of administrative, light industrial, and community facilities. Of the proposed future land uses at Buckley AFB, land use varies notably from existing land use in only 5 of the 15 categories. Accompanied housing (which does not exist currently), would increase by 86 acres, while community service would increase six-fold to accommodate the new Youth Center, Child Development Center, Chapel, Skill Development Center, and Community Center. Outdoor Recreation would triple in size to accommodate the Williams Lake recreation area, as well as

new youth ballfields and other facilities. The Training land use would add more than 60 acres to provide space to install a new small arms range. The only land use that would decrease under these proposed land use changes is open space, which is expected to decrease by one-third. If these future projects are not built in accordance with the Base General Plan it could result in impacts on land use. Cumulative noise disturbances or construction of noise-sensitive facilities or functions in areas in the 65 to 80+ dBA noise contours could be considered an adverse impact (BAFB 2005a).

The Proposed Action would result in 409,472 ft² of building space and parking for facility construction projects (Nos. 1–8). Of these, Project Nos. 1, 2, 5, 6, 7, and 8 would result in the conversion of approximately 386,630 ft² or 8.8 acres of open space. This would result in a 0.3 percent decrease from the existing 2,388 acres of open space at Buckley AFB. Project No. 3 would not result in a reclassification of land use while Project No. 4 could result in land use reclassification.

Off-Base Land Use. No cumulative impacts on off-base land uses would be expected. There are no planned aircraft changes at Buckley AFB, therefore there is little potential for on-base land uses changes to affect off-base land uses. The City of Aurora is developing rapidly and development is moving eastward towards Buckley AFB. Continued growth outward from Aurora is expected to envelop Buckley AFB by the year 2020, as undeveloped land becomes scarce near the city center and in the E470 corridor, pressure will mount to develop in sensitive areas adjacent to Buckley AFB. Residential and other sensitive developments in the ROI adjacent to Buckley AFB would be buffered by the Buckley Research and Development Subarea Zoning District. This zoning district was adopted by Aurora to permit office, commercial, and industrial land uses in areas directly east of Buckley AFB (BAFB 2005a).

Buckley AFB addresses aircraft compatibility with surrounding land uses through its AICUZ Program. Future development in the 65 to 80+ dBA noise contours could cause an adverse cumulative impact in the ROI. However, there are no additional aircraft changes planned for Buckley AFB that would cause an adverse cumulative effect on land use (BAFB 2005a). Overall the Proposed Action does not have the potential to impact off-base land uses in the ROI.

4.3 Air Quality

The environmental consequences to local and regional air quality from a proposed Federal action are based on increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Effects on air quality were assessed by evaluating the following:

- Potential to cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected Air Quality Control Region (AQCR) emissions inventory
- Exceed any Evaluation Criteria established by a state implementation plan (SIP).

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.

In December 2003, the USEPA proposed to defer the effective date of air quality designations for certain areas of the country that did not meet the 8-hour O₃ NAAQS. The areas with these deferments, known as

EACs, agreed to reduce ground-level O₃ pollution earlier than the CAA requires. The MDIAQCR was designated as a nonattainment EAC Subpart 1 area for 8-hour O₃. However, in November 2007, the USEPA redesignated MDIAQCR as a maintenance area for ozone. Additionally, the MDIAQCR has been designated as a *serious* maintenance area for CO and a *moderate* maintenance area for PM₁₀ (USEPA 2005). **Table 4-1** lists the *de minimis* threshold values for Buckley AFB.

Table 4-1. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	<i>de minimis</i> Limit (tpy)
O ₃ (measured as NO _x or VOCs)	Maintenance	Outside O ₃ transport region	100
CO	Nonattainment	Serious	100
PM _{10/2.5}	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 emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 µg/m³ or more (40 CFR 52.21(b)(23)(iii)).

4.3.1 No Action Alternative

Impacts

There would be no impacts on air quality under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on air quality would result from the implementation of the No Action Alternative.

4.3.2 Alternative A: Proposed Action

Impacts

Construction Emissions. Under the Proposed Action, minor, short-term adverse effects would be expected from construction emissions and land disturbance. The proposed projects would result in minor impacts on regional air quality during construction activities, primarily from site-disturbing activities and operation of construction equipment.

The construction projects would generate total suspended particulate and PM₁₀ emissions as fugitive dust from ground-disturbing activities (e.g., grading, trenching, soil piles) and from combustion of fuels in construction 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 operations would also result in emissions of criteria pollutants as combustion products from construction equipment, including generators required for the first 30-90 days to operate equipment until permanent power becomes available, as well as evaporative emissions from architectural coatings and asphalt paving operations. These emissions would be of a temporary nature. The emissions factors and estimates were generated based on guidance provided in USEPA AP-42, Volume II, *Mobile Sources*. Fugitive dust emissions for various construction activities were calculated using emissions factors and assumptions published in USEPA's AP-42 Section 11.9.

For purposes of this analysis, the project duration and affected project site area that would be disturbed (presented in **Section 2**) was used to estimate fugitive dust and all other criteria pollutant emissions. The construction emissions presented in **Table 4-2** include the estimated annual construction PM₁₀ emissions associated with the Proposed Action. These emissions would produce slightly elevated short-term PM₁₀ ambient air concentrations. However, the effects would be temporary, and would fall off rapidly with distance from the proposed construction site.

Table 4-2. Total Proposed Construction Emissions Estimates from the Proposed Action

Description	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO _x (tpy)	PM ₁₀ (tpy)
Construction Emissions – CY 2008	1.517	0.317	1.897	0.032	15.60
Construction Emissions – CY 2009	5.835	1.233	6.801	0.152	25.16

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established methodologies for construction and experience with similar types of construction projects. Combustion by-product emissions from construction equipment exhausts were estimated using USEPA's AP-42 emissions factors for heavy-duty, diesel-powered construction equipment.

The construction emissions presented in **Table 4-2** include the estimated annual emissions from construction equipment exhaust associated with the Proposed Action in CYs 2008 and 2009. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. Early phases of construction projects involve heavier diesel equipment and earthmoving, resulting in higher NO_x and PM₁₀ emissions. Later phases of construction projects involve more light gasoline equipment and surface coating, resulting in more CO and VOC emissions. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term effects.

Aircraft Emissions. No effects on the air quality would be expected as a result of implementing the Proposed Action as the number of aircraft operations would not change. The additional F-16 aircraft would be used as backup aircraft and the number of sortie operations would remain the same.

Commuter Emissions. Minor, long-term adverse effects on air quality would be expected as a result of increasing commuter vehicles from the Proposed Action. Mobile sources such as vehicle emissions are not regulated at Buckley AFB and are not covered under existing permitting requirements by the CAPCD. In CY 2006, there were 13,126 personnel working at Buckley AFB (BAFB 2007a). To enable implementation of the Proposed Action, the USAF proposes an increase of 800 personnel; no changes in part-time personnel are anticipated as part of the Proposed Action.

Air emissions from the increase in POVs are presented in **Table 4-3**. A total of 450 of the 800 new personnel assigned to Buckley AB are presently working at the Buckley Annex. These people are present in the local area and therefore would not contribute new commuter emissions to the region. It was assumed that all 350 new area full-time and part-time personnel commute an average of 40 miles round-trip and work approximately 230 days per year. In addition, all 800 personnel would contribute to new air emissions on Buckley AFB driving approximately 5 miles per day. For this analysis, it has been assumed that the commuter fleet corresponding to these additional employees will reflect the passenger vehicle fleet on the roads using a national average vehicle mix. The data for passenger car vehicle miles traveled are estimates from the USEPA MOBILE6 and National Mobile Inventory Model (NMIM) modeling program. Emissions factors from the *AF IERA Air Emissions Inventory Guidance for Mobile Sources* were used to estimate emissions (IERA 2001). Details of these emissions calculations can be found in **Appendix D**. As shown in **Table 4-3**, emissions associated with the commuter vehicle traffic under the Proposed Action would be more than under current baseline conditions.

Table 4-3. Change in Commuter Emissions Estimates from the Proposed Action

Description	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO _x (tpy)	PM ₁₀ (tpy)
Proposed Commuter Emissions – 2009 and Beyond	121.41	141.94	1,796.01	9.18	153.60
Commuter Emissions – 2006	116.93	136.71	1,729.68	8.83	147.92
Change in Commuter Emissions	+4.48	+5.23	+66.33	+0.35	+5.68

Facility Operations. The new facilities constructed would involve new natural gas-fired boilers to heat the interior environment. These boilers would employ the best available technology. These boilers would not need to be permitted or included in Buckley AFB’s Title V permit as their rating would be less than 0.3 MMBtu/hour. In addition, the additional F-16 aircraft might require an engine test cell run and Buckley AFB would need to review their Title V permit to determine if a modification to the permit is required.

Table 4-4 provides the impact on air quality emissions from construction and commuters that would occur under the Proposed Action, and compares them to the regional criteria emissions (MDIAQCR) from the Proposed Action. **Table 4-4** (using CY 2009 as a worst-case scenario) illustrates that the Proposed Action would not generate pollutant emissions greater than the *de minimus* levels seen in **Table 4-1**. Therefore, a conformity determination in accordance with 40 CFR 93-153(c)(1) is not required. The emissions resulting from the Proposed Action are much less than 10 percent of the emissions inventory for MDIAQCR and are not regionally significant (e.g., the emissions are not greater than 10 percent of the MDIAQCR emissions inventory as identified in **Table 4-4**). There are no Class I areas within 10 kilometers of Buckley AFB, therefore project emissions are not significant with respect to the PSD regulations.

Cumulative Impacts

Cumulative impacts were evaluated based on calculations incorporating data from projects occurring since 2002, current projects, and projects planned out to 2010. Air quality calculations are provided in **Appendix D**, along with **Appendix E**, which includes summary air emissions (see Tables 4.2, 4.3, 4.4, and 4.5 in **Appendix E**).

The Proposed Action would result in continuous long-term minor adverse cumulative effects on air quality in the region. Past Buckley AFB development and aircraft mission training has impacted regional

Table 4-4. Total Emissions Estimates (Busiest Year) from the Proposed Action Compared to *de minimis* Values and MDIAQCR Regional Emissions

Description	NO _x (tpy)	VOC (tpy)	CO (tpy)	PM ₁₀ (tpy)
Proposed Construction Emissions (CY 2009)	5.84	1.23	6.80	25.25
Proposed Increase in Commuter Emissions	4.48	5.23	66.33	5.68
Total Proposed Annual Emissions	10.32	6.46	73.13	30.93
<i>de minimis</i> Values	100	100	100	100
MDIAQCR Regional Emissions (2001)	113,946	101,293	816,914	72,846
Percent of Regional Values	0.009	0.006	0.008	0.042

and local air quality and future activities at Buckley AFB would continue to impact local and regional air quality. However, localized effects of the Proposed Action would have minor contributions to the cumulative adverse impacts on local and regional air quality (see **Table 4-4**). A number of future projects at Buckley AFB involve adding additional stationary equipment, which could cause the thresholds established in the current Title V permit for Buckley AFB to be exceeded. Buckley AFB should determine if coordination with CAPCD is necessary for Title V permit modification.

4.4 Geological Resources

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 impacts on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development. Effects on geological resources were assessed by evaluating the following:

- Destruction of unique geological features
- Potential for soil erosion
- Proximity to or impact on geologic hazards (such as seismicity)
- Alteration of soil or geological structures that control groundwater quality or groundwater availability
- Alteration of soil structure or function.

4.4.1 No Action Alternative

Impacts

There would be no impacts on geological resources under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on geological resources would result from the implementation of the No Action Alternative.

4.4.2 Alternative A: Proposed Action

Impacts

Impacts on geologic resources under the Proposed Action takes into account the footprint of the facilities (i.e., approximately 10.6 acres total for buildings, roads, parking, and landscaping), and the construction footprint (estimated at approximately 26 acres for all projects under the Proposed Action).

Topography. Negligible long-term adverse effects would be expected on the natural topography of Buckley AFB as a result of implementing the Proposed Action. Construction of the proposed projects would likely require grading and leveling of the existing topography to prepare the site for development. Impacts on topography might be particularly evident with Project Nos. 6 and 7. These two projects would be anticipated to impact approximately 14.3 acres during construction with the final building footprint, including parking and landscaping, totaling approximately 4.4 acres. The construction area for these two projects would be located upgradient of a drainage associated with East Toll Gate Creek, indicating perhaps more slope would be involved in construction in this location than with the other proposed construction sites. However, in general, Buckley AFB is relatively flat and most of the projects under the Proposed Action are within previously disturbed areas as a result of past base activities, and therefore the adverse effects on the topography would be minimal.

Soils. Minor short- and long-term adverse effects on soils would be expected as a result of the construction activities such as grading, excavating, placement of fill, compaction, mixing, or augmentation necessary to prepare the sites for development. Approximately 26 acres of top soil would be permanently lost to construction activities, building footprints, parking lots, and streets unless the top soil is removed and saved for reapplication after construction has been completed. Additional impacts on soils could occur during construction activities as a result of erosion, if properly designed erosion and sediment controls and storm water management practices were not implemented during site development. Implementation of erosion and sediment control and storm water BMPs consistent with NPDES permit requirements, the base SWPPP, and other applicable codes and ordinances would minimize the potential for adverse effects resulting from erosion and transport of sediments in storm water runoff. In addition, all construction projects would implement BMPs to limit potential impacts resulting from construction activities. Fugitive dust from construction activities would be minimized by watering and soil stockpiling, which would reduce the total amount of soil exposed to potential suspension and wind erosion. Implementation of standard erosion-control practices (e.g., silt fencing, sediment traps, application of water sprays, phased construction, and prompt revegetation of disturbed areas) would also reduce potential impacts related to soil erosion and associated sedimentation.

Cumulative Impacts

On-base cumulative impacts were evaluated using calculations incorporating data from projects occurring since 2002, current projects, and projects planned out to 2012. Cumulative effects were also evaluated comparing on-base impacts with those of the ROI, which includes 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 negligible long-term adverse cumulative impacts. Past development activities at Buckley AFB, and surrounding the 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 152 square miles. Approximately 81 square miles (53%) of the city are developed (Aurora 2007). 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, since many of the proposed project areas at Buckley AFB have been previously disturbed, the functionality of the soils would not diminish. Disturbing 26 acres within Buckley AFB represents less than 0.001 percent of the undeveloped land within the City of Aurora.

4.5 Water Resources

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. Effects on water resources were assessed by evaluating the following:

- Potential to violate a Federal, state, or local law or regulation adopted to protect water resources
- Irreparable harm to human health, aquatic life, or beneficial uses of aquatic ecosystems
- Degradation of surface water or groundwater quality
- Alteration of surface runoff resulting in flooding, or placement of a structure within a 100-year floodplain
- Reduction of water availability or supply to existing users.

4.5.1 No Action Alternative

Impacts

There would be no impacts on water resources under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on water resources would result from the implementation of the No Action Alternative.

4.5.2 Alternative A: Proposed Action

Impacts

Negligible adverse impacts on groundwater quality would be anticipated as a result of the Proposed Action. Depth to groundwater is greater than 20 feet (6.1 meters) below ground surface, and intrusion of the new facilities into the subgrade would be minimal; however, the possibility exist that groundwater might be encountered during construction activities. For facilities with planned basements, depth to water needs to be determined to avoid the water table when possible. However if groundwater is encountered in elevator shafts or at subgrade levels, appropriate measures would be taken to pump out and dewater any groundwater.

Minor short- and long-term adverse effects on surface water and surface water quality would be expected as a result of the Proposed Action. Potential impacts include minor disruption of natural drainage patterns, contamination entering storm water discharge, or heavy sediment loading from construction activities. Because the USAF has a no-net-loss policy with respect to wetlands, and Buckley AFB would implement BMPs that would protect wetland areas, potential cumulative adverse impacts on wetlands would be minimized.

A minor increase in the conveyance of nonpoint source pollutants in runoff to the tributaries of the East Toll Gate Creek could occur in association with construction activities. The project-specific SWPPP required in accordance with the USEPA construction storm water permit regulations would minimize adverse impacts. This plan provides construction and post-construction BMPs intended to control and manage the loading of sediment and other pollutants to levels that would minimize degradation of downstream water quality.

Cumulative Impacts

On-base cumulative effects were evaluated using calculations incorporating data from projects occurring since 2002, current projects, and projects planned out to 2012. Summary tables for these calculations, which are updated and current at the time of this EA, are provided in **Appendix E** (see Tables E-1, 4.27, 4.28, and 4.29 in **Appendix E**). Cumulative effects were also evaluated by comparing on-base impacts with those of the ROI, which includes Toll Gate Creek Watershed.

Long-term minor cumulative impacts on surface water within the ROI are expected. Future development of Buckley AFB would have the potential to increase stream sedimentation and would further increase impervious surface area. Potential increase in sedimentation and other water resource degradation from development projects would be alleviated through use of BMPs and implementation of the project-specific SWPPP required in accordance with USEPA construction storm water permit regulations. An increase in impervious surfaces would occur; however, impacts on water resources would be minimized through use of 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 minor long-term adverse cumulative impacts on water resources.

Proposed BRAC-related construction projects would cause 26 acres of land disturbance from 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. Therefore, proposed development at Buckley AFB related to BRAC represents only one percent of the remaining land within the ROI that can be developed.

4.6 Biological Resources

Biological resources are evaluated in terms of compliance with Section 7 of the ESA and related laws and authorities. Emphasis is placed on species with legal, commercial, recreational, ecological, or scientific importance. Biological resources might be affected directly by ground disturbance or indirectly through such changes as increased construction noise. A habitat perspective is used to provide a framework for analysis of general classes of effects on biological resources (i.e., removal of critical habitat, noise, human disturbance). Effects on biological resources were assessed by evaluating the following:

- Potential for loss or alteration of suitable habitat and the proximity of similar habitat
- The proportion of the resource that would be affected relative to its occurrence in the region

- The sensitivity of the resource to proposed activities
- The duration of ecological effects.

4.6.1 No Action Alternative

Impacts

There would be no impacts on vegetation; wetlands; wildlife or wildlife habitat; or threatened, endangered, or other sensitive species under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on biological resources would result from the implementation of the No Action Alternative.

4.6.2 Alternative A: Proposed Action

Impacts

Vegetation. Under the Proposed Action, construction of Project Nos. 1, 2, 4, 5, 6, 7, and 9 would result in short-term, moderate adverse impacts on 24.1 acres of crested wheatgrass-dominated vegetation. Construction of Project No. 3 (approximately 1 acre) would not impact vegetation as the vegetation survey indicates the area is already developed. Construction of the Mississippi Gate Upgrade component of Project No. 8 would only impact 0.18 acres of midgrass prairie in the short-term. Projects 6, 8, and 9 could impact shelterbelt plantings; however, impacts on shelterbelts would be avoided and minimized.

Impacts on vegetation under the Proposed Action takes into account the footprint of the facilities, landscaping roads, and parking (approximately 10.6 acres), the disturbance acres (estimated at 26 acres for all projects under the Proposed Action), and the vegetative composition of the various project sites. In general, impacts on vegetation would be construction-related, since operation of the facilities would have no direct or indirect effects on vegetation. The construction footprint includes an estimate of disturbance associated with required utility connection to the facilities during construction. Adverse impacts on vegetation would be reduced by revegetating disturbed areas not planned for buildings, parking lots, roads, or landscaping. The areas would be seeded with native vegetation as soon as possible after construction is complete. While native plants will be used in the revegetation, not all species originally occupying the prairie habitat are likely to re-establish and thrive in the more landscaped environment resulting from the Proposed Action.

The long-term impact on vegetation would be similar in intensity and nature (moderate, adverse), but reduced to the footprint of the facilities, roads, parking areas, and landscaping (approximately 10.6 acres). Given the extent of crested wheatgrass and midgrass prairie vegetation on the base and assuming revegetation of the nonfacility construction footprint with native species, the overall impact on the vegetative composition of the base would be minor and adverse and either short- or long-term depending on the location.

Some elimination of weeds might result from construction of the projects, particularly Project No. 4; however, any beneficial impacts would be negligible. The expansion of the Aspen Way component of Project No. 9 would disturb areas currently vegetated with various species of thistle. This would provide the opportunity to reduce the infestation, or the construction disturbance could result in expansion of the

infestation into the Aspen Way road corridor. Thorough reseedling with native species after completion of construction in conjunction with aggressive eradication of thistle in newly disturbed areas would result in containment to existing areas of infestation and no adverse impacts on vegetation. Any equipment would be clean and free of seeds and mud prior to being brought on to Buckley AFB to prevent the spread of invasive species. Negligible beneficial impacts on vegetation could occur if thistle could be eradicated in disturbed areas through conversion to native vegetation as a result of post-construction revegetation.

Wetlands. Short-term impacts on wetlands under the Proposed Action would be minor and adverse with implementation of BMPs. There would be no long-term net impact on wetlands at the base level. The USAF would be committed to mitigating the loss of the small wetland area through either creation of a similar feature nearby, or enhancing the existing wetlands.

In accordance with EO 11990, *Protection of Wetlands* and AFI 32-7064, *Integrated Natural Resources Management* the USAF must demonstrate that there are no practicable alternatives to construction within wetlands. Under the Proposed Action, construction of Project Nos. 6 and 7 has the potential to impact wetlands. In addition, the component of Project No. 9 that involves expansion and realignment of Aspen Way could impact the same wetland as Project Nos. 6 and 7. Aspen Way currently crosses over potential wetlands and contains a drainage pipe. Expansion and realignment of Aspen Way is anticipated to include reconstruction of the bridge and increasing the size or replacement of the existing drainage pipe. Therefore, it is likely that several projects associated with the Proposed Action would occur close to or adjacent to wetlands.

The USACE wetland delineation process determined that the potentially affected wetland is nonjurisdictional and not subject to Section 404 permitting (DOD 2007). Construction activities adjacent to wetlands would result in minimal potential adverse effects because of erosion and sedimentation. These types of impacts would be minimized using BMPs. Implementation of BMPs (such as those specified for erosion and sediment control); spill prevention, control, and countermeasures procedures; and immediate revegetation after construction would reduce potential impacts on wetland resources. However, due to the proximity of the proposed construction site to the wetland, a permit might be required because some construction-related impacts on the wetland would be possible despite implementation of BMPs.

If the Proposed Action were approved, a FONSI/FONPA would be prepared and approved by the 460 SW demonstrating that the USAF has found no practicable alternatives to construction within the area that would affect the wetland.

Overall, any requirements for storm water retention for Project Nos. 1, 3, 5, 6, 7, and 9 should consider the possibility of improvements to and utilization of the existing wetland east of Aspen Way. By combining storm water management requirements and utilizing and improving existing wetlands, costs could potentially be lowered while improving overall water treatment. Additionally, less new land would be required to satisfy storm water requirements. Under this scenario, any potential permitting under Section 404 of the CWA could be combined into one permit application. The overall impact on wetlands under this scenario would be a moderate long-term beneficial impact.

Wildlife. The Proposed Action would be anticipated to have direct, short- and long-term, moderately adverse impacts on small mammal and ground-nesting bird habitat; approximately 26 acres would be subject to short-term impacts during active construction and approximately 10.6 acres would be permanently removed from this habitat on the base. Some prairie species would be dislocated and replaced by other species more tolerant of urban environments.

Threatened, Endangered, and Other Sensitive Species

Black-tailed Prairie Dogs. Direct adverse impacts on prairie dogs would occur from implementation of the Proposed Action. 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) directs black-tailed prairie dog management until it is revised or replaced by another EA or management directive. Prairie dogs are still considered a Species of Special Concern in Colorado and their burrows support numerous other wildlife species, including nesting burrowing owls.

Approved nonlethal and lethal methods of prairie dog removal would have the same impact on the metapopulation of black-tailed prairie dogs on the base; each would result in removal of individuals from that population. Prairie dogs were found to occupy the Proposed Action project sites; however, the number of individuals to potentially be removed from most of the sites is relatively low. Project sites 6 and 7 would have the greatest ground disturbance and the greatest square footage permanently removed from active prairie dog colonies. The West Gate portion of Project 8 would also impact the black-tailed prairie dog habitat. Impacts on the base's prairie dog population as a result of habitat loss, transfer, or lethal removal under the Proposed Action would be minor to moderate and long-term.

Migratory Birds. No direct impacts on burrowing owls would be anticipated from black-tailed prairie dog removal under the Proposed Action. In accordance with the *Supplement to Environmental Assessment of Proposed Prairie Dog Practices at Buckley Air Force Base* (BAFB 2001), should construction occur during the burrowing owl nesting season, preconstruction surveys would be conducted to determine the presence or absence of nesting burrowing owls at the proposed site. If nesting burrowing owls are identified, prairie dog removal would not be conducted.

The *Migratory Bird Treaty Act of 1918* (16 U.S.C. 703–712) as amended, and EO 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds* require Federal agencies to minimize or avoid impacts on migratory birds listed in 50 CFR 10.13. If design and implementation of a Federal action cannot avoid measurable negative impact on migratory birds, EO 13186 and AFI 32-7064, *Integrated Natural Resources Management*, require the responsible agency to consult with the USFWS and obtain a Migratory Bird Depredation Permit (USAF 1997b).

As required by EO 13186, the DOD entered into a Memorandum of Understanding with the USFWS in July 2006 that requires the DOD to implement BMPs for any proposed activity in an effort to reduce or avoid negative impacts on migratory birds. The following is a list of BMPs recommended for reduction or avoidance of impacts on migratory birds:

- Any groundbreaking construction activities should be performed before migratory birds return to the base (approximately 15 March) or after all young have fledged (approximately 31 July) 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, removal of prairie dogs and filling their burrows, 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 will 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. The 460 CES/CEV must be notified and would process all necessary paperwork and submit it to the USFWS.

Burrowing owls have nested in various locations throughout Buckley AFB where suitable prairie dog habitat occurs. Burrowing owls might be present during the breeding season (between March 1 and October 31) at the Proposed Action project sites, particularly the Proposed Action site for the New West Gate (a component of Project No. 8), as active nests were found in the vicinity in 2006 and again in 2007. Direct impacts on burrowing owls could occur if nests (see **Figure 3-6**) identified in 2006 and 2007 in the area of the new West Gate would be directly impacted by the construction of the new West Gate component of Project No. 8. To deter a burrowing owl from nesting in or near the construction site, prairie dogs should be removed and burrows destroyed prior to March 1. However, since destruction of 100 percent of burrows on the site is nearly impossible, should construction occur during burrowing owl/migratory bird nesting season, preconstruction surveys would be conducted to determine the presence or absence of nesting birds at the proposed sites, in accordance with the *Supplement to Environmental Assessment of Proposed Prairie Dog Management Practices at Buckley Air Force Base* (BAFB 2001). If nesting burrowing owls are present, a 150-foot (45.72-meter) buffer would be established around active nest sites during the breeding season to protect owls from disturbances associated with construction, especially increased noise. Given these measures, direct and short-term impacts on nesting individuals or young burrowing owls from construction-related activities would be negligible.

Because burrowing owls establish nests in new locations from year to year, and other habitat is available in nearby areas at Buckley AFB, the occupants of existing nests might use new nesting locations in the future. Indirect and long-term impacts on burrowing owls from the Proposed Action would include loss of habitat as portions of prairie dog colonies are destroyed and replaced with facilities under the Proposed Action. The loss of prairie dog burrows would reduce the availability of potential burrowing owl nest sites, although nest sites would still be available in other areas of Buckley AFB. Procedures for management of burrowing owl nests outlined above would be implemented at all project sites to prevent nesting outside breeding season, which would only have a negligible adverse impact on burrowing owls because of the availability of other suitable habitat at Buckley AFB. Implementation of procedures outlined above for nests found within construction areas during the breeding season would result in short- and long-term negligible to minor adverse impacts on burrowing owls, depending on the number of nests involved.

Cumulative Impacts

On-base cumulative effects were evaluated based on calculations incorporating data from Buckley AFB projects occurring since 2002, current projects, and projects planned out to 2012. Cumulative effects were evaluated by comparing on-base impacts with those of the ROI, which includes the City of Aurora.

The Proposed Action, in conjunction with past and future development both on and outside Buckley AFB, would result in overall long-term minor adverse impacts on biological resources. Existing development and operations at Buckley AFB currently impact plants and animals. At Buckley AFB, the total number of acres to be disturbed or for planned development is relatively small in comparison to the number of acres of biological resources on Buckley AFB. 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.

Cumulative actions are causing extensive reduction in habitat and permanent loss of prairie vegetation and habitat. The Proposed Action would cause an additional permanent loss of 10.6 to 26 acres of prairie habitat/vegetation. Landscaping around the buildings will not replace the prairie habitat as this will change to a more urban habitat which other species will 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. Considering approximately 47 percent of the City of Aurora is undeveloped, a large portion of the city continues to function as wildlife habitat, although the quality of that habitat might be degraded by the intrusion of development.

4.7 Cultural Resources and Viewshed

Cultural resources are evaluated in terms of compliance with Section 106 of the National Historic Preservation Act (NHPA) and related laws and authorities. Effects on cultural resources and the viewshed were assessed by evaluating the following:

- The degree to which the Proposed Action or alternatives could potentially physically alter, damage, or destroy all or part of a resource or altering characteristics of the surrounding environment that contribute to the resource's significance
- The degree of neglecting the resource to the extent that it deteriorates or is destroyed
- Whether the Proposed Action or alternatives would lead to the sale, transfer, or lease of the property out of agency ownership (or control) without adequate and legally enforceable restrictions or conditions to ensure preservation of the property's historic significance
- The degree to which the Proposed Action or alternatives could lead to the alteration or impairment of a viewshed, scenic quality, or aesthetic values not consistent with applicable laws or regulations or introducing visual or audible elements that are out of character with the property, or alter its setting.

4.7.1 No Action Alternative

Impacts

There would be no impacts on cultural resources and viewsheds under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on cultural resources and viewsheds would result from the implementation of the No Action Alternative.

4.7.2 Alternative A: Proposed Action

Under regulations (36 CFR Part 800) implementing Section 106 of the NHPA, an adverse effect is found when an undertaking might alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. 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 the integrity of character-defining features. Visual effects also would be an adverse effect if visual elements are introduced that are out of character with and would diminish the integrity of a property's significant historic features or setting (36 CFR 800.5(a)(2)(iv), (v)).

Impacts

There would be no adverse effect on historic properties as a result of the Proposed Action. The locations of projects under this alternative have been previously surveyed for historic buildings and archaeological sites as part of previous basewide efforts. The proposed project locations do not contain historically significant buildings or archaeological sites. According to the draft ICRMP, the Colorado SHPO has previously agreed that no further survey for archaeological sites in areas outside Buckley AFB's secure area is necessary. Proposed Projects 1 through 7 and 9 would be at least two blocks from Buildings 801 and 909, the historic aircraft hangars, in areas of existing buildings, parking, and roads.

Long-term, minor beneficial impacts on cultural resources (historic resources) and viewsheds would occur. Proposed Project No. 8 consists of the construction of a west entrance gate, access road, and visitor center with parking. These new facilities would be west of the historic radomes (Buildings 402 through 405 inclusive). The small size of the proposed facilities would not interfere with the line of site. The new access road would create a new visual corridor that would terminate near the historic radomes, enhancing views of them from the west.

Cumulative Impacts

Cumulative impacts on cultural resources and viewsheds were determined by evaluating known construction projects both on-base and within the ROI. Cumulative impacts on cultural resources and viewsheds would be minor, long-term, and beneficial, and there would be no adverse effect on historic properties. A new Base West Gate and west access road would create a new visual corridor with direct, formal views of the radomes from the west. The new road would terminate at the secure area directly facing the radomes. To the west of the secure area would be open areas, including ball fields and open space for the nearby family housing. From the northwestern corner of the secure area, the radomes would still be visible with views across the single-story structures of the new development. Off base, the radomes are visible from many miles away, due to 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 single-story CF would not affect the views of the radomes from great distances. The Proposed Action would not contribute to the off-base cumulative scenario for cultural resources and viewshed.

4.8 Socioeconomic Resources

Construction expenditures are assessed in terms of direct effects on the local economy (employment, purchase of goods and services, availability of housing and services). 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 go unnoticed in an urban area, but could have considerable impacts in a rural region. If potential socioeconomic changes were to result in substantial

shifts in population trends or a decrease in regional spending or earning patterns, they would be considered adverse. Effects on socioeconomic resources were assessed by evaluating the following:

- Change to the local economy, employment, personal income, population, or other demographic characteristics
- Changes to social services or social conditions, including property values, school enrollment, parish or municipal expenditures, or crime rates.

4.8.1 No Action Alternative

Impacts

No impacts would be expected as a result of implementing the No Action Alternative. However, the negligible to minor beneficial impacts expected from implementing the Proposed Action would not be realized.

Cumulative Impacts

No cumulative impacts on socioeconomic resources would result from the implementation of the No Action Alternative.

4.8.2 Alternative A: Proposed Action

Impacts

The Proposed Action at Buckley AFB would have short- to long-term direct and indirect, beneficial effects on economics and employment in the ROI. The proposed construction would result in 409,472 ft² of building space and parking. It is assumed that local construction crews and materials would be used for the \$48 million in estimated construction activities, which would occur from FYs 2007 to 2009. These construction activities would represent a 1.5 percent increase in spending at Buckley AFB per year for 3 years. This temporary increase in construction spending would not be significant and would provide only short-term employment opportunities.

The addition of 800 personnel would represent a 6.1 percent increase in the 13,126 total personnel currently at Buckley AFB. However this increase in personnel, while providing both short-term and long-term beneficial economic effects on the ROI, would not be significant in terms of local or regional employment or other demographics.

Cumulative Impacts

On-Installation Activities. The increase in personnel, while providing both short-term and long-term beneficial economic effects on the ROI, would not be significant in terms of local or regional employment or other demographics. Continued construction and personnel changes at Buckley AFB would impact the ROI and surrounding areas. Construction activities would result in minor beneficial impacts when combined with other past and present activities at Buckley AFB. In addition Buckley AFB would gain approximately 1,500 new personnel from the Proposed Action and CF project at Buckley AFB. The addition of 1,500 personnel would represent a 10 percent increase in personnel (800 from BRAC actions and 700 from the CF) currently at Buckley AFB.

Off-Installation Activities. Currently there are no planned improvements for the Colfax Corridor East of I-225 that would affect the ROI (see **Section 2.6.1**). There are planned or completed improvements for the I-225 Corridor and City Center Strategic Area and the E470 Corridor Strategic Area which have the potential for cumulative effects (see **Section 2.6.1**). Some of the projects include Aurora Municipal Center (complete), Arapahoe County administrative annex (complete), a new ADT company office building, revitalization of Aurora Mall, and planned residential developments (see **Section 2.6.1**). These completed and planned improvements for the development corridors adjacent to Buckley AFB would have minor beneficial indirect impacts on socioeconomics in the ROI. Planned construction and increases in the local population would benefit the surrounding areas of Buckley AFB and the ROI.

The 1,500 new personnel employed at Buckley AFB would represent a 0.5 percent increase from the 301,562 persons employed in Arapahoe County as of June 2007 (CDLE 2007). This minor increase in employment at Buckley AFB would have negligible effects on socioeconomic resources when compared against the ROI.

4.9 Utilities

Impacts on utilities are evaluated based on their potential for disruption or improvement of existing levels of service and additional needs such as energy or water consumption, and solid waste and sewage capacity. Impacts might arise from energy, water, or other service needs created by either direct or indirect workforce and population changes related to implementation activities. Effects on utilities were assessed by evaluating the following:

- The increase or decrease in levels of service caused by the Proposed Action or alternatives
- The capacity of the existing utilities systems to accommodate projected increased levels of service caused by the Proposed Action or alternatives.

4.9.1 No Action Alternative

There would be no impacts on utilities under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Impacts

Under the No Action Alternative, baseline conditions would remain unchanged and no impacts would occur.

Cumulative Impacts

No cumulative impacts on utilities would result from the implementation of the No Action Alternative.

4.9.2 Alternative A: Proposed Action

Issues and concerns regarding infrastructure are related to (1) availability of necessary infrastructure to support the facility; and (2) creation of stress on existing infrastructure systems, such that they must be updated or changed. Assessing impacts on infrastructure entails a determination of infrastructure that would be used as a result of the Proposed Action or alternatives.

Impacts

Electrical System and Natural Gas. Under the Proposed Action, there would be a long-term minor adverse effect on the demand for electricity and natural gas. Each new construction project would require electric power for heating, ventilation, and air conditioning (HVAC); communications equipment; computers; security systems; appliances; and general building and facility lighting. The increase in electrical use can be estimated on the basis of new building areas. Buckley AFB facilities consist of approximately 2.6 million gross ft² (this number does not include building space to be added from the CIP or other new facilities). The Proposed Action would add 409,472 ft² of building space and parking. Assuming a direct ratio of building areas to electrical use (49.2 kWh/year), the Proposed Action would result in an increase in electrical use of 20,158,814 kWh/year, or an increase of 16 percent. According to Buckley AFB's General Plan, the electrical system is at 70 percent of its capacity. A 16 percent increase in electrical consumption would be within Buckley AFB's capacity; therefore, the Proposed Action would have a direct long-term minor effect on the electrical system. According to the Department of Energy's Energy Information Administration, Xcel Energy produced roughly 26.5 million megawatt hours in Colorado. The increase in electrical consumption from the Proposed Action would account for 0.07 percent of the electricity produced by Xcel Energy.

Similarly, the Proposed Action would increase natural gas consumption on Buckley AFB by 16 percent, or 240.5 million cubic feet. According to Buckley AFB's General Plan, the natural gas system is at approximately 40 percent of its capacity. A 16 percent increase in natural gas consumption would be within Buckley AFB's capacity; therefore, the Proposed Action would have a direct minor effect on the natural gas system. In 2006, Xcel Energy delivered 125.1 billion cubic feet of natural gas in Colorado; a 16 percent increase of natural gas consumption at Buckley AFB would account for 0.02 percent of natural gas delivered (Kwerneland 2007).

Construction activities would result in minimum demand on Buckley's electrical supply. As a rough order of magnitude using the demand for facilities and the fact that most activities at a construction site involve vehicle and generator-run equipment, the construction phase of the Base Closure and Realignment (BRAC) facilities is estimated at 2,000 to 3,000 kWh/year. There would be no demand on Buckley AFB's gas utilization for the construction phase.

Underground electrical and natural gas supply lines would need to be run from existing distribution lines and be connected to new facilities. The distance that electrical and natural gas lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to existing supplies. **Table 2-1** lists approximate distances of new electrical and natural gas.

Water Systems. Short- to long-term minor adverse impacts would be expected on water systems as a result of the Proposed Action. Each of the proposed projects involving the construction of new buildings would require permanent and continuous availability of water due to increased personnel and irrigation. Buckley AFB has a physical limitation based on the base's water main and meter size. In most cases, underground water supply lines would need to be run from existing laterals and mains and be connected to new structures. The distance that water supply lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to an existing water supply line, see **Table 2-1** for approximate distances of new water lines.

Construction activities would require water for dust suppression. The need for water for dust suppression typically depends on the following:

- Duration and area of land disturbance
- Temperature

- Humidity
- Wind direction and speed
- Soil characteristics (size, density, moisture content)
- Frequency, duration, and volume of natural precipitation events.

Based on other ongoing construction activities at Buckley AFB it is assumed that approximately 500 gallons/acre/day would be used for dust suppression. To account for equipment traffic and ground disturbance around the footprint of the building, an additional 15 percent was included in the calculation. Approximately 10 acres of disturbed ground would require 5,750 gallons/day for dust suppression during construction.

Additional water supply would also be required for the proposed new facilities. Although 450 of the 800 new personnel to Buckley AFB are at the Buckley Annex, the net increase in local utilities for the Aurora area and Buckley AFB would be the result of all 800 new personnel to Buckley AFB. In CY 2006, Buckley AFB used 128,645,000 gallons of water. This equates to 39 gallons of water consumed per person per day for a 250-day work year. Weekend use of water by reserves and other employees (e.g., maintenance, custodial) would add another 202,000 gallons per year demand on the Buckley AFB water usage. To accommodate the additional staff at Buckley AFB approximately 31,200 gallons of additional water would be consumed on a daily basis. This represents an increase of 8.864 percent over current consumption and substantially less than 1 percent of the 37 million gallons of water per day (13,580 million gallons per year in 2003) of water distributed by the City of Aurora. Therefore, the anticipated increase in water use would be minor.

In addition to the new facilities requiring water for construction, personnel use, and irrigation, new sanitary water connections would have to be made to existing lines for the disposal and treatment of wastewater. The distance sewer lines would need to be run would depend on the location of the proposed facility and the location of the nearest feasible tie-in to an existing sewer line, see **Table 2-1** for approximate distances of new sanitary sewer lines. Generation of wastewater would be of a similar scale as the impact on potable water discussed above. Based on base population, Buckley AFB generates 23.54 gallons of wastewater per day per person. The Proposed Action would increase the wastewater generation and discharges by 18,830 gallons per day, a 0.61 percent increase daily. After full implementation of the Proposed Action, wastewater discharge from Buckley AFB would increase substantially less than 1 percent of the total Metro Wastewater Reclamation District treatment plant capacity.

Storm Water. Implementation of the Proposed Action construction projects would increase the amount of impervious surfaces by about 9.2 acres, and would represent a minor short-term adverse impact. As a component of these projects, storm water management controls would be designed and implemented consistent with NPDES permit requirements, Air Force ETL 03-1: *Storm Water Construction Standards*, and site specific SWPPP to minimize potential adverse effects on surface waters. Compliance with Air Force ETL 03-1: *Storm Water Construction Standards*, 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 for the Proposed Action.

BMPs can also be implemented to decrease sedimentation caused by erosion. Preventive BMPs could include the following:

- Limit stockpiling of materials onsite
- Manage stockpiled materials to minimize the time between delivery and use
- Cover stockpiled materials

- Install snow or silt fences around material stockpiles, storm water drainage routes, culverts, and drains
- Install hay or fabric filters, netting, and mulching around material stockpiles, storm water drainage routes, culverts, and drains.

Solid Waste. Generation of solid, nonhazardous waste and construction debris would increase as a result of construction, and would represent a minor short-term adverse impact. Every effort would be made to recycle or reuse recyclable construction and other materials to avoid their automatic disposal. The increase in staff would represent a minor increase in solid waste generation. In FY 2002, approximately 4 tons (8,000 pounds) of solid waste were generated daily, which is approximately 0.9 pounds per person per day (BAFB 2006f). It is estimated that 800 new employees would generate 720 additional pounds of solid waste per day, a minor adverse impact.

Cumulative Impacts

On-base cumulative effects were evaluated using calculations incorporating data from projects occurring since 2002, current projects, and projects planned out to 2012. Summary tables for these calculations are provided in **Appendix E** (see Tables 4.3, 4.12, 4.13, 4.15, 4.16, 4.17, and 4.19 in **Appendix E**). Cumulative effects were also evaluated by comparing on-base impacts with those of the ROI.

Short-term cumulative impacts on utilities would result 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 truly 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 moderately adverse. The Proposed Action would contribute to the cumulative impact scenario on Buckley AFB and in the ROI; however, increases in utility usages under the Proposed Action would result in minor short- to long-term adverse impacts.

Electrical System and Natural Gas. Negligible adverse impacts on electrical systems and natural gas would be expected. **Table 4-5** displays cumulative totals of utilities usage from the cumulative impacts scenario. The 2005 BRAC Commission projects would require electric power for HVAC, communications equipment, computers, security systems, appliances, and general building and facility lighting. The increase in electrical use can be estimated on the basis of new building areas. New building area from the CIP (1.9 million ft²) would increase electrical use by 70 percent. Additional electrical supply demands for the CF would be supplied by the 47-megawatt line to be installed as part of the project; therefore, the CF would make no contribution to cumulative impacts on electrical systems. According to the Base's General Plan, the electrical system is at 70 percent of its capacity (BAFB 2005a). A 78 percent increase in electrical consumption would require an increase in base capacity. As stated previously, in 2005 Xcel Energy produced 26.5 million megawatt hours. A 78 percent increase of electrical consumption at Buckley AFB would represent a 1.0 percent increase of Xcel Energy's production.

Similarly, natural gas consumption from all projects would result in a 105 percent increase over CY 2006 base consumption. The Base General Plan states that the existing system is adequate to support the missions on Buckley AFB and was operating at approximately 40 percent of its capacity. "However, significant expansion of facilities could result in the system being overtaxed. Future growth must be evaluated to determine if upgrade or expansion of the natural gas distribution system is necessary" (BAFB 2005a). Xcel Energy delivered 125.1 billion cubic feet of natural gas in Colorado; a 105 percent increase of natural gas consumption at Buckley AFB would account for 0.2 percent of natural gas delivered (Kwerneland 2007).

Table 4-5. Cumulative Long-Term Utilities Usage

	Natural Gas (ccf/year)	% Incr.	Electric (kWH/ year)	% Incr.	Water (gallons/ year)	% Incr.	Waste Water (gallons/ year)	% Incr.	Solid Waste (tons/ year)	% Incr.
2006 Baseline	1,503,234		127,928,807		128,645,000		80,329,000		1,226	
CIP	1,045,143	70	89,300,000	70	25,000,000	19	25,000,000	31	1,618	132
BRAC Projects	240,517	16	9,964,000	8	5,002,000	9	8,863,000	10	93	7.5
CF	300,000	23	-	-	5,486,000	4	5,486,000	6.8	96	8
Total Additional	1,585,660	105	99,264,000	78	38,488,000	27	32,592,000	43	1,762	144

Note: ccf = hundred cubic feet

Water Systems. Negligible adverse cumulative impacts on water systems would be expected. The anticipated cumulative increase in water consumption would be minor in comparison to current consumption rates and would result in negligible effects on water systems. Between 2007 and 2010, yearly water consumption will increase by 25 million gallons from the CIP, 5 million gallons from the 2005 BRAC Commission projects, and 5.49 million gallons for the CF. Currently, roughly 352,000 gallons per day are consumed; an increase of 89,293 gallons per day would represent a 25 percent increase over current consumption and substantially less than 1 percent of the 37 million gallons of water per day (13,580 million gallons per year in 2003) of water distributed by the City of Aurora. A 25 percent increase would appear to be within its remaining capacity.

Although not all of the waste water consumed at Buckley AFB contributes to the total discharge rate, it is assumed that for these projects, waste water discharge will be equivalent to water consumption. An increase of 32.6 million gallons per year would increase yearly discharge by 43 percent and would be substantially less than 1 percent of the 185 million gallons of water per day treated by Metro Wastewater Reclamation District.

Solid Waste. Negligible short-term adverse cumulative impacts would be expected. Cumulative impacts on solid waste resulting from demolition and construction would be short-term in that the waste would be generated over the period of construction, and would have minimal long-term effects on the capacity of the landfill. Additional long-term impacts on solid waste would result from increased generation of solid waste by increased staffing levels. Total solid waste generation from increased staffing resulting from the CIP, 2005 BRAC Commission actions at Buckley AFB, and CF projects would be 1,762 tons per year, a 144 percent increase. Approximately 2 percent of the solid waste generated in 2006 was incinerated; therefore, approximately 1,727 tons of additional solid waste would reach the landfill as a result of the expansion projects. This amount represents significantly less than 1 percent of the total waste deposited in the landfill and would have a negligible impact on the disposal of solid waste.

4.10 Transportation/Traffic

Transportation resources consist primarily of the road network and its ability to support movement of people. Transportation would be affected by the volume of vehicles using the road network and the capacity of the road network. Aspects of traffic that might be considered include speed and time required

to complete travel, comfort and convenience, and traffic interruptions. Effects on transportation and traffic were assessed by evaluating the following:

- Whether the Proposed Action or alternatives lead to long-term interference with access to transportation routes
- Whether the Proposed Action or alternatives result in a permanent decrease in LOS of key transportation arteries.

4.10.1 No Action Alternative

Impacts

Under the No Action Alternative, no new gate would be constructed, and no improvements would be made to existing gates. Therefore, existing waits or backups at the gates would continue, which would be considered a negligible continuing adverse impact.

Cumulative Impacts

Cumulative impacts as a result of the No Action Alternative would result in negligible adverse impacts on transportation/traffic.

4.10.2 Alternative A: Proposed Action

The Proposed Action would add approximately 800 new employees to Buckley AFB. Since 450 of the new personnel are currently at the Buckley Annex, the net increase in regional traffic would be 350 new personnel; with as many as 800 new employees accessing the Buckley AFB gates. To estimate daily and peak hour vehicle-trips generated by the new employees, the standard practice is to consult a document known as *Trip Generation* (7th Edition, 2001) published by the Institute of Transportation Engineers (ITE 2001). This document, recognized as the industry standard for estimating new vehicle-trips, provides daily and peak-hour trip generation rates per employee.

Daily and peak-hour trip generation rates were used to estimate new vehicle-trips generated by the new employees. New employees would generate an estimated 2,656 new daily vehicle-trips and about 384 new vehicle-trips during the morning (6:30 to 7:30 a.m.) peak hour and 368 new vehicle-trips during the evening (4:00 to 5:00 p.m.) peak hour (see **Table 4-6**).

Table 4-6. New Proposed Personnel Vehicle Trip Generation

Land Use Description	Quantity	Trip Generation						
		Daily	Morning Peak Hour			Evening Peak Hour		
			In	Out	Total	In	Out	Total
General Office	800 Employees	2,656	338	46	384	63	305	368

Source: ITE 2001

Notes: Trip Generation Rates per *Trip Generation* (ITE 2001)

Daily – 3.32 / Employee

A.M. Peak – 0.48 / Employee (88% inbound, 12% outbound)

P.M. Peak – 0.46 / Employee (17% inbound, 83% outbound)

Impacts

Short- to long-term minor adverse impacts on transportation and traffic would be expected under the Proposed Action. The highest overall daily traffic impact is projected to be along Aspen Street because it has lower existing daily volumes than the surrounding roadways. The percentage impacts on Aspen Street range between 15 and 31 percent. **Table 4-7** shows daily traffic projections for on- and off-base roadways and shows peak-hour projection at base access points to 6th and Mississippi Avenues. The Proposed Action would increase daily volumes on 6th Avenue to about 21,000 vehicles per day (vpd) west of the gate and to

Table 4-7. Approximate Proposed Action Daily Traffic Volume Impacts

Roadway Name	Existing Daily Traffic	Projected Daily Traffic	Percentage Increase
6th Avenue – West of Gate	19,900	20,940	5.2%
6th Avenue – East of Gate	10,100	10,450	3.5%
Mississippi Avenue – West of Gate	14,600	15,200	4.1%
Aspen Street – North of Mississippi Gate	6,200	7,130	15.0%
Aspen Street – South of the Main Gate	6,000	7,390	23.2%
Aspen Street – Between Steamboat and Breckenridge Avenues	3,000	3,930	31.0%

about 10,500 vpd east of the gate. Mississippi Avenue daily volumes increase to more than 15,200 vpd west of the gate. Along Aspen Street, Alternative A increases daily volumes to more than 7,000 vpd near the 6th Avenue and Mississippi Avenue gates and to almost 4,000 vpd between Steamboat and Breckenridge Avenues.

Table 4-8 provides LOS at the Buckley AFB intersections with 6th Avenue and Mississippi Avenue. The LOS is a measure used to describe the operational characteristics for intersections as a whole and for specific movements at an intersection. The LOS is a qualitative assessment of traffic operations with letter designations ranging from LOS A (essentially uninterrupted flow) to LOS F (a breakdown of traffic flow with excessive delay of more than 80 seconds per vehicle and queuing). The letter designations are based on a calculated average vehicular delay, in seconds per vehicle (TRB 2000). The LOS designations given in **Table 4-8** reflect the LOS for each movement group and for the overall intersection. In general, for urban areas, acceptable LOS for the overall intersection is LOS D; however, the same standard of acceptability is typically not applied to individual turn movements which can operate at a lower LOS.

As shown in **Table 4-8**, in most cases the Proposed Action would not change the overall intersection LOS but would change intersection delay. At the 6th Avenue intersection with the Main Gate and at the Mississippi Avenue intersection at the Mississippi Gate, in the evening peak hour, the overall impact on intersection delay is less than 15 percent. In the morning peak hour, at the Mississippi Avenue intersection, the intersection delay increases by 49 percent because Alternative A adds traffic volumes to already poorly operating turn movements (i.e., the eastbound left-turn movement). Existing and projected traffic volumes and LOS suggest the need for eastbound to northbound dual left-turn lanes at the Mississippi Gate. At the 6th Avenue and Main Gate in the morning peak hour the intersection delay decreases by nearly 7 percent under Alternative A because increased traffic volumes would be added to the least impacted turn lanes.

Table 4-8. Intersection Level of Service and Delay Impacts – Alternative A

Intersection *	Morning Peak Hour			Evening Peak Hour		
	Existing LOS and Delay (sec./veh.)	Projected LOS and Delay (sec./veh.)	Percent Change in Delay	Existing LOS and Delay (sec./veh.)	Projected LOS and Delay (sec./veh.)	Percent Change in Delay
6th Avenue with Main Gate	LOS B 16.4	LOS B 15.3	-6.7%	LOS C 29.0	LOS C 33.1	14.1%
Mississippi Avenue with Mississippi Gate	LOS D 51.2	LOS E 76.5	49.4%	LOS B 19.4	LOS B 19.6	1.0%

Note: * = LOS data were only available for the Main Gate and Mississippi Gate at the time this EA was written.

The new employees would also impact gate operations. The 15-minute processing rates for FPCON Bravo conditions (gate personnel are checking all IDs and decals) were calculated. According to *Gate Design and Traffic Engineering Guidance* (BAFB 2003b), Bravo conditions are “the baseline for sustained operations” and under these conditions the vehicle processing rate with two ID checkers is about 125 vehicles per lane per 15-minute period. At the Main Gate and 6th Avenue, two lanes exist from the gatehouse to 6th Avenue to allow vehicles to stack as IDs and decals are checked by base guards. At the Mississippi Gate there are also two lanes for processing vehicles.

With existing traffic flows and under Bravo+ conditions, two inbound lanes with two ID checkers are needed between 5:45 and 7:45 a.m. With the additional new employees the time range needed for two inbound lanes changes to 5:30 to 8:00 a.m. At both gates, two inbound lanes with two ID checkers per lane can sufficiently process even at the highest anticipated peak 15-minute volume. The 800 new employees would result in long-term minor adverse effects on gate queues, increasing queue length by two vehicles at each gate. The resulting longer queues would still be contained between the gate and the cross street. Although data were not available to analyze impacts on gate traffic at the Telluride gate it is assumed that overall gate impacts would be lessened with the operation of the Telluride Gate and the proposed West Gate.

Proposed New West Gate and Mississippi Gate Expansion

Under the Proposed Action, the proposed new West Gate would be added near the intersection of Devil’s Thumb Avenue and Telluride Street. Access to the new gate would be from Airport Boulevard. Overall, the addition of the West Gate would lead to minor beneficial impacts on all other existing gates and roadways on Buckley AFB as some existing traffic would redistribute to the new gate. However, the redistribution of traffic to the new gate could also have a minor negative long-term impact on Airport Boulevard or other off-base roads leading to the new gate as traffic redistributes to the gate.

Expansion of the Mississippi Gate would result in an additional entrance lane and associated infrastructure to allow for increased vehicle processing capacity. Under Alternative A, the Proposed Action, the additional processing capacity at Mississippi Gate would alleviate the potential increase in delay at this gate caused by additional employees trying to access the southwestern area of the base. The impact on delay at the Mississippi Gate due to the proposed upgrades would be moderate, long-term, and beneficial. The proposed roads to support the proposed West Gate, additional traffic lane at the

Mississippi Gate, and realignment of Aspen Way with Beaver Creek and Aspen Streets are shown in **Figure 4-1**.

Expansion of Aspen Way and Infrastructure, Road, and Utility Improvements

Proposed infrastructure and utility improvements to support the Proposed Action would result in temporary moderate adverse impacts on local traffic delays whenever any of these projects coincides with a road. These proposed improvements would need to be sequenced such that the overall impact on traffic delays is minimized at any given time. Onsite traffic control personnel, adequate detours, and sufficient advance warning before construction impacts occur on roadways within Buckley AFB would also help to minimize the overall impact.

Cumulative Impacts

On-Base Traffic. Cumulative on-base traffic impacts would be long-term, moderate, and adverse of which the Proposed Action contributes a moderate amount to. **Table 4-9** shows the cumulative daily and peak-hour traffic projections for the proposed BRAC actions and for the projects listed in **Appendix C** (see Table 4.23 in **Appendix E**) and accounts for a new West Gate located near the Devil’s Thumb and Telluride intersection. The traffic projections along 6th Avenue, Mississippi Avenue, and Airport Boulevard also include traffic generated by new land uses and new roadways planned in the Buckley area. These projections were developed from the Denver area transportation demand model developed by Denver Regional Council of Governments (DRCOG).

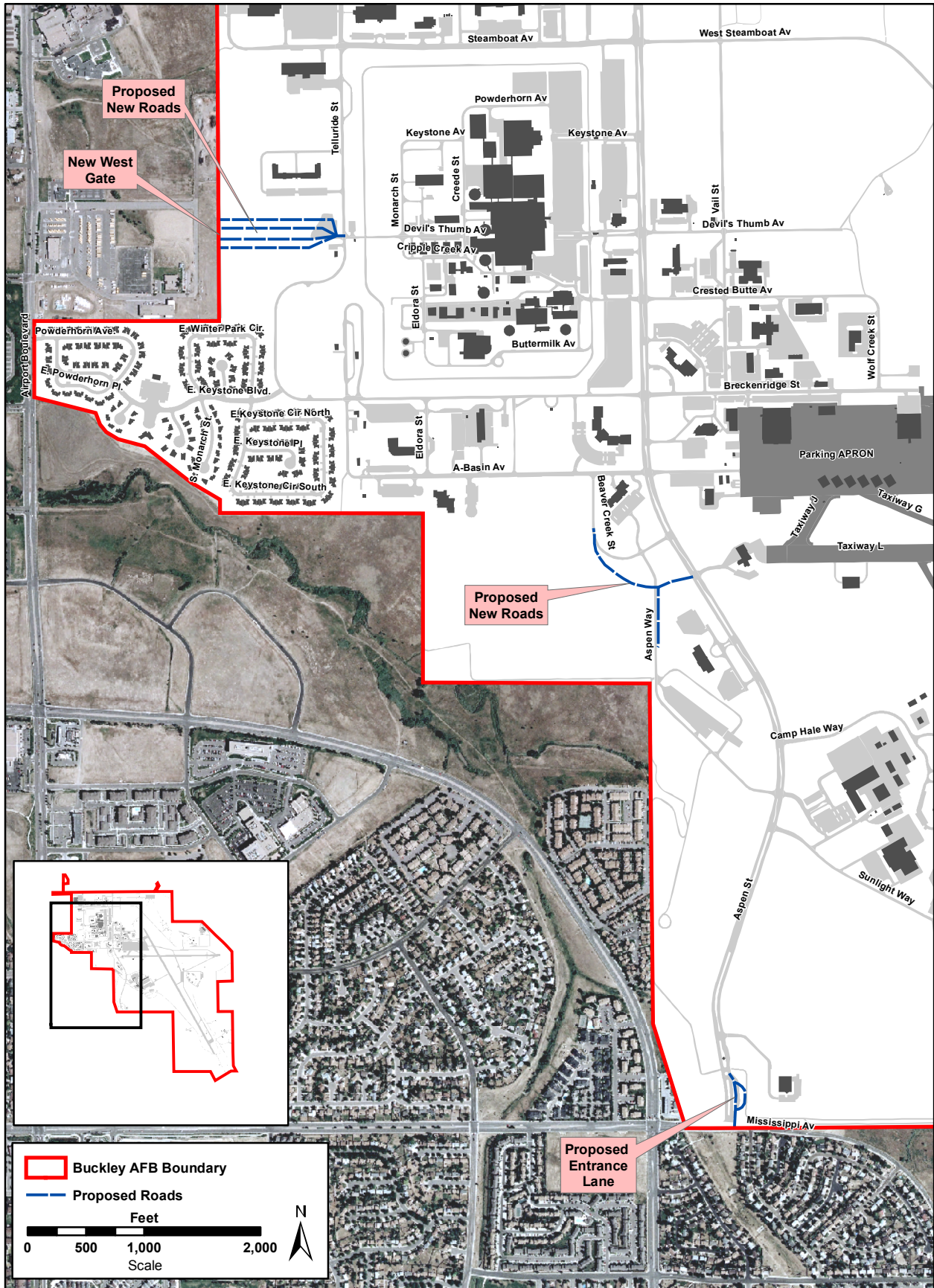
Table 4-9. Traffic Impacts of Future Buckley Projects

Proposed Land Use	Trip Generation (Vehicle-Trips)		
	New Trips Daily	New Trips Morning Peak Hour	New Trips Evening Peak Hour
ADP-1: Privatized Housing ^a	3,451	275	371
ADP-2: Entry Gates ^a	1,564	131	164
ADP 3: Dormitory ^a	4,290	321	441
ADP 4: Aspen Corridor ^a	786	104	123
ADP 5: Community Center ^a	3,336	269	398
ADP 6: Industrial Support ^a	1,217	161	181
ADP 7: Headquarters Area ^a	3,967	121	105
ADP 8: Williams Lake ^a	1,347	178	236
CF ^b	2,320	430	2,339
2005 BRAC Commission Actions (The Proposed Action)	2,656	384	368
TOTAL (New Trips)	24,934	2,374	4,726

Notes:

^a A more detailed description of each ADP project is available in chapter 2 of the Final CIP EA.

^b The CF at ADF trip generation estimate is based on 700 new employees.



Source of Proposed Roads: Buckley AFB 2007

Figure 4-1. Proposed Gate and Roads at Buckley AFB

Projected Buckley AFB traffic counts were derived from trip generation estimates for each Area Development Plan (ADP) listed in Appendix G of the Capital Improvement Projects EA. These projects were estimated to generate about 24,934 new daily vehicle-trips with about 2,374 occurring in the morning peak hour and about 4,726 occurring in the evening peak hour. However, not all projects included in the Appendix G of the Capital Improvement Projects EA are accounted for in traffic count data in **Table 4-10**. Many planned projects (see **Appendix C** for a current list of Capital Improvement Projects) have an unknown number of personnel associated with them and therefore traffic counts are not possible at this time.

Table 4-10. Daily Traffic Volume Cumulative Impacts – Alternative A

Roadway Name	Existing Daily Traffic	Projected Daily Traffic	Percentage Increase
6th Avenue – West of Main Gate	19,900	34,730	75%
6th Avenue – East of Main Gate	10,100	26,400	161%
Mississippi Avenue – West of Gate	14,600	22,500	54%
Aspen Street – North of Mississippi Gate	6,200	13,400	116%
Aspen Street – South of Main Gate	6,000	12,300	105%
Aspen Street – Between Steamboat and Breckenridge Avenues	3,000	12,400	313%
West Gate Access	NA	10,500	NA
Steamboat Avenue	1,000	8,900	790%
Breckenridge Avenue	1,000	8,800	780%

As shown in **Table 4-10**, the cumulative daily volumes on 6th Avenue are about 34,700 vpd west of the gate and about 26,400 vpd east of the gate. Mississippi Avenue cumulative daily volumes increase to around 22,500 vpd west of the gate. Along Aspen Street, the cumulative impacts of all projects increase daily volumes to between 12,000 and 13,400 vpd. At the West Gate daily volumes are estimated at 10,500 vpd. Along Steamboat and Breckenridge Avenues daily traffic volumes are estimated at about 9,000 vpd.

Table 4-10 provides a comparison of existing daily traffic volumes on roadways to the projected cumulative traffic volumes. Major increases are expected along most roadways, with the volume on Aspen Street at the 6th and Mississippi Gates projected to more than double. Major increases are expected along Aspen, Breckenridge, and Steamboat avenues primarily due to projected increases from projects identified in the Capital Improvements EA and the proposed CF at the ADF.

Table 4-11 provides LOS at the Buckley AFB intersections with 6th Avenue and Mississippi Avenue, and at the proposed new gate on Airport Boulevard. The LOS designations given in **Table 4-11** reflect the LOS for each movement group and for the overall intersection. In general, for urban areas, acceptable LOS for the overall intersection is LOS D; however, the same standard of acceptability is typically not applied to individual turn movements which can operate at a lower LOS. The operational analysis assumed additional intersection through lanes and turn lanes to reasonably accommodate the projected turn movements. However, the operational analysis did not assume additional turn lanes in and out of Buckley AFB.

Table 4-11. Intersection Level of Service and Delay Cumulative Impacts

Intersection	Morning Peak Hour			Evening Peak Hour		
	Existing LOS and Delay (sec./veh.)	Projected LOS and Delay (sec./veh.)	Percent Change in Delay	Existing LOS and Delay (sec./veh.)	Projected LOS and Delay (sec./veh.)	Percent Change in Delay
6th Avenue	LOS B 16.4	LOS C 29.1	77%	LOS C 29.0	LOS E 59.9	107%
Mississippi Avenue	LOS D 51.2	LOS C 31.7	-38%	LOS B 19.4	LOS C 23.9	23%
Airport Boulevard	NA	LOS B 19.8	NA	NA	LOS C 29.9	NA

As shown in **Table 4-11**, base intersections operate at LOS C or better during the peak hours except at the 6th Avenue intersection with the Main Gate and the intersection of Mississippi Avenue and Aspen Street. As mentioned, LOS D is considered an acceptable LOS in urban areas and to address the LOS E conditions, additional left-turn lanes in and out of Buckley AFB would improve intersection operations to LOS D. **Figure 4-2** shows cumulative traffic impacts on Buckley AFB

The cumulative impact of additional traffic coupled with intersection lane changes gives both an improvement and degradation in intersection LOS and delay at the existing Buckley AFB gate intersections with 6th Avenue and Mississippi Avenue. **Table 4-11** shows worse LOS and longer delays at 6th Avenue in both peak hours and at Mississippi Avenue in the evening peak hour. However, in the morning peak hour at Mississippi Avenue, the diversion of traffic to the new West Gate along with an additional through lane on Mississippi Avenue, improves LOS and delay from existing conditions.

At the 6th Avenue Main Gate, the projected 15-minute volumes only exceed the two-lane processing capacity in one 15-minute interval. At the Mississippi Gate, the 15-minute volumes between 6:15 and 7:30 a.m. either exceed or are nearly equal to the two-lane processing capacity. The West Gate has some additional processing capacity to accommodate excess vehicles that divert from the Mississippi Gate. However, during the period between 7:00 and 7:30 a.m., the peak 15-minute volume occurs and it appears there is not sufficient gate capacity at all gates to accommodate this peak inbound flow. Therefore, there could be long queues and delays during that 7:00 to 7:30 a.m. peak. However, it appears inbound flows drop significantly after 7:30 a.m. so the queues could dissipate quickly.

In conclusion, it appears that with the addition of a third base gate that the sum of the capacities at the three gates is sufficient to process the cumulative vehicle volumes entering the base during the morning peak periods.

In the future all base gates will have at least two lanes to allow vehicles to stack as IDs and decals are checked by base guards. Additional capacity from the proposed West Gate would accommodate vehicles that shift from the Mississippi Gate to avoid potentially long queues and delays.

Off-Base Traffic. Cumulative off-base traffic impacts would be long-term, adverse, and negligible. According to the DRCOG, the Denver Metropolitan Area will experience average yearly job growth at approximately 31,000 jobs per year between 2006 and 2030. By 2012, new personnel at Buckley AFB

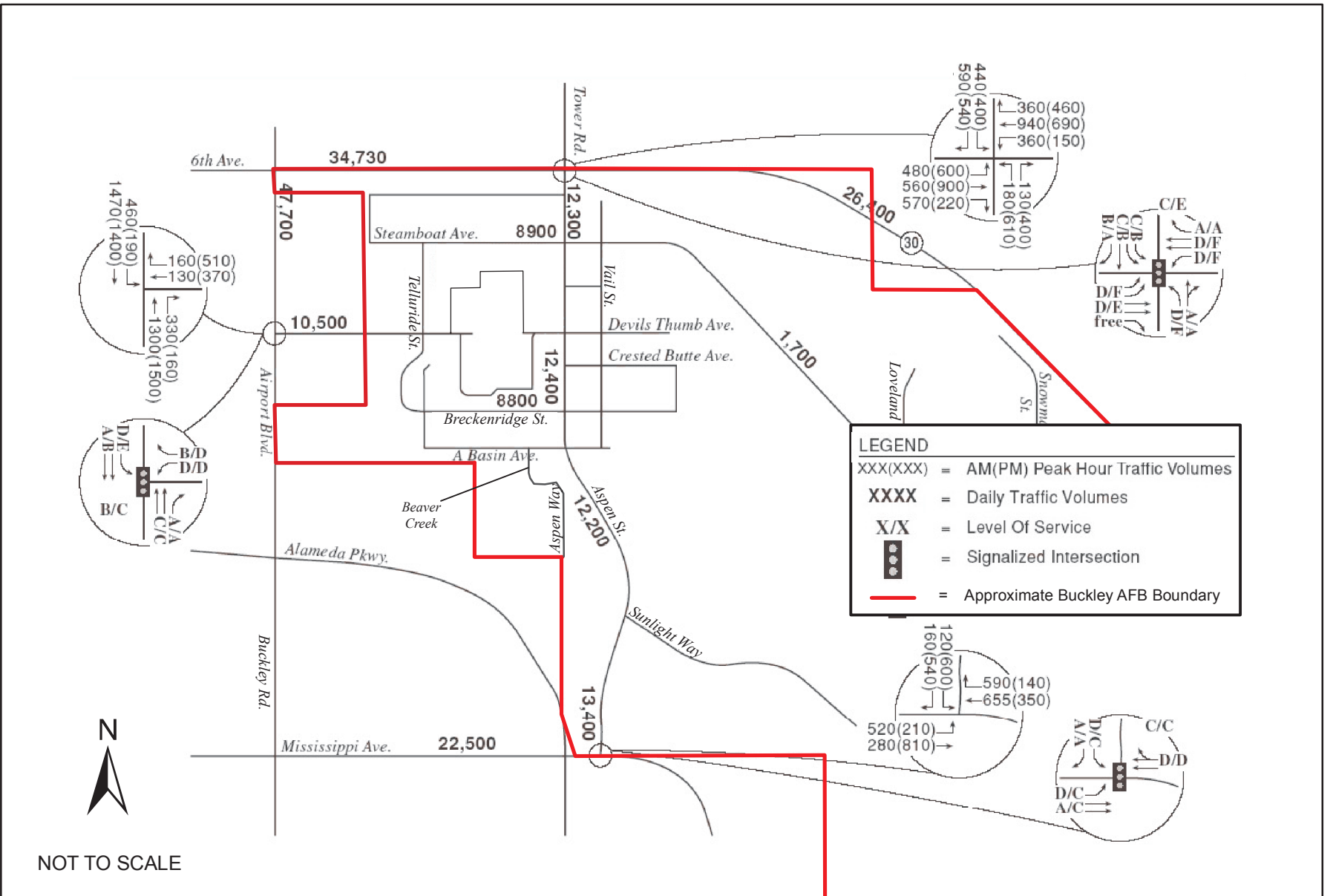


Figure 4-2. Cumulative Traffic Impacts

will lead to an increase in daily vehicle trips generated of 24,394. By comparison, the Denver Metropolitan Area will experience an increase in daily vehicle trips of about 514,600. Therefore, increased vehicle trips generated by increased jobs at Buckley AFB through 2012 only account for 4.8 percent of the regional increase in vehicle trips expected to be generated in the Denver Metropolitan Area during this time.

4.11 Hazardous Materials and Wastes

Effects on HAZMATs and wastes were assessed by evaluating the following:

- Whether the Proposed Action or alternatives would lead to noncompliance with applicable Federal and state regulations, or increase the amounts generated or procured beyond current Buckley AFB waste management procedures and capacities
- The degree to which the Proposed Action or alternatives could cause worker, resident, or visitor exposure to HAZMATs or wastes
- Whether the Proposed Action or alternatives disturb an ERP site or create/contribute to an ERP site resulting in adverse effects on human health or the environment.

4.11.1 No Action Alternative

Impacts

There would be no impacts on hazardous materials and wastes under the No Action Alternative because the proposed facilities, infrastructure upgrades, gate construction and improvements, and personnel would not be implemented.

Cumulative Impacts

No cumulative impacts on hazardous materials and wastes would result from the implementation of the No Action Alternative.

4.11.2 Alternative A: Proposed Action

Impacts

Hazardous Materials. No impacts on HAZMAT management during construction would be expected. Products containing HAZMATs would be procured and used during the proposed facilities construction projects in accordance with practices established at Buckley AFB and their HAZMART. Contractors would be responsible for the management of HAZMAT, which would be handled in accordance with Federal and state regulations. Contractors must report use of HAZMAT to the HAZMART including pertinent information (e.g., MSDS). There would be no new chemicals or toxic substances used or stored at Buckley AFB. It is anticipated that the quantity of products containing HAZMATs used during the construction activities would be minimal and their use would be of short duration. There would be no requirement to change the small generator status of Buckley AFB. The existing electrical system is considered PCB-free; the expansion to the electrical systems to support the additional personnel would remain PCB-free. Although, the additional F-16 aircraft would be used as back-up aircraft, they would require minimal maintenance while on stand-by. This maintenance would result in minimal increase in hazardous materials such as lubricants. Facility operations would generate the typical administrative/office hazardous materials such as toner, inks, lubricants, cleaning supplies, etc. The

increase of hazardous materials would not be adverse, would be minimal, and would be controlled by the HAZMART. Although the USAF has a policy that contractors shall not introduce ACM materials in construction projects there is the potential for ACM contaminated soils to impact the proposed projects. If ACM is discovered during site work, it would be removed according to Federal, state, and local regulations. Soil sampling would be utilized to ensure that soil is clean prior to construction starting.

The majority of the personnel functions being added through BRAC would be administrative in nature and would not require the use of HAZMAT except for supplies and materials involving office activities, the new medical squadron facility, and aircraft operations.

Hazardous Waste. Short- and long-term minor adverse effects on the base's hazardous waste management program could be expected from the construction or operational activities. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be minor. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, as well as the base's HWMP during construction. BMPs would be followed to ensure that contamination from a spill does not occur. Although, the additional F-16 aircraft would be used as back-up aircraft, they would generate minimal maintenance waste products while on stand-by. This maintenance would result in minimal increase in hazardous waste such as lubricants. No new waste stream would be required. Universal waste that would be generated by the administrative/office facilities would be minimal and would be handled in the same manner as all hazardous waste on Buckley AFB. There would be a slight increase in universal wastes due to the increase in facilities, personnel, and aircraft maintenance. The medical facility would generate small amounts of biohazard waste which would be disposed of in the same manner as existing Buckley AFB medical waste. Biohazardous waste generated at Buckley AFB is disposed of by a licensed contractor.

Storage Tanks. No effects on the base's fuel or water storage tanks would be expected. The Proposed Action would not involve the removal or addition of any storage tanks. The area proposed for Project No. 1 is adjacent to the new consolidated fuels area; consequently, construction at Project 1 should take into consideration ground disturbance as pipelines and storage tanks are associated with the consolidated fuel storage area.

Pollution Prevention. No effect on pollution prevention at Buckley AFB would be expected. Quantities of HAZMAT and chemical purchases, off-base transport of hazardous waste, disposal of MSW, and energy consumption would increase during construction. Operation of the new facilities would require procurement of products containing HAZMATs, generation of hazardous waste, and consumption of energy consistent with the baseline condition associated with the operation of the proposed facilities. Also, it is USAF policy to follow Green Procurement requirements (construction and office supplies) with the highest recyclable content possible and adhere to sustainable practices. Adherence to USAF guidelines on energy efficiency and conservation as well as plans and programs established at Buckley AFB would ensure that pollution prevention goals are met.

Environmental Restoration Program/Military Munitions Response Program. Short-term negligible adverse impacts would be expected from the construction of a gate if remediation of the suspect area is planned. For all projects lying close to or in an ERP/MMRP site, proper delineation and remediation, if warranted, should be completed prior to ground disturbance. Project Nos. 6 and 9 are adjacent to the MMRP site which is the Former Skeet Range. Project No. 8 is contained within the MMRP site which is the Chemical Warfare Area. If appropriate measures are taken to avoid or remediate these areas then there would be no effects expected. Prior to the initiation of the construction, clearance and approval from 460 CES/CEV should be obtained.

Ordnance. No effect on ordnance is expected. Firearms, ammunition, and ordnance would remain consistent with baseline usage and would be kept in locked storage or the munitions storage area. There would be a slight increase over existing quantities; however, the types of munitions used would remain consistent with existing use.

Cumulative Impacts

Hazardous Materials. The cumulative use of HAZMAT 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 minimize any effects from them. As stated previously, the USAF adheres to sustainable building practices. These practices generally use materials which are less hazardous. For future construction projects Buckley AFB would implement fewer HAZMAT as replacement materials become available. Cumulative impacts from the use of HAZMAT in construction and demolition activities on-base combined with off-base would depend on the quantity and nature of the materials used, both of which are unknown. The use of BMPs and adherence to all Federal, state, and local regulations would minimize the cumulative effects from their use.

No cumulative impacts on the surrounding area from the Proposed Action would be expected as the generation of HAZMAT is minimal and would not affect HAZMAT processing in Arapahoe County.

Hazardous Waste. No cumulative impacts on Hazardous Waste from the Proposed Action in the surrounding area would be expected as the generation of Hazardous Waste is minimal and would not affect HAZMAT processing in Arapahoe County. 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 mitigate 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 minimized through proper disposal and BMPs. Cumulative impacts from the generation of hazardous wastes account for wastes from on-base activities in combination with off-base activities. The amount of hazardous waste would be higher at times of construction. Hazardous wastes generated by construction activities would be disposed of by the contractor. Wastes from new facility operations (i.e., universal and biohazard) would be expected to increase slightly and would be disposed of through Buckley AFB's HWMP. The quantity and nature of the wastes generated on a cumulative basis are unknown (BAFB 2006e). Similar to HAZMAT, the implementation of appropriate BMPs and adherence to all Federal, state, and local regulations would minimize the cumulative effects from their generation.

No cumulative impacts on the surrounding area from the Proposed Action would be expected as the generation of HAZMAT is minimal and would not affect HAZMAT processing in Arapahoe County.

Storage Tanks. There would be no contribution to cumulative effect on storage tanks as result of the Proposed Action. No new storage tanks would be installed on the base as a result of the Proposed Action.

Pollution Prevention. There would no contribution to cumulative effects on the surrounding area as a result of the Proposed Action. On-base pollution prevention would have a short-term minor beneficial impact on the surrounding area as less raw material would be used and therefore would generate less waste or runoff from construction activities on Buckley AFB (BAFB 2006a). Therefore the use of pollution prevention techniques would have a beneficial impact when compared to implementing the same projects without consideration for pollution prevention (BAFB 2006a).

Environmental Restoration Program. No cumulative impacts on ERP sites on-base would be expected. It is not expected that the Proposed Action and other projects would negatively affect the ERP sites at

Buckley AFB, nor is it expected that any of these projects would result in the creation of a new ERP site. However, with the amount of demolition and construction activities along with the operational changes, the probability of an event, such as a spill, does increase. Adherence to management plans at Buckley AFB does minimize this probability and could also decrease the impact if a spill were to happen.

4.12 Unavoidable Adverse Impacts

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

Geological Resources. Under the Proposed Action, construction activities, such as grading, excavating, and trenching of the ground, would result in some minor soil disturbance. Implementation of BMPs during construction would limit environmental consequences resulting from construction activities. Standard erosion-control means would also reduce environmental consequences related to these characteristics. Although unavoidable, impacts on soils at the base are not considered significant.

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

Energy Resources. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. The use of nonrenewable resources in construction activities, and subsequently with the operations of facilities, is not considered significant.

Air Quality. Implementation of the Proposed Action or alternatives would result in temporary particulate emissions due to demolition, construction, or operations. Although unavoidable, the results of the impact analysis indicate that impacts would not be significant.

Traffic. 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 considered to be minor.

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

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Buckley AFB. Construction of the new facilities, West Gate, roads, utilities, and Mississippi Gate improvements would not result in any incompatible land uses on- or off-base. The proposed locations of these facilities and improvements were selected according to existing land use zones. Consequently, construction would not conflict with base land use policies or objectives. The Proposed Action would not conflict with any applicable off-base land use ordinances or designated clear zones.

4.14 Relationship Between the Short-term Use of the Environment 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 environment include those impacts that occur 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.

All of the project sites for the Proposed Action are located in conjunction with existing Buckley AFB development. None of the sites are environmentally sensitive or provide high quality habitat. Development of these sites contributes to long-term productivity by logically collocating or concentrating development.

4.15 Irreversible and Irrecoverable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material and biological resources and the irretrievable loss of human and energy resources. The use of these resources is considered to be permanent. 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 use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the Proposed Action.

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

Energy Resources. Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operations, gasoline would be used for the operation of private- and government-owned vehicles. There would be a slight increase in the use of electricity from operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no major impacts would be expected.

Biological Resources. The Proposed Action would result in minimal, irreversible loss of vegetation and wildlife habitat on the proposed construction sites and project areas.

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 LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA

Appendix A

Related Laws, Regulations, and Executive Orders

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, regulations, as well as Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

Noise

The 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 U.S. Air Force (USAF) installations.

Land Use

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 U.S. Department of Housing and Urban Development (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.

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 (NAAQSs) 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.

The General Conformity Rule requires all Federal actions that take place in areas designated as nonattainment with respect to ozone, carbon monoxide, and particulate matter must not emit levels of the nonattainment material that exceed the established *de minimis* levels.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. A Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations for actions in attainment areas, or New Source Review (NSR) requirements for non-attainment areas.

Safety

AFI 91-202, USAF Mishap Prevention Program, implements Air Force Policy Directive (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. This instruction applies to all USAF personnel.

AFI 91-301, Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program, implements 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. This instruction applies to all USAF activities.

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.

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. 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. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.

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. In such cases, agencies must follow the Federal Emergency Management Agency's 8-step process for siting in a floodplain.

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 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, deliver, or cause to be shipped, exported, imported, transported, carried, or receive any migratory bird, part, nest, egg, or product, manufactured or not.

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).

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 made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. Federal agencies are responsible for evaluating their actions and policies, in consultation with American Indian groups, to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans.

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.

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). 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.

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. 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 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 disproportionate adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agency wide environmental justice strategies.

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.

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 that promotes 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 in 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 decision making 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.

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.”

The Toxic Substance Control Act (TSCA) of 1976 establishes requirements for identification and control of toxic chemicals to include polychlorinated biphenyls (PCBs), asbestos containing materials (ACM), indoor radon, and lead exposure. TSCA also provides statutory framework for “Hazard Emergency Response.”

40 CFR Part 112 includes requirements for Spill Prevention, Control, and Countermeasure (SPCC) Plans, and for Facility Response Plans (FRPs). The final rule includes subparts outlining the requirements for various classes of oil; the applicability of the regulation; and the requirements for completing SPCC Plans. AFI 32-7044 describes the environmental and engineering requirements for underground and aboveground storage tanks and associated piping that store petroleum and hazardous substances.

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APPENDIX B

**NOTICE OF AVAILABILITY AND AFFIDAVIT OF PUBLICATION INTERAGENCY AND
INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING MATERIALS**



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

Bruce James
460th Civil Engineer Squadron
660 South Aspen Street, Stop 86
Buckley AFB CO 80011-9551

MAR 10 2008

Georgianna Contiguglia
State Historic Preservation Officer
Colorado History Museum
1300 Broadway
Denver CO 80203-2137

Dear Ms. Contiguglia

Buckley Air Force Base (AFB) and the U.S. Air Force (USAF) are preparing an Environmental Assessment (EA) for the proposed construction of facilities and associated infrastructure, construct and improve roads, and upgrade utilities necessary to accommodate the recommendations of the 8 September 2005 Defense Base Closure and Realignment Commission (hereinafter referred to as "2005 BRAC Commission") affecting Buckley AFB, Colorado. The Proposed Action includes constructing new facilities and associated infrastructure, expanding and realigning Aspen Way with Beaver Creek and Aspen Street, upgrading the Mississippi Gate, constructing a new West Gate, adding approximately 800 personnel to the base, and accommodating the addition of three back-up F-16 aircraft for the 140th Fighter Wing (140 WG). The No Action Alternative would not satisfy the law's requirements and does not meet the project purpose and need.

In compliance with Section 106 of the National Historic Preservation Act, Buckley Air Force Base is officially requesting consultation on this project. The 460th Space Wing (SW) has determined that the proposed action, and alternatives, would not have an adverse affect on historic properties. Cultural resources on Buckley AFB have been inventoried and analyzed for historic significance (Historic Building Inventory and Evaluation dated June 2004). No known archaeological resources or historic structure are in, or near, the Area of Potential Effect (APE). Attached are maps referencing the buildings and proposed sites.

Proposed Action Sites:

- Consolidated Training and Storage Building (Project 1) – Buildings 1001, 1022, 1024, and 1025 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- Communications Building (Project 2) – Buildings 630 (5AH2306) (1973) and 730 (5AH2307) (1987) were constructed after 1970. Therefore, they are not eligible for inclusion on the National Register of Historic Places. Buildings 631, 725 and 731 were

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constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.

- Medical Building (Project 3) – Buildings 600, 602, and 805 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- Civil Engineering Building (Project 4) – Buildings 1003, 1005, and 1032 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- Security Forces Building (Project 5) – Buildings 805 and 806 Buildings 602, 1030, and 1032 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- ARPC Administrative Building (Project 6) – Buildings 602, 1030, and 1032 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- Group Headquarters (Project 7) - Buildings 602, 1030, and 1032 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- West Gate (Project 8) - Buildings 205, 210, and 450 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- Mississippi Gate (Project 8) – Buildings 1550 and 1552 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.
- Aspen Way Realignment (Project 9) – Buildings 600, 602, 806, and 1030 Buildings 602, 1030, and 1032 were constructed after 1990. Therefore, they are not eligible for inclusion on the National Register of Historic Places.

Please provide written comments and/or concurrence to:

Floyd W. Hatch
460 CES/CEVP
660 S. Aspen Street, Mail Stop 86
Buckley AFB CO 80011-9551

If you have any questions please feel free to contact Mr. Floyd Hatch, Cultural Resources Manager 720-847-6937, email floyd.hatch@buckley.af.mil or Mr. Bruce James, Environmental Conservation and Planning Section Chief at 720-847-7245, email bruce.james@buckley.af.mil.

A copy of the Draft 2005 Base Closure and Realignment Actions Environmental Assessment will be sent for your review in the near future.


Sincerely

A handwritten signature in blue ink that reads "Bruce James". The signature is written in a cursive style with a large initial "B".

BRUCE JAMES, YF-02
Chief, Environmental Conservation & Planning
Section

Attachment
Location figures



 OFFICE of ARCHAEOLOGY and HISTORIC PRESERVATION

March 21, 2008

Bruce James
Chief, Environmental Conservation & Planning Section
460th Civil Engineer Squadron
660 South Aspen Street, Stop 86
Buckley AFB CO 80011-9551

Re: Environmental Assessment for the proposed construction of facilities and associated infrastructure, construct and improve roads, and upgrade utilities. (CHS #52045)

Dear Mr. James:

Thank you for your correspondence dated March 10, 2008 and received by our office on March 13, 2008 regarding the review of the above-mentioned project under Section 106 of the National Historic Preservation Act (Section 106).


After review of the provided information, we concur that there are no properties eligible for the National Register of Historic Places within the Area of Potential Effects (APE). After review of the Assessment of Adverse Effects, we concur with the finding of *no historic properties affected* [36 CFR 800.4(d)(1)] under Section 106 for the proposed undertaking.

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 CFR 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 Coordinator, at (303) 866-4678.

Sincerely,

For 
Georgianna Contiguglia
State Historic Preservation Officer

cc: Floyd Hatch/Buckley AFB

COLORADO HISTORICAL SOCIETY

1300 BROADWAY DENVER COLORADO 80203 TEL 303/866-3395 FAX 303/866-2711 www.coloradohistory-oahp.org



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado History Museum
1300 Broadway
Denver, CO 80303-2137

Dear Ms. Contiguglia,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

The public comment period for this EA is 30 days. Please provide any written comments by 5pm on 19 May 2008 to:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Mr. John Fernandez
City of Aurora
Planning, Environmental Division
15151 E. Alameda Pkwy.
Aurora, CO 80012

Dear Mr. Fernandez,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Mr. Rosenlund,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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Buckley AFB, CO 80011-9551

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BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

APR 16 2008

Mr. Larry Svoboda
NEPA Unit Chief
U.S. Environmental Protection Agency
Region 8
999 18th Street, Suite 500
Denver, CO 80202

Dear Mr. Svoboda,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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660 South Aspen Street, Stop 86
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Buckley AFB, CO 80011-9551

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BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

APR 16 2008

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

Dear Mr. Watkins,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Mr. Bibles,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

The public comment period for this EA is 30 days. Please provide any written comments by 5pm on 19 May 2008 to:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

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BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Ms. Cynthia Holdeman
Government Publications
Denver Public Library
10 W. Fourteenth Ave. Pkwy
Denver, CO 80526

Dear Ms. Holdeman,

The Air Force is pleased to provide the Denver Public Library a review copy of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for the 2005 Base Closure and Realignment Actions proposed for Buckley Air Force Base (AFB), Colorado. We appreciate the Denver Public Library's contribution in making this document available to the public for review and comment.

Public reviewers are asked to submit written comments (referencing Section, page and line numbers to which comments apply) to the following address:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Buckley AFB, CO 80011-9551

The public comment period for this EA is 30 days. Public reviewers are asked to submit any written comments by 5pm on 19 May 2008.

If you have any questions please feel free to contact Elizabeth Meyer at the address above.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Ms. Foreman,

The Air Force is pleased to provide the Aurora Public Library a review copy of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for the 2005 Base Closure and Realignment Actions proposed for Buckley Air Force Base (AFB), Colorado. We appreciate the Aurora Public Library's contribution in making this document available to the public for review and comment.

Public reviewers are asked to submit written comments (referencing Section, page and line numbers to which comments apply) to the following address:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Buckley AFB, CO 80011-9551

The public comment period for this EA is 30 days. Public reviewers are asked to submit any written comments by 5pm on 19 May 2008.

If you have any questions please feel free to contact Elizabeth Meyer at the address above.

A handwritten signature in blue ink that reads "Bruce James".

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Ms. Gina Sciosca
Boulder Public Library
1000 Canyon Blvd.
Boulder, CO 80302

Dear Ms. Sciosca,

The Air Force is pleased to provide the Boulder Public Library a review copy of the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for the 2005 Base Closure and Realignment Actions proposed for Buckley Air Force Base (AFB), Colorado. We appreciate the Boulder Public Library's contribution in making this document available to the public for review and comment.

Public reviewers are asked to submit written comments (referencing Section, page and line numbers to which comments apply) to the following address:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Buckley AFB, CO 80011-9551

The public comment period for this EA is 30 days. Public reviewers are asked to submit any written comments by 5pm on 19 May 2008.

If you have any questions please feel free to contact Elizabeth Meyer at the address above.

A handwritten signature in blue ink that reads "Bruce James".

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

APR 16 2008

Mr. Jim Paulmeno
Manager, Environmental Planning
Colorado Dept. of Transportation
4201 East Arkansas Ave.
Denver, CO 80222

Dear Mr. Paulmeno,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

The public comment period for this EA is 30 days. Please provide any written comments by 5pm on 19 May 2008 to:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Ms. Moore,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

The public comment period for this EA is 30 days. Please provide any written comments by 5pm on 19 May 2008 to:

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Mr. Beley,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Ms. Chick,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

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

Dear Mr. Ed LaRock,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Mr. Mac Callison
City of Aurora
Planning, Traffic Division
1515 E. Alameda Pkwy.
Aurora, CO 80012

Dear Mr. Callison,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Ms. Jane Hann
Environmental Project Manager
Colorado Dept. of Transportation
4201 East Arkansas Avenue
Denver, CO 80222

Dear Ms. Hann,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Realignment and Closure Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Mr. Eugene Jansak
Industrial Waste Specialist
Metro Wastewater Reclamation District
6450 York Street
Denver, CO 80229-7499

Dear Mr. Jansak,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER



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

APR 16 2008

Mr. Bruce James
Environmental Flight
460th Civil Engineering Squadron
660 South Aspen Street
Buckley AFB, CO 80011-9551

Ms. Patricia Mehlhop
U.S. Fish and Wildlife Service
134 Union Blvd., Suite 645
Lakewood, CO 80228-1807

Dear Ms. Mehlhop,

The Air Force has prepared a Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Draft Finding of No Practical Alternative (FONPA) for 2005 Base Closure and Realignment Actions (BRAC) proposed for Buckley Air Force Base (AFB), Colorado. Under the Proposed Action, construction of new facilities at Buckley AFB; associated infrastructure improvements; a new West Gate; upgrades to the Mississippi Gate; and the reassignment of three back-up F-16 aircraft. In addition, there would be an increase of approximately 800 personnel assigned to Buckley AFB from the 926th Fighter Wing and the Air Reserve Personnel Center (ARPC) Buckley Annex. The Proposed Action is needed to comply with the 2005 BRAC law.

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Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street, Stop 86
Building 1005, Room 178
Buckley AFB, CO 80011-9551

If you have any questions please feel free to contact Elizabeth Meyer at 720-847-7159, or via e-mail: elizabeth.meyer@buckley.af.mil.

A handwritten signature in blue ink that reads "Bruce James".

BRUCE JAMES
Chief, Environmental Planning & Conservation

GUARDIANS OF THE HIGH FRONTIER

STATE OF COLORADO

Bill Ritter, Jr., Governor
James B. Martin, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
TDD Line (303) 691-7700 (303) 692-3090
Located in Glendale, Colorado
<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

April 22, 2008

Ms. Elizabeth Meyer
460 CES/CEV
660 South Aspen Street (Stop 86)
Building 1005, Room 178
Buckley AFB, CO 80011-9551

Dear Ms. Meyer:

Re: Draft Environmental Assessment (EA) of 2005 Base Realignment Actions at Buckley Air Force Base, Colorado, dated April 2008

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (the Division) has reviewed the above referenced document received April 18, 2008. The Division's comments follow:

- 1) Section 1.6.3, Resource Topics Eliminated From Detailed Study, Safety and UXO, page 1-7 – Despite the title of this section, there is no discussion of UXO. Since several MMRP sites with potential for UXO are discussed later in the EA, UXO should be removed from the section title.
- 2) Section 3.1.1, Hazardous Materials and Wastes, Environmental Restoration Program/ Military Munitions Response Program, page 3-26 – a) Although ACM is listed on page 3-23, discussion should be added on potential impact of ACM soils on the projects. b) It appears that perhaps project 9, and not project 5, is near the Apron Runoff AOC and closed ERP Site 6. c) Location of ERP site 11 should be available from the Final EE/Ca dated April 2008. d) Per page 2-5, the new West Gate is scheduled for construction on FY08. How will this be coordinated with MMRP work at the Chemical Warfare Training Area?

Please contact me at 303-692-3324 or ed.larock@state.co.us if there are any questions.

Sincerely,

Ed LaRock, P.G.
Environmental Protection Specialist
Hazardous Materials and Waste
Management Division

cc: Richard Lotz, AGO
Mark Spangler, Buckley Air Force Base
David Rathke, EPA Region 8
File D003-1.1



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

MAY 23 2008

Bruce James
Environmental Flight, 460th Civil Engineer Squadron
660 S. Aspen St., Stop 86
Buckley AFB, CO 80011-9551

Ed LaRock
Hazardous Materials and Waste Management Division
Colorado Dept. of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Mr. LaRock

Thank you for your letter, dated 22 April 2008, on the 2005 Base Closure and Realignment Actions (BRAC) Environmental Assessment (EA) and Finding of No Significant Impact (FONSI).

Section 1.6.3 will be revised to remove the reference to UXO. Additional text will be added to Section 3.1.1 to address potential impacts of ACM soils on the projects. Section 3.11 will be revised so that Project 9 is near the Apron Runoff AOC and the closed ERP Site 6. The data for mapping Site 11 is not yet available to include in the EA. The existence of Site 11 was included in the text in Section 3.11. The reference to Table 2-1, the West Gate, and Mississippi Gate improvements will be removed from the description of Project 9. The table will be referenced separately from any of the projects. The West Gate is not scheduled for construction until 2014 or later. Work at the MMRP site will be coordinated appropriately based on the schedules for both projects.

Please contact Ms. Elizabeth Meyer, NEPA Program Manager, at 720-847-7159 or elizabeth.meyer@buckley.af.mil, if you have any questions or require further information.

Sincerely

BRUCE JAMES, YF-2
Chief, Planning and Conservation

GUARDIANS OF THE HIGH FRONTIER

NOTICE OF AVAILABILITY AND AFFIDAVIT OF PUBLICATIONS

Page 8 | LIFE | Aurora Sentinel | April 17, 2008 - April 23, 2008

PUBLIC NOTICE

Notice of Availability Draft Finding of No Significant Impact/Finding of No Practicable Alternative for the Environmental Assessment of 2005 Base Closure and Realignment Actions at Buckley AFB, Colorado

An Environmental Assessment (EA) addressing the 2005 Base Closure and Realignment Commission (2005 BRAC Commission) actions that are coming to Buckley AFB is being prepared. Implementation of 2005 BRAC Commission actions include the construction of seven new facilities, associated infrastructure and utility improvements, Mississippi Gate upgrades, a new West Gate, the gain of approximately 800 personnel, and the addition of three back-up F-16 aircraft.

The 460th Space Wing is proposing to issue a Finding of No Significant Impact/Finding of No Practicable Alternative (FONSI/FONPA) based on the EA. The analysis considered in detail potential effects of the Proposed Action and the No Action Alternative on 11 resource areas: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, utilities, transportation/traffic, and hazardous materials and wastes. The results of the analysis in the EA indicate that the Proposed Action would not have a significant adverse impact on the environment, indicating that a FONSI/FONPA would be appropriate.

The comment period is open for 30 days following the publication of this notice in the Denver Post. Copies of the Draft EA and Draft FONSI/FONPA are available for review by the public at the Aurora Central Library, 14949 E. Alameda Parkway, Aurora, Colorado 80012; Denver Public Library, Government Documents Section, 10 West 14th Avenue, Denver, Colorado 80204; and at the Boulder Public Library, 1000 Canyon Blvd., Boulder, Colorado 80302. Copies can also be obtained by writing to Buckley AFB at the address provided below.

Comments or questions on the Draft EA and Draft FONSI/FONPA should be directed to Ms. Elizabeth Meyer, 460 CES/CEV, 660 S. Aspen Street (Stop 86), Bldg. 1005, Room 178, Buckley AFB, Colorado 80011-9551.

In addition, the following privacy advisory was published on the cover sheet of the Draft EA.

PRIVACY NOTICE

Your comments on this document are requested. Letters or other written comments provided may be published in the EA. Comments will normally be addressed in the EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed; personal home addresses and phone numbers will not be published in the EA.

The Denver Newspaper Agency
DENVER, CO

PUBLISHER'S AFFIDAVIT

City and County of Denver,
STATE OF COLORADO, SS.

Jean Birch

..... being of lawful
age and being first duly sworn upon oath, deposes and says:
Legal Advertising Reviewer

That he/she is the
Of The Denver Newspaper Agency, publisher of the Denver Post and
Rocky Mountain News, daily newspapers of general Circulation published
and printed in whole or in part in Denver, in the County of Denver and
State of Colorado, and that said newspaper was Prior to and during
all the time hereinafter mentioned duly qualified For the publication of
legal notices and advertisements within the Meaning of an Act of the
General Assembly of the State of Colorado,
Approved April 7, 1921, as amended and approved March 30, 1923;
And as amended and approved March 5, 1935, entitled "An Act
Concerning Legal Notices, Advertisements and Publications and the
Fees of printers and publishers thereof, and to repeal all acts and parts
Of acts in Conflict with the provision of this Act" and amendments
There to:

That the notice, of which the annexed is a true copy, was published in
The said newspaper to wit: (dates of publication)

..... April 20, 2008
Signature *Jean Birch*

Subscribed and sworn to before me this 19 day

Of ... May ... A.D. 2008.
Cheeryl L. Schmidt
Notary Public.

My commission expires September 9, 2009



PUBLIC NOTICE
Notice of Availability
Draft Finding of No Significant Impact/ Finding of
No Practicable Alternative for the Environmental
Assessment of 2005 Base Closure and Realignment
Actions at Buckley AFB, Colorado

An Environmental Assessment (EA) addressing the 2005 Base Closure and Realignment Commission (2005 BRAC Commission) actions that are coming to Buckley AFB is being prepared. The implementation of 2005 BRAC Commission actions include the construction of seven new facilities, associated infrastructure and utility improvements, Mississippi Gate upgrades, a new West Gate, the gain of approximately 800 personnel, and the addition of three back-up F-16 aircraft.

The 400th Space Wing is proposing to issue a Finding of No Significant Impact/ Finding of No Practicable Alternative (FONSI/FONPA) based on the EA. The analysis considered in detail potential effects of the Proposed Action and the No Action Alternative on 11 resource areas: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, utilities, transportation, traffic, and hazardous materials and wastes. The results of the analysis in the EA indicate that the Proposed Action would not have a significant adverse impact on the environment, indicating that a FONSI/FONPA would be appropriate.

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Comments or questions on the Draft EA and Draft FONSI/FONPA should be directed to Ms. Elizabeth Meyer, 460 CES/CEV, 600 S. Aspen Street (Stop 66) Bldg. 1005, Room 178, Buckley AFB, Colorado 80111-9551.

APPENDIX C

RECENT, CURRENT, AND PLANNED CAPITAL IMPROVEMENT PROJECTS AT BUCKLEY AFB

Appendix C
Recent, Current, and Planned Capital Improvement Projects

FY	Projects	Total Facility or Project Sq Ft (ft²)*
02	BX/Commissary	200,152
02	Telluride Gate	133
02	Construct New Gas Meter House	275
02	Fitness Center	75880
03	H-70 (Hydrazine) Fuel Storage Facility	178
03	Child Development Center 4 room Addition	743
03	Fire Station Addition	5500
03	Engine Shop Addition Bldg 960 (COANG)	450
03	Entomology (O&M) Replace Entomology Shop	2255
03	460 SW Headquarters	51066
03	Construct New Control Tower (COANG)	4949
03	Two Warehouses - Civil Engineering.	10000
03	Two Pavilions at Williams Lake	60
03	ADAL SBIRS Mission Control	3000
03	Golf Driving Range - Demolished	144
04	Dormitory II	57,528
04	Civil Engineering Complex (COANG)	17000
04	Fire Training Facility	
04	Military Family housing	126216
05	Chapel Center	22305
05	Child Development Center CDCII	21837
05	Medical Clinic ADAL	4563
05	Army Aviation Support Facility (COARNG)	120000
05	Install two temporary modulars for DSOC	33000
05	Visitor Center Addition and Parking	1000
06	Car Wash (AAFES) 4 bay	
06	Outdoor Rec Equip Rental (NAF)	9310
06	Haz Materials Storage (Env. Level 1) HAZMART Pharmacy	5457
06	Haz Waste Facility (Env. Level 1)	5457
06	Medical (Clinic) Warehouse	4000
07	Visitors Quarters	39568
07	Temporary Lodging Facility (NAF)	84377
07	Consolidated Services Facility Admin	3000
07	Youth Center (NAF)	5500
07	Squadron Ops Facility (COANG)	22950
07	Communications Center (ADAL 730)	10000
07	Alert Crew Quarters (COANG)	1100

FY	Projects	Total Facility or Project Sq Ft (ft²)*
07	Leadership Development Center	17631
07	Consolidated Fuels -POL Ops Building	2745
07	Consolidated Fuels- Storage Pol Bulk Ops Building	452
07	Consolidated Fuels -Pump house	1001
07	926th Security Forces Squadron	9376
07	Construct ADF Admin Facility	30000
07	Freight Transfer Facility	12000
07	Military Working Dog Kennel	3500
08	BITC Mailroom	4000
08	Athletic Fields Concession (NAF)	1399
09	Satellite Pharmacy	1000
10	Logistics Readiness Complex - now states in clear zone	35000
10	Bowling Center and Community Activities (Peterson)_	5274
11	Education Center/Library	4000
11	Arts, Crafts, Auto Skills Development Ctr	2000
11	Visitors Center (6th Ave)	1000
12	Fitness Center ADAL (estimate based on existing swimmint pool at Peterson AFB)	6000
12	SF Operations Facility -	35000
12	Vehicle Maintenance Facility - (joint COANG)	37717
12	ADF Consolidated Facility	644000
14	Fire/Crash Rescue Station	23000
15	ADAL Weapons Release Complex (ADAL COANG).	800
15	Consolidated Base Warehouse	50000
15	Small Arms Range Indoor Arm Range - indoor with outdoor grenade launcher	23735
15	6th Ave Entry Gate. Was'11	9528
15	Entry Control Facility (upgrade-was 08)	14391
15	Mississippi Entry Gate	9709
15	Telluride Entry Gate	6107
15	Weapons Loading Training Facility (COANG)	1500
16	Spaced Based Infrared (SBIR) Operational Support Facility	15000
16	Spaced Based Infrared (SBIR) Remote Ground Station.	6300
16	Dormitory 3 (96 PN)	40000
16	Upgrade Weapons Live Load Area (COANG)	10000
TBD	Expand Bldg 700 (COANG)	
03	Runway and Taxiway Additions	37500
03	Repair Runway, Taxiways, Ramps (COANG)	195000
04	ADD/Alter Access Roads (Airfield) (COANG)	443520
04	Approach Lighting (COANG)	672

FY	Projects	Total Facility or Project Sq Ft (ft²)*
04	East Restricted/Official Use Only Access Point	128
04	Repair Parking Lots ANG wide (COANG)	144000
04	Upgrade Base Infrastructure, Ph III	NA
04	Transportation System/Landscaping Aspen	1280000
04	New Dedicated Fire Mains	86000 linear feet disturbance
05	Athletic Fields (two ball fields, 1 track, and 1 football field)	Fence 3,600 meters
05	CDCII Pre-school Playground	8800
05	CDCII Pre-toddler Playground	5225
05	CDCII Toddler Playground	6450
05	Repair Taxiways A&K	Unknown at this time
05	Construct 2 SWS/MCS Force Protection	
05	Central Mall (Landscaping, sidewalks for ADP 5)	130000
06	Construct ADF Parking Lot at Former Mod-1 Location	3200
06	North Industrial Storm Water Retention Pond	435000
06	6th Avenue Deceleration Lanes	45000
06	Repair Parking Lot East of Bldg 471	316798
07	Repair Alert Taxiway L Pvts	
07	Repair Taxiway "M"	
08	Construct ADF Parking Lot at Former Mod-2 Location	3500
08	FAMCAMP - RV Parking Sites 38, Tent Sites 10 each	58100
08	Youth Baseball Field	
09	Highspeed Taxiway	844500
09	Impound Lot (asphalt paved)	8000
09	RV Storage Lot (ADAL)	621075
09	Vail Street Improvements	91200
10	Youth Soccer Field	250000
10	Youth Softball Field	250000
11	West Parking Lot	
14	Adult Softball Field	
14	North Runway Extension (Construct, COANG)	536274
15	South Runway Repair (COANG)	538704
15	Upgrade Based Infrastructure Ph IV.	Unknown at this time
16	East Parking Apron Relocation (COANG).	362700
16	Taxiway and Arm/Disarm (COANG) Includes Demoliton of existing parking apron and protion of Sunlight Road and taxiways F, W, X, and Y.	75 feet by 10,500 linear feet and holding pads 225 feet by 400 LF (paved)
20	Widen 6th Avenue from Airprt Blvd to 6th Avenue Gate	528000
TBD	Realign Steamboat	270000
TBD	Relocate jogging trail	3,800 linear feet

FY	Projects	Total Facility or Project Sq Ft (ft²)*
TBD	Williams Lake Core Area, picnic shelters, and sites	6000
TBD	Williams Lake Playground	
TBD	Williams Lake tent camping area	
TBD	New Munitions and Hazardous Materials Gate (East Gate)	15000
02	Demolish existing ballfields	800
02	Demolish Winter Park Street and Parking lot west of dormitory 1	50000
03	Demolish Building 25	12000
04	Remove Temporary Modular Building - Mod 3	20000
04	Demolish Gas Meter House	378
04	Demolish street and parking lot in vicinity of building 28 and portions of Beaver Creek	40000
05	Remove Temporary Modular Building - Mod 1	20000
05	Demolish Building 19 (Camana Club)	7132
05	Demolish Warehouse (1011/1012)	22949
05	Demolition of roads and parking lot adjacent to Bulding 600 (Beaver Creek)	40000
06	Demolish Pump Station/Other Structures	264
07	Demolish Crash House (1606)	8327
07	Demolish Fuels Admin (302)	1185
08	Remove Temporary Modular Building - Mod 2	20000
08	Consolidated Fuels - Demolish Bulding 341	216
09	Demolish Building 31	204
09	Demolish Building 902 Originally 05 project, then '08 and possibly '09 if funded	4428
09	Demolish Fuel Storage (200) Constuction 07, if funded	1576
09	Demolish Fuel Tanker Stands Construction 07	
09	Demolish Fuels Lab (300) Construction 07,	1503
09	Demolish 344 hazardous materials/waste storage	160
09	Demolish Gas Mask Training Building	216
09	ARPC BRAC	86937
10	Demolish Range Supply and Equipment Storage	1500
10	Demolish Range Target Storage	600
10	Demolish Small Arms Range	
10	Demolish Building 950	20303
11	Demolish Building 940	14758
11	Demolish Visitors Center	783
12	Demolish Electrical Shop (1631)	3025
12	Demolish Engine Test Pad Originally FY07	2057
12	Demolish Hydrazine Bldg (310)	820
12	Demolish Marine Area Foundations	Unknown at this time

FY	Projects	Total Facility or Project Sq Ft (ft²)*
12	Demolish Radio Relay Bldg (1620)	1600
12	Demolish Reserve Forces Bldg (1632)	600
12	Demolish Space Operations Facility	
12	Demolish Space Operations Facility	
TBD	Demolish Working Dog Kennel	1629
TBD	Demolish Entomology Facility (306)	1160

Source: BAFB 2007f

Notes:

* Facility/Project footprint does not include disturbance due to construction, such as laydown areas, and generally does not include parking lots.

NA = Not Available

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APPENDIX D

AIR EMISSIONS CALCULATIONS

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust as well as painting.
Fugitive	Estimates fine particulate emissions from 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
Commuter Emissions	Estimates the total emissions from personally-owned vehicles from additional mission support personnel coming to Buckley AFB
Aircraft Emissions	Estimates the total emissions from baseline and proposed aircraft operations.
AQCR Tier Report	Summarizes total emissions for the Metropolitan Denver Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.

Air Quality Emissions from Proposed Action

	NO _x (ton)	VOC (ton)	CO (ton)	SO ₂ (ton)	PM ₁₀ (ton)
Construction Combustion	1.517	0.317	1.897	0.032	0.049
Construction Fugitive Dust	0.000	0.000	0.000	0.000	15.502
Commuter Emissions	125.080	146.230	1850.160	9.450	158.230
TOTAL CY2009	126.597	146.547	1852.057	9.482	173.781

CY2009

Air Quality Emissions from Proposed Action

	NO _x (ton)	VOC (ton)	CO (ton)	SO ₂ (ton)	PM ₁₀ (ton)
Construction Combustion	5.835	1.233	6.801	0.152	0.197
Construction Fugitive Dust	0.000	0.000	0.000	0.000	24.961
Commuter Emissions	125.080	146.230	1850.160	9.450	158.230
TOTAL CY2010	130.915	147.463	1856.961	9.602	183.388

CY2010

Since future year budgets were not readily available, actual 2001 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.

Metropolitan Denver Intrastate AQCR

Year	Point and Area Sources Combined				
	NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)
2001	113,946	101,293	816,914	39,750	72,846

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/geosel.html>). Site visited on 22 March 2007.

Determination Significance (Significance Threshold = 10%) for Construction Activities

Point and Area Sources Combined					
NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	
113,946	101,293	816,914	39,750	72,846	
126.597	146.547	1852.057	9.482	173.781	
0.111%	0.145%	0.227%	0.024%	0.239%	

Minimum - 2001
2009 Emissions
Proposed Action %

Point and Area Sources Combined					
NO _x (tpy)	VOC (tpy)	CO (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	
113,946	101,293	816,914	39,750	72,846	
130.915	147.463	1856.961	9.602	183.388	
0.115%	0.146%	0.227%	0.024%	0.252%	

Minimum - 2001
2010 Emissions
Proposed Action %

Construction Combustion Emissions for CY 2008

Combustion Emissions of VOC, NO_x, SO₂, CO and PM₁₀ Due to Construction

Includes:

1	100% of Construct Security Forces Squadron Facility	9,375 ft ²
2	100% of Grade Area for Security Forces Squadron Facility	54,863 ft ²
3	100% of Pave Parking Lot for Security Forces Squadron Facility	21,000 ft ²
4	100% of Construct West Gate Facility	400 ft ²
5	100% of Pave West Gate Facility Lanes/Parking Lots	390,000 ft ²
6	100% of Grade Area for West Gate Facility	395,480 ft ²
7	100% of Pave Additional Lanes at Mississippi Gate	100,000 ft ²

Assumptions:

All land disturbance/grading area includes building construction, utility installation, landscaping, and paving operations.

Total Building Construction Area:	9,775 ft ²	(1 and 4)
Total Demolished Area:	0 ft ²	(None)
Total Paved Area:	511,000 ft ²	(3, 5, and 7)
Total Disturbed Area:	550,343 ft ²	(2, 6, and 7)
Construction Duration:	1.0 year(s)	
Annual Construction Activity:	230 days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment ^d	No. Req ^d . ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

- 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.
- c) The SMAQMD 2004 reference does not provide SO₂ emission factors. For this worksheet, SO₂ emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO₂ factor was found to be approximately 0.04 times the NO_x emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO_x emission factor for all other equipment (based on AP-42, Table 3.4-1)
- 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*	SMAQMD Emission Factors (lb/day)				
		NO _x	VOC	CO	SO ₂ **	PM ₁₀
Grading Equipment	2	152.898	22.792	178.621	3.058	5.129
Paving Equipment	2	30.360	5.232	44.484	0.607	0.845
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	1.507	0.224	1.751	0.045	0.051
Air Compressor for Architectural Coating	1	0.153	0.019	0.131	0.003	0.006
Architectural Coating**			8.058			

*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 NO_x = (Total Grading NO_x per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days
Grading:	550,343	12.63	12
Paving:	511,000	11.73	28
Demolition:	0	0.00	60
Building Construction:	9,775	0.22	230
Architectural Coating	9,775	0.22	20

(from "CY2009 Grading" worksheet)

(per the 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 CY 2008 Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀
Grading Equipment	1,834.78	273.50	2,143.46	36.70	61.55
Paving	850.07	146.50	1,245.54	17.00	23.65
Demolition	-	-	-	-	-
Building Construction	346.63	51.51	402.73	10.42	11.72
Architectural Coatings	3.07	161.54	2.61	0.06	0.12
Total Emissions (lbs):	3,034.55	633.05	3,794.35	64.18	97.04

Results: Total CY 2008 Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀
Total Project Emissions (lbs)	3,034.55	633.05	3,794.35	64.18	97.04
Total Project Emissions (tons)	1.52	0.32	1.90	0.03	0.05

Construction Fugitive Dust Emissions for CY 2008

Calculation of PM₁₀ Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	12.63 acres/yr	(From "CY2008 Combustion" worksheet)
Grading days/yr:	7.06 days/yr	(From "CY2008 Grading worksheet)
Exposed days/yr:	90 assumed days/yr	graded area is exposed
Grading Hours/day:	8 hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)
Soil percent silt, s:	8.5 %	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	25 %	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	90 days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, i:	16 %	Ave. of wind speed at Boulder, CO (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/colorado/boulder)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99
Mean vehicle speed, S:	5 mi/hr	(On-site)
Dozer path width:	8 ft	
Qty construction vehicles:	3.00 vehicles	(From "CY2008 Grading worksheet)
On-site VMT/vehicle/day:	5 mi/veh/day	(Excluding bulldozer VMT during grading)
PM ₁₀ Adjustment Factor k	1.5 lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor a	0.9 (dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor b	0.45 (dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
Mean Vehicle Weight W	40 tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	4.5 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	15 VMT/day	
Construction VMT per acre	8.4 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k/s/12)^a (W/3)^b] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM₁₀ Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.21 lbs/hr	4.5 hr/acre	0.90 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.66 lbs/VMT	8.4 VMT/acre	22.30 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = $1.7(s/1.5)[(365 - p)/235][(1/15)(J) = (s)(365 - p)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 6 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
 Soil Piles EF = 0.6 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM₁₀ Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.90 lbs/acre	12.63	NA	11	0.006
Grading	0.80 lbs/acre	12.63	NA	10	0.005
Vehicle Traffic	22.30 lbs/acre	12.63	NA	282	0.141
Erosion of Soil Piles	0.60 lbs/acre/day	12.63	90	682	0.341
Erosion of Graded Surface	26.40 lbs/acre/day	12.63	90	30,019	15.009
TOTAL				31,004	15.50

Soil Disturbance EF: 24.00 lbs/acre
 Wind Erosion EF: 27 lbs/acre/day

Back calculate to get EF: 347.76 lbs/acre/grading day

Construction (Grading) Schedule for CY 2008

Estimate of time required to grade a specified area.

Input Parameters
 Construction area: 12.63 acres/yr (from "CY2008 Combustion" Worksheet)
 Qty Equipment: 3.00 (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	12.63	1.58
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	12.63	6.18
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	6.32	6.37
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	6.32	2.61
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	12.63	4.43
TOTAL								21.17

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 21.17
 Qty Equipment: 3.00
 Grading days/yr: 7.06

Construction Combustion Emissions for CY 2009

Combustion Emissions of VOC, NO_x, SO₂, CO and PM₁₀ Due to Construction

Includes:

1	100% of Construct ARPC Administrative Facility	133,534 ft ²
2	100% of Pave Parking Lot for ARPC Administrative Facility	67,500 ft ²
3	100% of Grade Area for ARPC Administrative Facility	499,155 ft ²
4	100% of Construct Consolidated Training and Storage Facility	15,887 ft ²
5	100% of Grade Area for Consolidated Training and Storage	67,400 ft ²
6	100% of Construct Medical Squadron Facility	10,882 ft ²
7	100% of Grade Area for Medical Squadron Facility	43,874 ft ²
8	100% of Construct Civil Engineering Squadron Facility	11,960 ft ²
9	100% of Grade Area for Civil Engineering Squadron Facility	45,476 ft ²
10	100% Construct Communications Squadron Training Building	3,434 ft ²
	100% of Grade Area for Communications Squadron Training	
11	Building	25,705 ft ²
12	100% of Construct AFRC Group Headquarters Facility	23,660 ft ²
	100% of Pave Roads/Parking Lots for AFRC Group Headquarters	
13	Facility	13,500 ft ²
14	100% of Grade Areas for AFRC Group Headquarters Facility	104,546 ft ²
15	100% of Pave Aspen Way Expansion	100,000 ft ²

Assumptions:

All land disturbance/grading area includes building construction, utility installation, landscaping, and paving operations.

Total Building Construction Area:	199,357 ft ²	(1, 4, 6, 8, and 12)
Total Demolished Area:	0 ft ²	(None)
Total Paved Area:	181,000 ft ²	(2, 13, and 15)
Total Disturbed Area:	886,156 ft ²	(3, 5, 7, 9, 11, 14, and 15)
Construction Duration:	1.0 year(s)	
Annual Construction Activity:	230 days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment ^d	No. Req'd. ^a per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Req ^a . per 10 acres	NO _x (lb/day)	VOC ^b (lb/day)	CO (lb/day)	SO ₂ ^c	PM ₁₀ (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

- 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.
- The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.
- The SMAQMD 2004 reference does not provide SO₂ emission factors. For this worksheet, SO₂ emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO₂ factor was found to be approximately 0.04 times the NO_x emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO_x emission factor for all other equipment (based on AP-42, Table 3.4-1)
- 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*	SMAQMD Emission Factors (lb/day)				
		NO _x	VOC	CO	SO ₂ **	PM ₁₀
Grading Equipment	3	369.293	55.049	431.421	7.386	12.389
Paving Equipment	1	5.377	0.927	7.878	0.108	0.150
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	30.736	4.567	35.711	0.924	1.039
Air Compressor for Architectural Coating	1	3.126	0.389	2.664	0.063	0.124
Architectural Coating**			36.389			

*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 NO_x = (Total Grading NO_x per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft ²)	Total Area (acres)	Total Days
Grading:	886,156	20.34	12
Paving:	181,000	4.16	20
Demolition:	0	0.00	60
Building Construction:	199,357	4.58	230
Architectural Coating	199,357	4.58	20

(from "CY2010 Grading" worksheet)

(per the 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 CY 2009 Project Emissions by Activity (lbs)

	NO _x	VOC	CO	SO ₂	PM ₁₀
Grading Equipment	4,431.51	660.59	5,177.06	88.63	148.67
Paving	107.54	18.53	157.56	2.15	2.99
Demolition	-	-	-	-	-
Building Construction	7,069.39	1,050.51	8,213.59	212.61	238.94
Architectural Coatings	62.52	735.57	53.27	1.25	2.47
Total Emissions (lbs):	11,670.96	2,465.20	13,601.48	304.64	393.08

Results: Total CY 2009 Project Annual Emission Rates

	NO _x	VOC	CO	SO ₂	PM ₁₀
Total Project Emissions (lbs)	11,670.96	2,465.20	13,601.48	304.64	393.08
Total Project Emissions (tons)	5.84	1.23	6.80	0.15	0.20

Construction Fugitive Dust Emissions for CY 2009

Calculation of PM₁₀ Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	20.34 acres/yr	(From "CY2009 Combustion" worksheet)
Grading days/yr:	11.36 days/yr	(From "CY2009 Grading worksheet)
Exposed days/yr:	90 assumed days/yr	graded area is exposed
Grading Hours/day:	8 hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)
Soil percent silt, s:	8.5 %	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	25 %	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	90 days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, i:	16 %	Ave. of wind speed at Boulder, CO (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/colorado/boulder)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99
Mean vehicle speed, S:	5 mi/hr	(On-site)
Dozer path width:	8 ft	
Qty construction vehicles:	3.00 vehicles	(From "CY2010 Grading worksheet)
On-site VMT/vehicle/day:	5 mi/veh/day	(Excluding bulldozer VMT during grading)
PM ₁₀ Adjustment Factor k	1.5 lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor a	0.9 (dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
PM ₁₀ Adjustment Factor b	0.45 (dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM ₁₀ for unpaved roads)
Mean Vehicle Weight W	40 tons	assumed for aggregate trucks

TSP - Total Suspended Particulate

VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	4.5 hr/acre	
Bulldozer mileage per acre	1 VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	15 VMT/day	
Construction VMT per acre	8.4 VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k/s/12)^a (W/3)^b] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM₁₀ Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.21 lbs/hr	4.5 hr/acre	0.90 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.66 lbs/VMT	8.4 VMT/acre	22.30 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = $1.7(s/1.5)[(365 - p)/235]^{(1/15)(J)} = (s)(365 - p)(I)(J)/(3110.2941)$, p. A9-99.

Soil Piles EF = 6 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
 Soil Piles EF = 0.6 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM₁₀ Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.90 lbs/acre	20.34	NA	18	0.009
Grading	0.80 lbs/acre	20.34	NA	16	0.008
Vehicle Traffic	22.30 lbs/acre	20.34	NA	454	0.227
Erosion of Soil Piles	0.60 lbs/acre/day	20.34	90	1,099	0.549
Erosion of Graded Surface	26.40 lbs/acre/day	20.34	90	48,336	24.168
TOTAL				49,923	24.96

Soil Disturbance EF: 24.00 lbs/acre
 Wind Erosion EF: 27 lbs/acre/day

Back calculate to get EF: 215.97 lbs/acre/grading day

Construction (Grading) Schedule for CY 2009

Estimate of time required to grade a specified area.

Input Parameters
 Construction area: 20.34 acres/yr (from "CY2009 Combustion" Worksheet)
 Qty Equipment: 3.00 (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	20.34	2.54
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	20.34	9.95
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	10.17	10.26
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	10.17	4.21
2315 310 5020	Compaction	Vibrating roller, 6" lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	20.34	7.13
TOTAL								34.09

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 34.09
 Qty Equipment: 3.00
 Grading days/yr: 11.36

Privately-Owned Vehicle Emissions 2009 and Beyond - Proposed Action

Programmed manpower authorizations to operate and maintain the three new F-16 aircraft would increase by 12 full-time civilian Air Reserve Technicians, 144 part-time traditional reservists, and approximately 800 full-time AFRC personnel. No change in part-time personnel will be required for the Proposed Action. The increase in personnel is needed to satisfy the anticipated mission growth.

This worksheet estimates the additional privately-owned vehicle commuting emissions expected to result from the Proposed Action.

In general, POV emissions tend to decline as the fleet is replaced with later-model vehicles that have been manufactured to lower emission standards. For this analysis, the impacts of POVs have been estimated for 2007, the earliest year when most of the additional Proposed Action new staff are expected to be on Base.

Step 1 Estimate the Vehicle Miles Traveled (VMT) by Vehicle Class

For this analysis, we have assumed that the commuter fleet corresponding to these additional employees will reflect the passenger vehicle fleet on the roads using a national average vehicle mix. The passenger care VMT data are estimates from the USEPA MOBILE6 and National Mobile Inventory Model (NMIM) modeling program (<http://www.epa.gov/otaq/nmim.htm>).

USEPA MOBILE6 National Average Vehicle Mix

VClassId	Vehicle Class	Mix
1	LDGV	46.44%
2	LDGT1	6.74%
3	LDGT2	22.42%
4	LDGT3	7.80%
24	MC	3.99%

Assumptions Used To Estimate Mileage

1.2	Riders per vehicle
40	Miles avg. commute round trip
50%	Vehicles do daytime errands/lunch
10	Miles avg. errand/lunch round trip
230	Working Days Per Year (full-time)
50	Working Days Per Year (part-time)
13126	Baseline Full-Time Personnel
0	Baseline Part-Time Personnel
13,938	Proposed Full-Time Personnel
144	Proposed Part-Time Personnel

POV Vehicle Miles Traveled Assumed for This Estimate

Description of Vehicle Class	Vehicle Class	POV VMT %	Baseline POV Annual Miles	Proposed POV Annual Miles
Light-duty gasoline vehicles (passenger cars)	LDGV	46.44%	52,570,216	55,947,687
Light-duty gasoline trucks (SUVs, pickups GVWR 0-6000 lbs, LVW 0-3750 lbs)	LDGT1	6.74%	7,624,925	8,114,802
Light-duty gasoline trucks (GVWR 0-6000 lbs, LVW 3751-5750 lbs)	LDGT2	22.42%	25,384,225	27,015,082
Light-duty gasoline trucks (GVWR 6001-8500 lbs, ALVW 0-5750 lbs)	LDGT3	7.80%	8,830,630	9,397,970
Motorcycles	MC	3.99%	4,519,753	4,810,133
			98,929,748	105,285,674

Example: Proposed POV Annual VMT for LDGV = [(LDGV VMT %) * (new full-time personnel/riders per vehicle) * (working days per year)] * (miles avg. commute round trip) + [(new full-time personnel/riders per vehicle) * (% vehicles doing daytime errands/lunch) * (working days per year) * (miles avg. errand/lunch round trip)] + [(LDGV VMT %) * (new part-time personnel/riders per vehicle) * (working days per year) * (miles avg. commute round trip)] + [(new part-time personnel/riders per vehicle) * (% vehicles doing daytime errands/lunch) * (working days per year) * (miles avg. errand/lunch round trip)]

Step 2 Select the Appropriate Air Pollutant Emission Factors (grams per mile) for the POV Fleet

Emission Factors

Emission factors are taken from the USEPA MOBILE5 emissions model, as compiled and published in "Air Emissions Inventory Guidance Document for Mobile Sources and Air Force Installations" Air Force Institute for Environmental Safety and Occupational Health Risk Analysis (AFIERA), July 2001.

All vehicle emissions are calculated assuming that the average commute vehicle is five years old. That is calendar year 2009 emissions estimates assume that the average vehicle in each vehicle class is a 2004 model.

Note that PM₁₀ emission factors include both exhaust and "fugitive" emissions (paved road, brake & tire dust, etc.).

Emission Factors in g/mi from MOBILE5 Tables for 2004 Model Year Vehicles in CY2009.

	POV Low Altitude g/mi - 2009					
	NO _x	VOC	CO	SO ₂	PM ₁₀	
LDGV	1.0	1.0	14.6	0.072	0.71	
LDGT1	1.1	1.2	16.2	0.096	1.08	
LDGT2	1.2	1.2	16.9	0.098	2.58	
LDGT3	1.2	1.2	16.9	0.098	2.58	
MC	0.9	4.7	22.1	0.032	0.08	

Reference: Tables 4-2 through 4-53, (AF IERA, July 2001)

Notes:

LDGT1 and LDGT2 emission factors shown above were taken from AF IERA LDGT1 (0-6000 lbs) emission factors

LDGT3 emission factors shown above were taken from AF IERA LDGT2 (6001-8500 lbs) emission factors

Step 3 Multiply the Emission Factors Times the Annual Vehicle Miles Traveled for Each Vehicle Class
(and convert from grams to tons)

Baseline Commuter Emissions

POV Emissions by Vehicle Class- 2009						
	NO _x	VOC	CO	SO ₂	PM ₁₀	
LDGV	57.95	846.04	4.17	4.17	41.14	
LDGT1	9.25	10.09	136.16	0.81	9.08	
LDGT2	33.58	33.58	472.88	2.74	72.19	
LDGT3	11.68	11.68	164.50	0.95	25.11	
MC	4.48	23.42	110.10	0.16	0.40	
Total	116.93	136.71	1729.68	8.83	147.92	

Example: LDGV POV emissions for NO_x = (LDGV g/mi EF)*(LDGV POV Annual Miles)/(453 g/lb*2000 lb/ton)

Proposed Commuter Emissions

POV Emissions by Vehicle Class- 2011						
	NO _x	VOC	CO	SO ₂	PM ₁₀	
LDGV	61.67	61.67	900.39	4.44	43.79	
LDGT1	9.84	10.73	144.91	0.86	9.66	
LDGT2	35.73	35.73	503.26	2.92	76.83	
LDGT3	12.43	12.43	175.07	1.02	26.73	
MC	4.77	24.92	117.18	0.17	0.42	
Total	124.45	145.49	1840.81	9.40	157.43	

Delta Change in Commuter Emissions

	NO _x	VOC	CO	SO ₂	PM ₁₀	
Baseline	116.93	136.71	1729.68	8.83	147.92	
Proposed PT	0.63	0.74	9.35	0.05	0.80	
Proposed FT	124.15	145.49	1840.81	9.40	157.43	
Total Proposed	125.08	146.23	1850.16	9.45	158.23	
Increase Change	8.15	9.52	120.48	0.62	10.31	
Percent Change	6.97	6.97	6.97	7.02	6.97	

Note: Proposed PT = Part-time reservists working 50 days per year, 1 person per car, and driving 80 miles round trip

Privately-Owned Vehicle Emissions 2009 and Beyond - Proposed Action

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50%	Vehicles do daytime errands/lunch
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Step 2 Select the Appropriate Air Pollutant Emission Factors (grams per mile) for the POV Fleet

Emission Factors

Emission factors are taken from the USEPA MOBILE5 emissions model, as compiled and published in "Air Emissions Inventory Guidance Document for Mobile Sources and Air Force Installations" Air Force Institute for Environmental Safety and Occupational Health Risk Analysis (AFIERA), July 2001.

All vehicle emissions are calculated assuming that the average commute vehicle is five years old. That is calendar year 2009 emissions estimates assume that the average vehicle in each vehicle class is a 2004 model.

Note that PM₁₀ emission factors include both exhaust and "fugitive" emissions (paved road, brake & tire dust, etc.).

Emission Factors in g/mi from MOBILE5 Tables for 2004 Model Year Vehicles in CY2009.

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	NO _x	VOC	CO	SO ₂	PM ₁₀	
LDGV	1.0	1.0	14.6	0.072	0.71	
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LDGT2	1.2	1.2	16.9	0.098	2.58	
LDGT3	1.2	1.2	16.9	0.098	2.58	
MC	0.9	4.7	22.1	0.032	0.08	

Reference: Tables 4-2 through 4-53, (AF IERA, July 2001)

Notes:

LDGT1 and LDGT2 emission factors shown above were taken from AF IERA LDGT1 (0-6000 lbs) emission factors
 LDGT3 emission factors shown above were taken from AF IERA LDGT2 (6001-8500 lbs) emission factors

Step 3 Multiply the Emission Factors Times the Annual Vehicle Miles Traveled for Each Vehicle Class
(and convert from grams to tons)

Baseline Commuter Emissions

POV Emissions by Vehicle Class- 2009						
	NO _x	VOC	CO	SO ₂	PM ₁₀	
LDGV	57.95	846.04	4.17	4.17	41.14	
LDGT1	9.25	10.09	136.16	0.81	9.08	
LDGT2	33.58	33.58	472.88	2.74	72.19	
LDGT3	11.68	11.68	164.50	0.95	25.11	
MC	4.48	23.42	110.10	0.16	0.40	
Total	116.93	136.71	1729.68	8.83	147.92	

Example: LDGV POV emissions for NO_x = (LDGV g/mi EF)*(LDGV POV Annual Miles)/(453 g/lb*2000 lb/ton)

Proposed Commuter Emissions

POV Emissions by Vehicle Class- 2011						
	NO _x	VOC	CO	SO ₂	PM ₁₀	
LDGV	61.67	61.67	900.39	4.44	43.79	
LDGT1	9.84	10.73	144.91	0.86	9.66	
LDGT2	35.73	35.73	503.26	2.92	76.83	
LDGT3	12.43	12.43	175.07	1.02	26.73	
MC	4.77	24.92	117.18	0.17	0.42	
Total	124.45	145.49	1840.81	9.40	157.43	

Delta Change in Commuter Emissions

	NO _x	VOC	CO	SO ₂	PM ₁₀	
Baseline	116.93	136.71	1729.68	8.83	147.92	
Proposed PT	0.63	0.74	9.35	0.05	0.80	
Proposed FT	124.15	145.49	1840.81	9.40	157.43	
Total Proposed	125.08	146.23	1850.16	9.45	158.23	
Increase Change	8.15	9.52	120.48	0.62	10.31	
Percent Change	6.97	6.97	6.97	7.02	6.97	

Note: Proposed PT = Part-time reservists working 50 days per year, 1 person per car, and driving 80 miles round trip

Metropolitan Denver Intrastate Air Quality Control Region

Row # SORT	State	County	Area Source Emissions						Point Source Emissions					
			CO	NOx	PM10	PM2.5	SO2	OC	CO	NOx	PM10	PM2.5	SO2	OC
1	CO	Adams Co	102,726	12,331	11,107	2,656	792	11,707	2,355	13,552	2,890	2,224	21,172	4,969
2	CO	Arapahoe Co	174,656	16,873	13,437	3,291	1,073	17,414	597	733	549	281	69	2,331
3	CO	Boulder Co	80,483	8,480	10,239	2,611	571	10,032	550	4,371	1,143	608	5,235	2,045
4	CO	Clear Creek Co	12,930	1,470	1,915	419	62.6	995	78.6	56.8	79.1	53.5	4.9	40.3
5	CO	Denver Co	191,353	21,761	6,554	2,367	1,581	20,033	1,064	6,367	740	552	4,734	3,434
6	CO	Douglas Co	69,361	7,664	9,672	2,105	475	5,636	149	51.6	248	126	89	424
7	CO	Gilpin Co	2,082	442	828	196	34.1	336	0	0	0	0	0	0
8	CO	Jefferson Co	177,730	17,156	12,763	2,914	975	18,532	819	2,638	682	489	2,882	3,365
Grand Total			811,301	86,177	66,515	16,559	5,564	84,685	5,613	27,769	6,331	4,334	34,186	16,608

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 (2001)
Site visited on 22 March 2007.

Metropolitan Denver Intrastate AQCR : Adams Co, Arapahoe Co, Boulder Co, Clear Creek Co, Denver Co, Douglas Co, Gilpin Co, and Jefferson Co (40 CFR 81.16).

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APPENDIX E

SUMMARY TABLES FOR CUMULATIVE IMPACTS CALCULATIONS

Table E-1: Annual Breakdown of Construction and Demolition Activities 2002 to 2012+

Demolition Area (ft ²)	Construction Demolition Days of Ground Disturbance	Ground Disturbance				Total Acres/year	Construction and Demolition % of total
		Construction Acres/year	Construction % of total	Demolition Acres/year	Demolition % of total		
0	967	62.39	7.55%	1.38	7.36%	63.77	7.55%
12,000	2,384	83.69	10.13%	0.55	2.94%	84.24	9.97%
20,378	1,938	176.30	21.34%	0.94	5.00%	177.24	20.98%
51,539	2,446	80.70	9.77%	7.23	38.66%	87.93	10.41%
264	1,579	42.10	5.10%	0.01	0.07%	42.11	4.98%
9,697	2,925	74.03	8.96%	0.45	2.43%	74.48	8.82%
20,420	1,270	15.63	1.89%	0.94	5.01%	16.57	1.96%
14,059	3,872	51.05	6.18%	0.65	3.45%	51.69	6.12%
22,403	708	21.98	2.66%	3.51	18.77%	25.49	3.02%
15,541	2,970	71.21	8.62%	0.71	3.81%	71.93	8.51%
49,236	1,090	15.94	1.93%	2.26	12.09%	18.20	2.15%
1,660	4,455	131.23	15.88%	0.08	0.41%	131.30	15.54%
217,197	26,603	826	100.00%	18.71	100.00%	844.96	100.00%

Table 4.2 Construction and Demolition Project Emissions					
Year	Emissions Generated from Construction and Demolition Site Disturbance Activities (Tons/Year)				
	VOC	NOx	SO ₂	CO	PM ₁₀
2002	1	4	0	10	13
2003	5	26	3	73	40
2004	11	37	4	112	32
2005	20	57	6	156	139
2006	11	39	4	114	32
2007	6	31	3	82	43
2008	10	50	5	144	26
2009	6	30	3	82	60
2010	3	15	1	36	8
TBD*	1	9	0	13	26
Cumulative Totals	74	298	29	822	419

Table 4.3 Heating and Hot Water Unit Air Emissions										
Year	Emissions Generated from Operation of Heating, Hot Water and Air Conditioning Units (Tons/Year)									
	Hydrocarbons		NOx		SO ₂		CO		PM ₁₀	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2002	0.04	0.04	0.79	0.79	0.00	0.00	0.66	0.66	0.06	0.06
2003	0.06	0.10	1.06	1.85	0.01	0.01	0.89	1.56	0.08	0.14
2004	0.12	0.22	2.24	4.09	0.01	0.02	1.88	3.43	0.17	0.31
2005	0.06	0.28	1.02	5.11	0.01	0.03	0.86	4.29	0.08	0.39
2006	0.03	0.31	0.53	5.64	0.00	0.03	0.45	4.74	0.04	0.43
2007	0.05	0.36	0.94	6.58	0.01	0.04	0.79	5.53	0.07	0.50
2008	0.01	0.37	0.20	6.78	0.00	0.04	0.17	5.70	0.02	0.52
2009	0.04	0.41	0.65	7.43	0.00	0.04	0.54	6.24	0.05	0.56
2010	0.02	0.42	0.28	7.71	0.00	0.05	0.23	6.47	0.02	0.59
2011	0.05	0.47	0.90	8.61	0.01	0.05	0.76	7.23	0.07	0.65
2012	0.01	0.48	0.20	8.81	0.00	0.05	0.17	7.40	0.02	0.67
TBD ⁽³⁾	0.09	0.58	1.66	10.48	0.01	0.06	1.40	8.80	0.13	0.80
Cumulative Totals	0.58	0.58	10.48	10.48	0.06	0.06	8.80	8.80	0.80	0.80

Table 4.4 New Personal Vehicle Pollutant Emissions						
Year	Emissions Generated from New Personal Vehicles (Tons/Year)					
	Hydrocarbons		NOx		CO	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2002	1.48	1.48	1.48	1.48	30.99	30.99
2003	1.98	3.46	1.98	3.46	41.57	72.56
2004	4.17	7.63	4.17	7.63	87.57	160.14
2005	1.91	9.53	1.91	9.53	40.08	200.22
2006	1.00	10.53	1.00	10.53	20.91	221.13
2007	1.75	12.28	1.75	12.28	36.77	257.90
2008	0.37	12.65	0.37	12.65	7.76	265.67
2009	1.21	13.86	1.21	13.86	25.36	291.02
2010	0.52	14.38	0.52	14.38	10.92	301.94
2011	1.68	16.06	1.68	16.06	35.37	337.32
2012	0.38	16.44	0.38	16.44	7.92	345.23
TBD ⁽³⁾	3.10	19.54	3.10	19.54	65.18	410.42
Cumulative Totals	19.54	19.54	19.54	19.54	410.42	410.42

Table 4.5 Proposed Action Air Emission Totals										
Year	Emissions (Tons/Year)									
	Hydrocarbons		NOx		SO₂		CO		PM₁₀	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
2002	2.52	2.52	6.27	6.27	0.00	0.00	41.66	41.66	13.06	13.06
2003	7.04	9.56	29.04	35.31	3.01	3.01	115.46	157.12	40.08	53.14
2004	15.29	24.85	43.41	78.71	4.01	7.02	201.45	358.57	32.17	85.31
2005	21.97	46.82	59.93	138.64	6.01	13.03	196.94	555.51	139.08	224.39
2006	12.03	58.84	40.53	179.17	4.00	17.03	135.36	690.87	32.04	256.43
2007	7.80	66.64	33.69	212.86	3.01	20.04	119.56	810.43	43.07	299.50
2008	10.38	77.02	50.57	263.43	5.00	25.04	151.93	962.36	26.02	325.52
2009	7.24	84.27	31.85	295.29	3.00	28.04	107.90	1,070.26	60.05	385.56
2010	3.54	87.80	15.80	311.08	1.00	29.05	47.15	1,117.42	8.02	393.59
TBD	4.20	92.00	13.77	324.85	0.01	29.06	79.58	1,197.00	26.13	419.71
Cumulative Totals	92.00	550.32	324.85	1,845.62	29.06	171.33	1,197.00	6,961.20	419.71	2,456.21

Table 4.12 Construction and Demolition Water Suppression Consumption			
Year	Water Required for Construction Projects (Gallons)	Water Required for Demolition Projects (Gallons)	Total (Gallons)
2002	7,840,097	0	7,840,097
2003	451,931	6,612	458,543
2004	6,088,667	18,850,739	24,939,406
2005	8,992,914	859,354	9,852,268
2006	83,678	1,832,143	1,915,820
2007	3,071,003	4,211,654	7,282,658
2008	1,104,665	18,944	1,123,609
2009	7,292,201	25,335	7,317,537
2010	2,862,971	19,129	2,882,100
2011	10,788,291	439,574	11,227,864
2012	1,742,383	106,467	1,848,851
Beyond 2012	8,711,972	12,434,846	21,146,818
Totals	59,030,772	38,804,797	97,835,570

Table 4.13 Finished Building Operational Water Consumption		
Year	Water Required for Human Consumption (Million Gallons)	
	Annual	Cumulative
2002	1.713	1.713
2003	2.298	4.011
2004	4.841	8.852
2005	2.216	11.068
2006	1.156	12.224
2007	2.033	14.257
2008	0.429	14.686
2009	1.402	16.088
2010	0.604	16.691
2011	1.955	18.647
2012	0.438	19.085
Beyond 2012	3.603	22.688
Totals	22.688	22.688

Table 4.14 Irrigation Water Consumption			
Year	Area Requiring Irrigation	Annual Water Required for Irrigation (Million Gallons)	Cumulative Water Required for Irrigation (Million Gallons)
2002	0.924	0.990	0.990
2003	4.856	5.205	6.196
2004	1.727	1.851	8.047
2005	11.391	12.210	20.257
2006	5.289	5.669	25.926
2007	0.588	0.630	26.556
2008	2.170	2.325	28.881
2009	4.431	4.750	33.631
2010	7.530	8.071	41.701
2011	9.823	10.529	52.230
2012	0.251	0.269	52.500
Beyond 2012	2.651	2.841	55.341
Totals	51.631	55.341	55.341

Table 4.15 Construction and Demolition Waste Generation - Proposed Action		
Year	Construction and Demolition Solid Waste Generation (Tons)	Percent of Total Waste Received by Denver-Arapahoe Disposal Site Landfill
2002	8,469	0.37%
2003	20,284	0.89%
2004	509	0.02%
2005	50,030	2.19%
2006	648	0.03%
2007	16,341	0.72%
2008	899	0.04%
2009	118,730	5.21%
2010	50,298	2.21%
2011	26,022	1.14%
2012	71,653	3.14%
Beyond 2010	3,801	0.17%
Totals	367,685	16.13%

Table 4.16 Cumulative Water Consumption			
Year	Buckley AFB Cumulative Water Increase (Million Gallons)	City of Aurora Construction Water Increase (Million Gallons)	Total Cumulative Water Increase (Million Gallons)
2002	11	842	852
2003	18	1,743	1,761
2004	32	2,614	2,646
2005	24	3,486	3,510
2006	9	4,357	4,366
2007	6	5,229	5,235
2008	4	6,100	6,104
2009	14	6,972	6,985
2010	12	7,843	7,855
2011	24	8,714	8,738
2012	3	9,586	9,588
Beyond 2012	18	10,457	10,475
Totals	173	67,943	68,116

Table 4.17 Cumulative Solid Waste Generation			
Year	Buckley AFB Cumulative Solid Waste Generation Increase (Tons)	City of Aurora Construction Solid Waste Generation Increase (Tons)	Total Cumulative Solid Waste Generation Increase (Tons)
2002	10,088	110,632	120,720
2003	21,902	261,105	283,007
2004	2,128	391,657	393,785
2005	51,648	522,210	573,858
2006	2,266	652,762	655,029
2007	17,959	783,315	801,274
2008	2,518	913,867	916,385
2009	120,349	1,044,420	1,164,769
2010	51,916	1,174,972	1,226,889
2011	27,641	1,305,525	1,333,165
2012	73,272	1,436,077	1,509,349
Beyond 2012	5,419	1,566,630	1,572,049

Table 4.18 Cumulative Electrical Demand Increases			
Year	Buckley AFB Electrical Demand Increase (kWh)	City of Aurora Construction Electrical Demand Increase (kWh)	Total Cumulative Electrical Demand Increase (kWh)
2002	10,717,030	612,846,000	623,563,030
2003	14,374,589	1,471,284,000	1,485,658,589
2004	30,282,288	2,206,926,000	2,237,208,288
2005	13,860,576	2,942,568,000	2,956,428,576
2006	7,230,778	3,678,210,000	3,685,440,778
2007	12,715,599	4,413,852,000	4,426,567,599
2008	2,684,623	5,149,494,000	5,152,178,623
2009	8,768,280	5,885,136,000	5,893,904,280
2010	3,775,552	6,620,778,000	6,624,553,552
2011	12,231,990	7,356,420,000	7,368,651,990
2012	2,737,809	8,092,062,000	8,094,799,809
Beyond 2012	22,539,953	8,827,704,000	8,850,243,953
Totals	141,919,068	57,257,280,000	57,399,199,068

Table 4.19 Cumulative Natural Gas Demand Increases			
Year	Buckley AFB Natural Gas Demand Increase (cf)	City of Aurora Construction Natural Gas Demand Increase (cf)	Total Cumulative Natural Gas Demand Increase (cf)
2002	16	681	697
2003	21	1,635	1,656
2004	45	2,452	2,497
2005	20	3,270	3,290
2006	11	4,087	4,098
2007	19	4,904	4,923
2008	4	5,722	5,726
2009	13	6,539	6,552
2010	6	7,356	7,362
2011	18	8,174	8,192
2012	4	8,991	8,995
Beyond 2012	33	9,809	9,842
Totals	210	63,619	63,829

Table 4.23 Construction/Demolition Debris Handling Traffic - Proposed Action			
Year	Weight of Debris Generated (tons)	Volume of Debris Generated (yd3)	Number of Truck Trips Required
2002	8,469	3,826	174
2003	20,284	11,216	510
2004	509	278	13
2005	50,030	27,692	1,259
2006	648	360	16
2007	16,341	9,035	411
2008	899	499	23
2009	118,730	458	21
2010	50,298	26,286	1,195
2011	26,022	14,408	655
2012	71,653	40,156	1,825
Beyond 2012	3,801	2,109	96
Totals	367,685	136,324	6,197

Table 4.25 Construction and Demolition Vehicles Entering the South Gate - Proposed Action			
Year	Construction and Demolition Contractor Employee Traffic (Vehicles/Day)	Construction and Demolition Delivery Traffic (Vehicles/Day)	Total (Vehicles/Day)
2002	10	40	50
2003	28	112	140
2004	32	128	160
2005	32	128	160
2006	14	56	70
2007	32	128	160
2008	14	56	70
2009	42	168	210
2010	10	40	50
2011	26	104	130
2012	22	88	110
Beyond 2012	44	176	220
Totals	306	1,224	1,530

Table 4.27 Increased Impervious Surface Calculations			
Year	Increased Impervious Surfaces Due to Construction (Acres)	Decreased Impervious Surfaces Due to Demolition (Acres)	Net Increased Impervious Surfaces (Acres)
2002	28.77	0.00	28.77
2003	41.48	0.28	41.20
2004	74.99	0.47	74.52
2005	25.27	2.10	23.17
2006	3.37	0.01	3.37
2007	13.35	0.22	13.13
2008	3.62	0.47	3.15
2009	35.96	0.32	35.64
2010	2.34	2.41	(0.06)
2011	27.72	0.36	27.37
2012	3.06	1.13	1.93
Beyond 2012	69.00	0.04	68.96
Totals	328.95	7.80	321.15

Table 4.28 Cumulative Increased Impervious Surface Calculations			
Year	Buckley AFB Increased Impervious Surfaces (Acres)	City of Aurora Increased Impervious Surfaces (Acres)	Cumulative Increased Impervious Surfaces (Acres)
2002	29	452	481
2003	41	1,121	1,162
2004	75	1,681	1,756
2005	23	2,242	2,265
2006	3	2,802	2,805
2007	13	3,363	3,376
2008	3	3,923	3,926
2009	36	4,483	4,519
2010	0	5,044	5,044
2011	27	5,604	5,632
2012	2	6,165	6,167
Beyond 2012	69	6,725	6,794
Totals	321	43,605	43,926

Table 4.29 Cumulative Increased Stormwater Loading Calculations			
Year	Buckley AFB Increased Stormwater Loading (Million Gallons)	City of Aurora Increased Stormwater Loading (Million Gallons)	Cumulative Increase in Increased Stormwater Loading (Million Gallons)
2002	11.91	187	199
2003	17.05	464	481
2004	30.84	696	727
2005	9.59	928	937
2006	1.39	1,160	1,161
2007	5.43	1,391	1,397
2008	1.30	1,623	1,625
2009	14.75	1,855	1,870
2010	-0.03	2,087	2,087
2011	11.32	2,319	2,330
2012	0.80	2,551	2,552
Beyond 2012	28.54	2,783	2,811
Totals	133	18,044	18,177

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APPENDIX F

AIR FORCE FORM 813

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS		Report Control Symbol RCS: A 4029
INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).		
SECTION I - PROPONENT INFORMATION		
1. TO (Environmental Planning Function) 460 CES/CEV	2. FROM (Proponent organization and functional address symbol) 140 CES	2a. TELEPHONE NO. 720-847-9903
3. TITLE OF PROPOSED ACTION ARPC Central Personnel Facility (NGB Portion)		
4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) To determine need for an EA / EIS or CATEX on Project CRWU 06-9198		
5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.) Construct Co-located facility for \$7 Mil in FY09, This is a conjunctively funded project to be added to the active duty ARPC BRAC facility. This will bring 137 full time guard positions to Buckley. There are no other options.		
6. PROPONENT APPROVAL (Name and Grade) <i>Mag William Smith</i>	6a. SIGNATURE <i>Will Smith</i>	6b. DATE <i>20 Sep 07</i>
SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)		
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)		X
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)		X
9. WATER RESOURCES (Quality, quantity, source, etc.)		X
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)	X	
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)		
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, threatened or endangered species, etc.)		X
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)	X	
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)	X	
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)	X	
16. OTHER (Potential impacts not addressed above.) <i>Traffic from new positions when combined with other new BRAC and tenant commands</i>		X
SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION		
17. <input type="checkbox"/> PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____; OR <input checked="" type="checkbox"/> PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.		
18. REMARKS <i>Requires an EA</i>		
19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade) <i>Elizabeth Meyer, VO-2</i>	19a. SIGNATURE <i>Elizabeth Meyer</i>	19b. DATE <i>3 Oct 07</i>

AF FORM 813, 19990901 (EF-V1)

THIS FORM CONSOLIDATES AF FORMS 813 AND 814. PREVIOUS EDITIONS OF BOTH FORMS ARE OBSOLETE.

PAGE 1 OF

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