



FINAL



**ENVIRONMENTAL ASSESSMENT FOR ROUTINE
BASEWIDE MILITARY-SPONSORED TRAINING EXERCISES,
EDWARDS AIR FORCE BASE, CALIFORNIA**

February 2007

**95th Air Base Wing
Civil Engineer and Transportation Directorate
Environmental Management Division
Edwards Air Force Base, California**

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14. ABSTRACT This report presents the results of the Environmental Assessment (EA) that evaluates the potential environmental effects associated with conducting a variety of basewide operational readiness exercises (OREs) and training activities. This EA was requested by the 95th Air Base Wing, Civil Engineer and Transportation Directorate, Environmental Management Division at Edwards AFB, California, and was conducted by JT3/CH2M HILL, from September 2006 through February 2007. Pursuant to the National Environmental Policy Act of 1969 (NEPA), this EA has been prepared to analyze the potential environmental consequences of the proposed action. The proposed project would be an increase in basewide OREs to expand from the current quantity with a wider range of scenario simulations. This increase would enable base organizations to comply with training requirements, improve operational readiness, and better prepare for deployment.					
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JT3/CH2M HILL
FLIGHT TEST SUPPORT CENTER

The views, opinions, and findings contained in this report are those of the author(s) and should not be construed as an official Department of the Air Force, Air Force Materiel Command (AFMC), position, policy or decision, unless so designated by other documentation.

For:
95th Air Base Wing
Civil Engineer and Transportation Directorate
Environmental Management Division
Edwards Air Force Base, California

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR ROUTINE BASEWIDE MILITARY-SPONSORED TRAINING
EXERCISES, EDWARDS AIR FORCE BASE, CALIFORNIA

1.0 INTRODUCTION

The Air Force Flight Test Center Inspector General, in coordination with the 95th Air Base Wing Civil Engineering Readiness Plans and Programs offices, proposes to conduct a variety of basewide operational readiness exercises (OREs) and training activities. The number of basewide OREs is expected to expand from the current quantity with a wider range of scenario simulations. This increase would enable base organizations to comply with training requirements, improve operational readiness, and better prepare for deployment. This Environmental Assessment (EA) evaluates the effects of increased OREs and training activities.

Under Alternative A, Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises, the types of training or exercises include:

- a. Preparation for operational readiness inspections through OREs and testing personnel recall procedures.
- b. Simulation of personnel and cargo deployment through ground-vehicle or aircraft transportation to include helicopters, with some deployment exercises originating from off base;
- c. Requirement for convoys to come on base as part of training exercises. Convoys could include tactical vehicles such as tanks. Training and exercise activities may involve the use of tactical vehicles on off-road terrain. Activities could include field artillery training consisting of land navigation and small-unit maneuvering while on foot. Areas that may be utilized for this type of training could be the Precision Impact Range Area. Base drop zones could be utilized to drop pallets and equipment, conduct parachute training, and exercise jumps;
- d. Testing of base response to simulated natural disasters; major accident response exercises, such as aircraft crashes and ground vehicle accidents; terrorist attacks; and various emergency situations, such as: robberies, kidnappings, medical emergencies, fires, suspicious packages, hazardous waste or fuel spills, explosions and bomb threats, guardgate situations, shootouts, in-flight emergencies, and alarm-activation response;
- e. Rehearsal for space-shuttle, orbital reentry, and astronaut-recovery procedures;
- f. Simulation of real world area of response utilizing Camp Corum to allow personnel to simulate war situations and perform self-aid buddy care;
- g. Small arms weapon firing utilizing the Combat Arms Range; and
- h. Conducting fire department training operations, Explosive Ordnance Disposal, and security forces training operations.

Under Alternative B, the No Action Alternative, training and exercise levels would continue at the current levels of operation. The frequency, types, and levels of training would be less intense than under Alternative A.

The EA documents the analysis of the activities required for both Alternatives A and B and supports this finding.

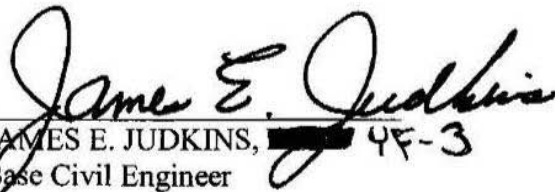
2.0 ENVIRONMENTAL EFFECTS

The proposed increased frequency of training and exercise activities at Edwards Air Force Base is not expected to significantly impact the environment. This EA has analyzed several components of the natural and manmade environment for potential impacts as a result of the proposed action. The potential impacts evaluated included: Land Use, Air Quality, Safety and Occupational Health, Hazardous Materials and Waste, Biological Resources, Cultural Resources, Geology and Soils, Socioeconomics, and Infrastructure. No potentially significant impacts were identified in any of these areas.

3.0 FINDINGS

A Finding of No Significant Impact for the Proposed Action has been determined based on the absence of significant adverse impacts to the environment. Background information that supports the research and development of this FONSI and the EA is on file at Edwards Air Force Base and can be obtained by contacting the following:

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Date 

COVER SHEET

ENVIRONMENTAL ASSESSMENT FOR BASEWIDE MILITARY SPONSORED TRAINING EXERCISES, EDWARDS AFB, CALIFORNIA

- a. Lead Agency: United States Air Force
- b. Cooperating Agency: None
- c. Proposed Action: Environmental Assessment for Routine Basewide Military Sponsored Training Exercises, Edwards Air Force Base, California
- d. Inquiries on this document should be directed to the 95th Air Base Wing, Civil Engineer and Transportation Directorate, Environmental Management Division, Attn: Gary Hatch, 5 East Popson Avenue, Building 2650A, Edwards Air Force Base, California 93524-8060, (661) 277-1454 or e-mail gary.hatch@edwards.af.mil.
- e. Designation: Draft Final Environmental Assessment (EA)
- f. Abstract: Pursuant to the *National Environmental Policy Act (NEPA) of 1969*, 42 United States Code 4321, this EA has been prepared to analyze the potential environmental consequences of the proposed action. The proposed project would conduct various basewide military-sponsored training and exercises at Edwards Air Force Base. The analysis in this EA illustrates that none of the environmental impacts from the proposed action would be significant if the required/recommended minimization measures are followed.

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
ACCS	accumulation site
ACM	asbestos-containing material
ADCA	<i>Animal Damage Control Act</i>
AF	Air Force
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFFTCI	Air Force Flight Test Center Instruction
AFI	Air Force Instruction
AFJMAN	Air Force Joint Manual
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AFRL	Air Force Research Laboratory
AHPA	<i>Archaeological and Historical Preservation Act</i>
AIRFA	<i>American Indian Religious Freedom Act</i>
AOC	area of concern
AOR	area of response
APCDs	Air Pollution Control Districts
AQMD	Air Quality Management Districts
ARAR	Applicable or Relevant and Appropriate Requirement
ARB	Air Resources Board
ARPA	<i>Archaeological Resources Protection Act of 1979</i>
ATC	air traffic control
AVAQMD	Antelope Valley Air Quality Management District
AQMD	Air Quality Management Districts
BACT	Best Available Control Technology
BLM	Bureau of Land Management
BMP	best management practice
BHPO	Base Historic Preservation Officer
bhp	brake horsepower
CAA	<i>Clean Air Act</i>
CAAA	<i>Clean Air Act Amendments</i>
CAAQS	California Ambient Air Quality Standards
Cal-EPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CAR	combat arms range
CARB	California Air Resources Board
CATEX	Categorical Exclusion
CCAA	<i>California Clean Air Act</i>
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDW	construction and demolition waste
CEQ	Council on Environmental Quality
CEQA	<i>California Environmental Quality Act</i>

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CESA	<i>California Endangered Species Act</i>
CFR	Code of Federal Regulations
CH&SC	California Health and Safety Code
CO	carbon monoxide
CNPS	California Native Plant Society
CUPA	Certified Unified Program Agency
CWRCB	California Water Resources Control Board
dB	decibel
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
DT&E	developmental test and evaluation
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIR	Economic Impact Region
EO	Executive Order
EOD	explosive ordnance disposal
EPCRA	<i>Emergency Planning and Community Right-to-Know Act</i>
ERP	Environmental Restoration Program
ESA	<i>Endangered Species Act of 1973</i>
FAA	Federal Aviation Administration
FFA	Federal Facility Agreement
FOD	foreign object damage
FONSI	Finding of No Significant Impact
FSTR	full spectrum threat response
HAP	hazardous air pollutants
HASP	Health and Safety Plan
HDDT	heavy duty diesel truck
HDGT	heavy duty gasoline truck
HQA	habitat quality analysis
HWMP	Hazardous Waste Management Plan
HWSF	Hazardous Waste Storage Facility
IAP	initial accumulation point
IAW	in accordance with
ICE	internal combustion engine
IMT	information management tool
INRMP	Integrated Natural Resources Management Plan
KCAPCD	Kern County Air Pollution Control District
LBP	lead based paint
LDDT	light duty diesel truck
LDGE	light duty gasoline engine

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

LDGT	light duty gasoline truck
LDGV	light duty gasoline vehicle
MARE	Major Accident Response Exercise
MBTA	<i>Migratory Bird Treaty Act of 1918</i>
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MSDS	Material Safety Data Sheet
mg/m ³	milligrams per cubic meter
mph	miles per hour
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NACA	National Advisory Committee for Aeronautics
NAGPRA	<i>Native American Graves Protection and Repatriation Act</i>
NASA	National Aeronautics and Space Administration
NBCC	nuclear, biological, chemical, and conventional
NEPA	<i>National Environmental Policy Act of 1969</i>
NFPA	National Fire Protection Association
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NPL	National Priorities List
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSR	new source review
O ₃	ozone
ORE	Operational Readiness Exercises
ORI	Operational Readiness Inspection
ORVA	off-road vehicle area
OSHA	Occupational Safety and Health Administration
Pb	lead
PIRA	Precision Impact Range Area
PL	Public Law
PM2.5	particulate matter less than or equal to 2.5 microns/respirable particulate matter
PM10	particulate matter less than or equal to 10 microns/fine particulate matter
PPA	<i>Pollution Prevention Act</i>
PPOA	Pollution Prevention Opportunity Assessment
PTE	potential to emit
PTO	permit to operate
ppm	parts per million
RCRA	<i>Resource Conservation and Recovery Act</i>
ROD	record of decision
RWQCB	Regional Water Quality Control Board
SABC	Self Aid Buddy Care
SCS	Soil Conservation Service
SEPRC	State Emergency Planning and Response Commission

LIST OF ABBREVIATIONS AND ACRONYMS (Concluded)

SIP	State Implementation Plan
SO ₂	sulfur dioxide
SO _x	sulfur oxides
SWPPP	Stormwater Pollution Prevention Plan
TPY	tons per year
TRI	toxic release inventory
TSE	Tactical Support Equipment
UBC	Uniform Building Code
UFC	Unified Facilities Criteria
UPC	Uniform Plumbing Code
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
UXO	unexploded ordnance
VOC	volatile organic compound
WMD	weapons of mass destruction
µg/m ³	1x10 ⁻⁶ grams per cubic meter

1.0 INTRODUCTION

1.1 Proposed Action (Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises)

The Air Force Flight Test Center (AFFTC) Inspector General, in coordination with the 95th Air Base Wing Civil Engineering Readiness Plans and Programs offices, proposes to conduct a variety of basewide operational readiness exercises (OREs) and training activities. The number of basewide OREs is expected to expand from the current quantity. Also expected, is a wider range of scenarios to be simulated. This Environmental Assessment (EA) evaluates the effects of increased OREs and training activities and would supplement activities already covered in the *Environmental Assessment for Bright Victory Edwards Air Force Base, California* (AFFTC 1998). This EA encompasses the expansion of the proposed action of that document.

1.2 Purpose and Need

The purpose of this EA is to assess possible environmental effects resulting from increased frequency and type of basewide exercise and training activities. The increases in training and exercises are necessary in order to assess and improve the operational readiness of the base and to prepare personnel to deploy. Military operations are practiced through simulated scenarios. There are established responsibilities, procedures, and standards for Air Force mitigation and emergency response to major accidents; natural disasters; terrorists use of weapons of mass destruction (WMD); and nuclear, biological, chemical, and conventional (NBCC) warfare (*Full Spectrum Threat Response (FSTR) Planning and Operations*, August 2005 [Air Force Instruction (AFI) 10-2501]). The responses to the scenarios indicate mission readiness and areas requiring improvement in readiness. Exercise activities help commanders achieve unity of effort, allocate and utilize resources effectively, and identify shortfalls in their response capabilities. Additional training activities occur when off-base organizations request the use of Edwards Air Force Base (AFB) to conduct training activities or missions. Often, Edwards AFB will meet specific requirements of off-base organizations to accomplish the goals of these missions through specifics, such as, the remoteness of the installation or the geographic terrain.

This EA only addresses training activities and operations. Any construction activities necessary to support these activities would need to be addressed separately.

1.3 Location and Scope of the Proposed Action

Edwards AFB is located in the Antelope Valley region of the western Mojave Desert in Southern California. It is about 60 miles northeast of Los Angeles, California. The base occupies an area of approximately 301,000 acres or 470 square miles. Portions of the base lie within Kern, Los Angeles, and San Bernardino counties (Figure 1).

Proposed project activities would be located throughout the base.

1.4 Issues and Concerns

The following sections discuss environmental factors that may be affected and may be of concern, due to the proposed action. The factors that are not affected as a result of the proposed action, are also presented.

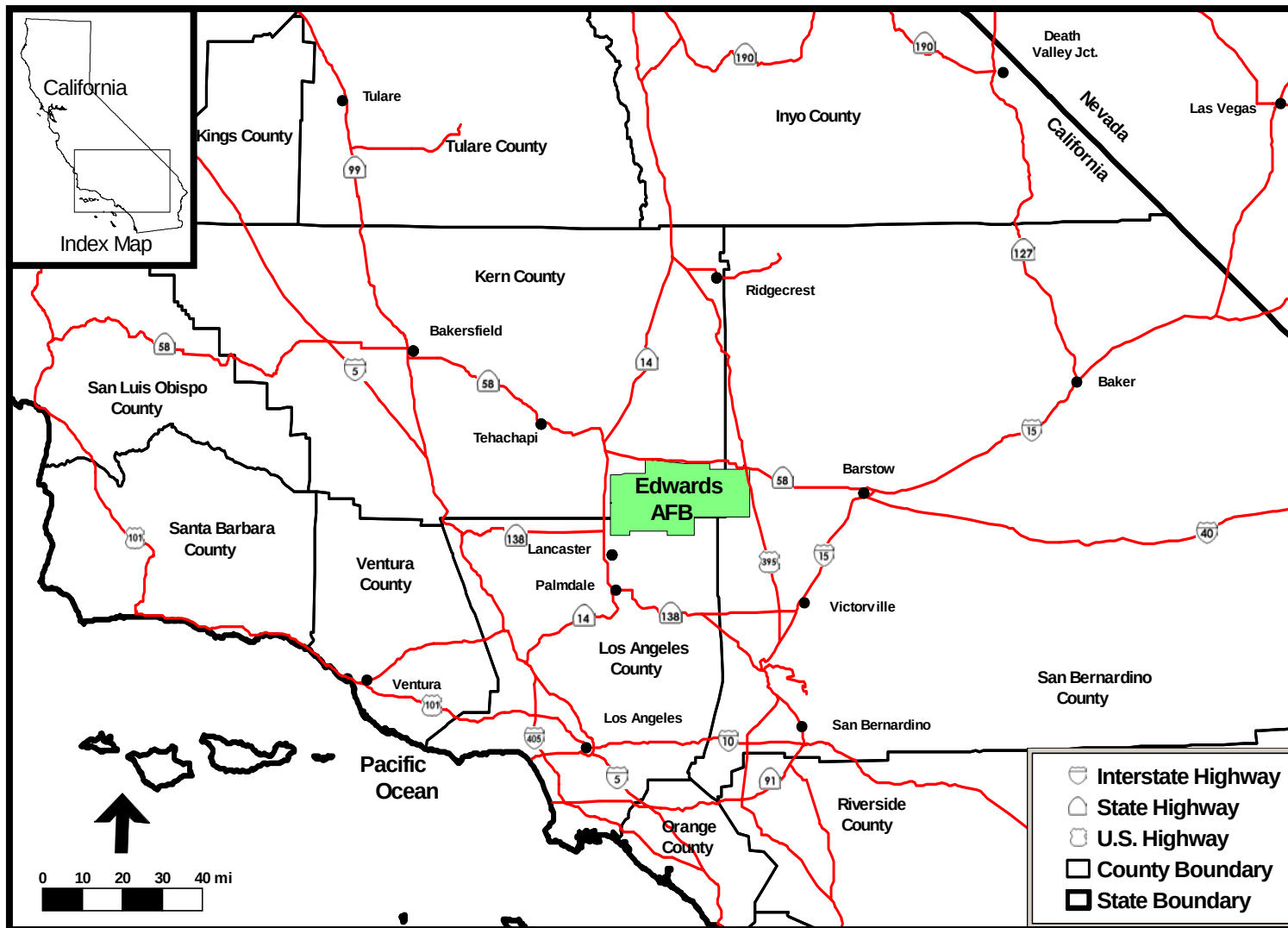


Figure 1. General Vicinity Map

1.4.1 Issues and Concerns Studied in Detail

During the scoping process, the following issues and concerns were identified as requiring assessment, when considering the potential environmental impacts of the alternatives.

a. Land Use: Proposed project activities would be located basewide, including the Main Base flightline area. Activities may create foreign object damage (FOD) material, which would be of concern to aircraft operations in the vicinity of the runway.

b. Air Quality: The proposed project would cause short-term degradation in air quality. Vehicles would generate criteria pollutants when transporting personnel to and from exercise areas. Exercise and training activities have the potential to generate fugitive dust.

c. Safety and Occupational Health: Due to the potential of some activities to occur on or near the flightline, noise levels generated by aircraft and helicopter operations may exceed the 65-decibel level. This may pose a risk to personnel in these areas. Project activities also have the potential to be located in Environmental Restoration Program (ERP) sites on the flightline, Precision Impact Range Area (PIRA), Combat Arms Range (CAR), or Air Force Research Laboratory (AFRL). An additional safety concern at Edwards AFB for any ground-disturbing activity is the presence of unexploded ordnance (UXO). Safety hazards associated with indoor and outdoor projects would include potential encounters with venomous snakes, and exposure to hanta virus and valley fever under certain environmental conditions.

d. Hazardous Materials and Waste: Proposed project activities may use hazardous materials and create hazardous waste. The proper use, handling, transportation, and storage of hazardous materials and hazardous waste to prevent human exposure and environmental contamination are required. These activities may generate solid wastes (including recyclable waste) that require disposal or recycling.

e. Biological Resources: Proposed project activities may impact wildlife and vegetation. The desert tortoise (*Gopherus agassizii*), listed as threatened under the federal *Endangered Species Act of 1973* (ESA), 16 United States Code (U.S.C.) 1531-1544, may be present in some areas during project activities. Exercise and training activities may also encounter nesting birds and roosting bats in structures.

f. Cultural Resources: Proposed project activities may impact cultural resource properties of prehistoric, historic, archaeological, architectural significance, or American Indian sites.

g. Geology and Soils: Project activities may damage ERP monitoring wells and underground lines. Ground-disturbing activities at or adjacent to ERP sites may disturb ongoing or future remediation activities.

h. Socioeconomic: The proposed activities would likely generate revenue into the local economy, resulting in a positive impact. Proposed project activities would not have a long-term impact on the base population, employment, housing, and/or schools.

i. Infrastructure: Under the proposed action traffic problems may be created by the nature of the exercise scenarios being enacted.

1.4.2 Issues and Concerns Eliminated from Detailed Study

The following issues and concerns were initially considered, but subsequently eliminated from further consideration in the EA.

a. Water Resources: Proposed project activities are not anticipated to affect groundwater quantity or quality. No water changes are anticipated to support exercise and training activities. There are no jurisdictional waters or “Waters of the United States” located within the project area. Therefore, there is no potential for adverse impact to the *Clean Water Act* (33 U.S.C. 1251 et seq.).

b. Environmental Justice: The Executive Orders (EOs) on Environmental Justice and the protection of children require federal agencies to identify and address disproportionately high adverse effects of its activities on minority, low-income populations, and/or children. This action has been reviewed in accordance with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and EO 13045, *Protection of Children from Environmental Health and Safety Risks*. Given that the training and exercise activities would occur entirely on base, the United States Air Force (USAF) has determined that this action has no substantial, disproportionate impact to minority, low-income populations, and/or children.

1.5 Regulatory Requirements, Permits, and Approvals

1.5.1 Regulatory Requirements

This EA has been prepared in order to comply with *National Environmental Policy Act* (NEPA) of 1969, and *Council on Environmental Quality* (CEQ) regulations implementing NEPA. This document is intended to fulfill the requirements for compliance with *National Environmental Policy Act of 1969* Title 40 Code of Federal Regulations (CFR) Parts 1500–1508 and AFI 32-7061, *The Environmental Impact Analysis Process*, the applicable AFI for implementing NEPA. *The Environmental Impact Analysis Process*, AFI 32-7061 completely adopts Title 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP).

1.5.2 Permits and Approvals

The contractor/proponent performing the work is responsible for obtaining the relevant permits and accomplishing any required notification. Environmental permitting requirements for all work on base are coordinated through Environmental Management Division. The following permits have been identified as potential requirements for the proposed activity; however, as permitting requirements change, others may also be required.

a. Air quality operational permits from the Kern County Air Pollution Control District (KCAPCD) may be required for stationary equipment (e.g., generators, air compressors, or welders) exceeding 50 brake horsepower (bhp) that remain on base for more than 45 days. Operational air permits are obtained prior to bringing equipment on base.

b. If nonpermitted stationary construction equipment (e.g., generators, air compressors, and welders) exceeding 50 bhp remain on base less than 45 days and emit less than 2 tons per year of any air contaminant, the equipment must have a written exemption from the Kern County Air Pollution Control Officer.

c. An AFFTC information management tool (IMT) 5926, *Edwards AFB Civil Engineering Work Clearance Request* (Digging Permit), is required for any trenching or digging operations that extend 12 or more inches below the ground surface.

d. Project activities will require an Air Force (AF) Form 813, *Request for Environmental Impact Analysis*.

e. An AF Form 592, *Welding, Cutting and Brazing Permit* (Hot Work Permit), is required for any project activities involving welding, torching, cutting, and brazing.

1.6 Related Planning Documents

A number of environmental documents have been prepared and approved that address activities related to project activities as discussed in this EA. These documents contain information used in the preparation of this EA. A listing of these documents is as follows:

a. *Edwards Air Force Base General Plan* (AFFTC 2001).

b. *Environmental Assessment for Bright Victory Edwards Air Force Base, California* (AFFTC 1998).

c. *Environmental Assessment for the Relocation of United States Marine Corps Helicopter Squadrons to Edwards Air Force Base, California* (AFFTC 1999c).

d. *Environmental Assessment for the Repair, Reconstruction, and/or Replacement of the Main Base Runway, Edwards Air Force Base, California* (AFFTC 2004a)

e. *Programmatic Environmental Assessment for Routine Flightline Activities, Edwards Air Force Base, California* (AFFTC 1997).

1.7 Future Use of this Document

Future proposed actions documented on an AF Form 813, would be reviewed and evaluated to determine if the future action falls within the scope of this EA. In the event that a future action is determined to fall within the scope of this EA, and no new environmental impacts would occur as a result of the future action, a categorical exclusion (CATEX) could be prepared upon submittal of the AF Form 813. A CATEX could also be prepared for future actions that would result in additional minor impacts not discussed in this EA, if impacts can be reduced to insignificant levels through minimization measures. In some cases, a supplement to this EA might be required. In that case, a new Finding of No Significant Impact (FONSI) would be required. Future actions that are found to result in significant impacts to the environment that cannot be minimized to a level of insignificance, would need to be addressed in an Environmental Impact Statement and a record of decision (ROD).

1.8 Organization of This Environmental Assessment

This EA consists of seven sections and one appendix which are summarized accordingly.

a. Section 1.0, Introduction: Describes the purpose and need for the proposed action, location of and scope of work, issues and concerns, regulatory requirements, and future use of this document.

- b. Section 2.0, Description of the Proposed Action and Alternatives: Describes and compares the alternatives and environmental consequences.
- c. Section 3.0, Affected Environment: Describes the existing environment at Edwards AFB and the surrounding area that may be affected.
- d. Section 4.0, Environmental Consequences: Discusses the environmental impact of the proposed action, including any adverse environmental effects that cannot be avoided; the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, including cumulative effects resulting from actions taken; and any irreversible or irretrievable commitment of resources that would be involved in the proposed action.
- e. Section 5.0, References: Provides the references cited throughout the document.
- f. Section 6.0, List of Preparers and Reviewers: Lists the persons who were primarily responsible for preparing and reviewing this EA.
- g. Section 7.0, List of Agencies and Organizations to Whom Copies of the Environmental Assessment Are Sent: lists the various agencies and organizations to whom copies of the EA are sent.
- h. Appendix A, Air Conformity Letter and Calculations: provides air emission calculations and the air conformity letter.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes the Proposed Action, Alternative A—Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises; and Alternative B—No Action Alternative. In addition, there is a brief description of other alternatives that were considered, but eliminated from further study, as well as a comparative analysis of the impacts of the alternatives.

2.1 Alternative A—Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises (Proposed Action)

Air Force Flight Test Center Inspector General, 95th Air Base Wing Civil Engineering Readiness, and Plans and Programs offices propose to increase the frequency and type of various required basewide military-sponsored training and exercises at Edwards AFB. This increase would enable base organizations to comply with training requirements, improve operational readiness, and better prepare for deployment. Training and exercise activities could occur anywhere on base; however, most would probably occur in the populated areas. Types of training or exercises include the following:

- a. Prepare for operational readiness inspections (ORI) through ORE;
- b. Test personnel recall procedures;
- c. Simulate personnel and cargo deployment; through ground-vehicle or aircraft transportation to include helicopters; some deployment exercises may originate from off-base;
- d. Other activities may involve convoys coming on base as part of training exercises. Convoys could include tactical vehicles such as tanks. Training and exercise activities may involve the use of tactical vehicles on off-road terrain. Activities could include field artillery training consisting of land navigation and small unit maneuvering while on foot. Areas that may be utilized for this type of training could be the PIRA;
- e. Utilize base drop zones in the form of dropping pallets and equipment for training and exercise purposes. Personnel may also participate in parachute training and exercise jumps on base drop zones;
- f. Bed-down activities of equipment and personnel may be required. This would be covered under the *Final Environmental Assessment for Bright Victory Edwards Air Force Base, California* (AFFTC 1998);
- g. Test base response to simulated natural disasters;
- h. Conduct Major Accident Response Exercises (MAREs), such as, aircraft or ground vehicle accidents;
- i. Test base response to simulated terrorist attacks;
- j. Test best response to various emergency situations, such as: robberies, kidnappings, medical emergencies, fires, suspicious packages, hazardous waste or fuel spills, explosions and bomb threats, guard-gate situations, shootouts, in-flight emergencies, and alarm-activation response;
- k. Rehearse space-shuttle, orbital reentry, and astronaut-recovery procedures. The readiness and efficiency of the AFFTC's support of the National Aeronautics and Space Administration (NASA) shuttle program is required to be maintained. This includes rescue, medical evaluation,

and transport of astronauts. Possible scenarios include: locating a shuttle mock-up on Rogers Dry Lakebed, on the main runway, other base location, or an off-base location and simulate emergency response. In some scenarios, helicopters would respond to the shuttle site to transport astronauts to the hospital;

l. Utilize Camp Corum to simulate a real world area of response (AOR) allowing personnel to simulate war situations. This would enable an assessment of the readiness of base personnel to perform duties while under chemical attack and perform Self Aid Buddy Care (SABC);

m. Utilize the Combat Arms Range for small arms weapon firing;

n. Conduct fire department training operations, to include live fire training in accordance with (IAW) the National Fire Protection Association (NFPA), 1403, *Standard on Live Fire Training Evolutions*, (2007). Live fire training is conducted on buildings to practice fire-fighting techniques;

o. Conduct Explosive Ordnance Disposal (EOD) training operations; and

p. Conduct security forces training operations.

2.2 Alternative B—No Action Alternative (Continuation of Activities)

The no action alternative is the continuation of current levels of training and exercise operations at Edwards AFB. These operations represent the baseline from which alternate actions are compared. Under this alternative, exercise and training activities would continue at the same frequency and type at Edwards AFB. Types of training and exercise activities would be the same as under Alternative A; however, the frequency and level of training and exercises would be less than under Alternative A. Exercise and training activities would be analyzed individually for environmental impacts through the NEPA process. Under this alternative, Edwards AFB would continue to comply with all applicable federal, state, local laws, and regulations.

2.3 Criteria for Selection of a Reasonable Range of Alternatives

The criteria identified in this section establishes a minimum set of requirements that must be met in order for an alternative to be considered viable. Those not meeting these minimum requirements have been eliminated from further discussion. The reasons for elimination are documented in Section 2.4. Alternatives meeting all selection criteria are retained and fully analyzed in Section 4.0, Environmental Consequences, of this EA. The criteria used to select the alternatives discussed in this document are:

a. Technical

- (1) Comply with AFI 10-2501, *Full Spectrum Threat Response (FSTR) Planning and Operations* (August 2005)
- (2) Comply with fire-training requirements under NFPA 1403
- (3) Available facility and transportation infrastructure to meet needs of users

b. Operational

- (1) Available communication infrastructure
- (2) Proximity to training facilities and ranges

- (3) Available munitions storage facilities
 - (4) Available hangar and administrative facilities
- c. Environmental
 - (1) Minimize impacts to environmental resources
 - (2) Remote location
 - (3) Geographic terrain
- d. Economic
 - (1) Beneficial impact to the base and local economy through purchase of goods and services

2.4 Alternatives Considered but Dismissed from Further Consideration

One other alternative to the proposed and no action alternatives was considered and dismissed. This alternative is to increase the frequency and type of training and exercise activities at an alternate location. This is not a viable alternative as it prevents the achievement of the technical, operational, environmental, and economic criteria. Edwards AFB personnel would need to be transported and housed at the alternate location. Exercise and training activities conducted at an alternate location would not be cost effective.

2.5 Comparison Summary of Alternatives

Table 1 presents a comparison summary of the project description and location for Alternative A, Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises, and Alternative B, No Action Alternative. Table 2 presents a comparison of the environmental impacts anticipated as a result of implementing these two alternatives.

Table 1. Comparison of Alternatives

	Alternative A Conduct Increased Frequency and Type of Basewide Military- Sponsored Training Exercises (Preferred Alternative)	Alternative B Maintain Current Exercises and Training Activities (No Action Alternative)
Project Description	Conduct increased frequency of basewide military-sponsored training exercises to prepare personnel for deployment to all areas of responsibility.	Maintain current exercise and training activities
Location	Basewide	Basewide
Description of Actions	Conduct increased frequency of various basewide military-sponsored training and exercises at Edwards AFB. Training and exercises are necessary in order to assess the operational readiness of the base and to prepare personnel to deploy. Military operations are practiced through simulated scenarios.	The current level of exercise and training activities would remain the same and would be conducted to meet specific mandates, as required.

Table 2. Summary of the Potential Environmental Impacts

Environmental Issue	Alternative A Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises (Proposed Action Alternative)	Alternative B Maintain Current Exercise and Training Activities No Action Alternative
Land Use		
Compatibility with the <i>Edwards Air Force Base General Plan</i> (Air Force Flight Test Center [AFFTC] 2001a)	Training and exercise activities would be compatible with the <i>Edwards Air Force Base General Plan</i> (AFFTC 2001) and all Air Force instructions and regulations. Sensitive resource areas would be avoided if possible. No significant adverse impacts are anticipated. <u>Minimizations:</u> Compliance with the <i>Edwards Air Force Base General Plan</i> (AFFTC 2001) and all Air Force instructions and regulations. Project activities may need approval by the Base Planning and Zoning Committee.	No change from existing conditions. <u>Minimizations:</u> Compliance with the <i>Edwards Air Force Base General Plan</i> (AFFTC 2001) and all Air Force instructions and regulations. Project activities may need approval by the Base Planning and Zoning Committee.
Foreign Object Damage (FOD) generation	The potential for FOD generation exists during training and exercise activities taking place on the flightline. No significant adverse impacts are anticipated. <u>Minimizations:</u> Project personnel shall use standard operating procedures for the prevention of FOD. Contact Airfield Management for FOD reduction guidelines.	No change from existing conditions. <u>Minimizations:</u> Project personnel shall use standard operating procedures for the prevention of FOD. Contact Airfield Management for FOD reduction guidelines.
Noise Exposure	Training and exercise activities on the flightline area may expose personnel to increased noise levels by aircraft and helicopter operations, engine testing, and the operation of powered technical support equipment. No significant adverse impacts are anticipated. <u>Minimizations:</u> All personnel present within hazardous noise areas as stated in Air Force Occupational Safety and Health (AFOSH) Standard 48-19, <i>Hazardous Noise Program</i> , shall follow the applicable hearing protection guidelines.	No change from existing conditions. <u>Minimizations:</u> All personnel present within hazardous noise areas as stated in AFOSH Standard 48-19, <i>Hazardous Noise Program</i> , shall follow the applicable hearing protection guidelines.
Air Quality		
Tons and types of pollutants generated	Increased air emissions would occur during training and exercise activities, specifically during helicopter operations. Total emissions during project activities of (to be calculated) oxides of nitrogen (NO _x) would be generated. No long-term significant adverse impacts are anticipated. <u>Minimizations:</u> Earthwork activities should be delayed during periods of high winds (in excess of 25 miles per hour). The exposed surfaces shall be sprayed with water to reduce dust. Comply with all applicable Kern County Air Pollution Control District (KCAPCD), Mojave Desert Air Quality Management District (MDAQMD), and Antelope Valley Air Quality Management District (AVAQMD) rules and regulations. In addition, all federal, state, and local rules and regulations must be complied with.	No change from existing conditions. <u>Minimizations:</u> Earthwork activities should be delayed during periods of high winds (in excess of 25 miles per hour). The exposed surfaces shall be sprayed with water to reduce dust. Comply with all applicable KCAPCD, MDAQMD, and AVAQMD rules and regulations. In addition all federal, state, and local rules and regulations must be complied with.

Table 2. Summary of the Potential Environmental Impacts (Continued)

Environmental Issue	Alternative A Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises (Proposed Action Alternative)	Alternative B Maintain Current Exercise and Training Activities No Action Alternative
Regionally significant	Not regionally significant	Not regionally significant.
Permits Required	Use of construction-related equipment with internal combustion engines (ICEs) over a 50-brake horsepower (bhp) rating (e.g., welders, generators, and compressors.) shall require a permit from the local air agency. If such equipment is to remain on base less than 45 calendar days, a written exemption must be obtained from the local air agency. <u>Minimizations:</u> Compliance with local air permit regulations required prior to the start of the project.	No change from existing conditions. <u>Minimizations:</u> Compliance with local air permit regulations required prior to the start of the project.
Safety And Occupational Health		
Potential exposure to hazardous noise levels	Training or exercise activities could expose personnel to hazardous noise levels, hazardous materials (including propellants and munitions), and hazardous environmental conditions. No significant adverse impacts are anticipated. <u>Minimizations:</u> Compliance with all applicable Occupational Safety and Health Association (OSHA), AFOSH, and California (Cal)-OSHA rules and regulations will minimize exposure hazards to personnel. Follow Health and Safety Plan (HASP) procedures for exposure conditions. Live ammunition used for training or exercises would be stored in accordance with Air Force Instruction (AFI) 91-201, <i>Explosives Safety Standards</i>.	No change from existing conditions. <u>Minimizations:</u> Compliance with all applicable OSHA, AFOSH, and Cal-OSHA rules and regulations will minimize exposure hazards to personnel. Follow HASP procedures for exposure conditions. Live ammunition used for training or exercises would be stored in accordance with AFI 91-201, <i>Explosives Safety Standards</i>.
Hazardous Materials And Waste		
Type and amount of hazardous material used	The amount and type of hazardous material used would be similar to those already used at Edwards AFB. No significant adverse impacts are anticipated. <u>Minimizations:</u> The contractor shall comply with all applicable federal, state, and local laws and regulations.	No change from existing conditions. <u>Minimizations:</u> The contractor shall comply with all applicable federal, state, and local laws and regulations.
Biological Resources		
Potential harm to desert tortoise and habitat	Training and exercise activities have the potential to impact the desert tortoise and their habitat. <u>Minimizations:</u> In addition to possible presurvey and education requirements, personnel shall adhere to the Terms and Conditions of the Biological Opinions listed in Section 3.6.2. The submittal of an Air Force (AF) Form 813, <i>Request for Environmental Impact Analysis</i>, may be required to properly analyze potential environmental impacts to biological resources.	No change from existing conditions. <u>Minimizations:</u> In addition to possible presurvey and education requirements, personnel shall adhere to the terms and conditions of the biological opinions listed in Section 3.6.2. The submittal of an AF Form 813, <i>Request for Environmental Impact Analysis</i>, may be required to properly analyze potential environmental impacts to biological resources.

Table 2. Summary of the Potential Environmental Impacts (Continued)

Environmental Issue	Alternative A Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises (Proposed Action Alternative)	Alternative B Maintain Current Exercise and Training Activities No Action Alternative
Cultural Resources		
Potential to impact archaeological and historic building sites	Training and exercise activities have the potential to impact archaeological and historic building sites during ground disturbing activities, demolition, or renovation of structures throughout the base.	No change from existing conditions.
	<u>Minimizations:</u> Coordinate with the Base Historic Preservation Office to determine if there are any potential cultural resource concerns. Comply with guidelines and directives. The submittal of an AF Form 813, <i>Request for Environmental Impact Analysis</i> , may be required to properly analyze potential environmental impacts to cultural resources.	<u>Minimizations:</u> Coordinate with the Base Historic Preservation Office to determine if there are any potential cultural resource concerns. Comply with guidelines and directives. The submittal of an AF Form 813, <i>Request for Environmental Impact Analysis</i> , may be required to properly analyze potential environmental impacts to cultural resources.
Geological and Soils		
Soil disturbance/erosion	Occasional site preparation, grading, and helicopter activities may disturb soil surfaces; and short-term erosion may occur when the soil becomes exposed to high winds, heavy rains, or during vehicular and equipment use. No significant adverse impacts are anticipated. <u>Minimizations:</u> Ground-disturbing activities should be delayed during high-wind conditions (in excess of 25 miles per hour). Vehicular traffic, grading, and digging should not be permitted during high-wind conditions. Exposed surfaces should be periodically sprayed with water.	No change from existing conditions. <u>Minimizations:</u> Ground-disturbing activities should be delayed during high-wind conditions (in excess of 25 miles per hour).
Environmental Restoration Program (ERP) Equipment Disturbance		
Potential to damage ERP monitoring wells and underground lines	Training and exercise activities have the potential to damage ERP monitoring wells and underground lines. No significant adverse impacts are anticipated.	No change from existing conditions.
	<u>Minimizations:</u> Prior to the onset of any training or exercise activities, proponent/contractor shall contact Environmental Management Restoration Branch to identify the location of ERP equipment. Damage to this equipment must be avoided.	<u>Minimizations:</u> Prior to the onset of any training or exercise activities, proponent/contractor shall contact Environmental Management Restoration Branch to identify the location of ERP equipment. Damage to this equipment must be avoided.

Table 2. Summary of the Potential Environmental Impacts (Concluded)

Environmental Issue	Alternative A Conduct Increased Frequency and Type of Basewide Military-Sponsored Training Exercises (Proposed Action Alternative)	Alternative B Maintain Current Exercise and Training Activities No Action Alternative
Socioeconomic		
Generation of revenue into the local economy	Training and exercise activities would have minimal positive impact to the local communities. <u>Minimizations:</u> None required.	No change from existing conditions. <u>Minimizations:</u> None required.
Infrastructure		
Training and exercise activities throughout the base have the potential to impact existing traffic patterns	Traffic delays are anticipated due to the nature of some exercise and training scenarios. No significant adverse impacts are anticipated. <u>Minimizations:</u> Traffic routes should be limited; however, some training and exercise activities may have an unavoidable impact to traffic. Submit traffic control plans with Security Police, Fire Protection Division, and Public Affairs Office.	No change from existing conditions. <u>Minimizations:</u> Traffic routes should be limited; however, some training and exercise activities may have an unavoidable impact to traffic. Submit traffic control plans with Security Police, Fire Protection Division, and Public Affairs Office.

3.0 AFFECTED ENVIRONMENT

This section describes the relevant resources at Edwards AFB that may be impacted by the action alternative if implemented. This section establishes the baseline against which the decision maker and the public can compare the effects of all action alternatives. The following environmental attributes comprise the existing environment: Land Use, Air Quality, Safety and Occupational Health, Hazardous Materials and Waste, Biological Resources, Cultural Resources, Geology and Soils, Socioeconomics, and Infrastructure.

3.1 Land Use

Land may be used for a variety of uses including residential, industrial, commercial, agricultural, recreational, and military. Specialized land uses may include administration buildings, housing, flight-training facilities, developmental test and evaluation (DT&E) facilities, aircraft hangars, runways and taxiways, radio transmission areas, bombing/missile, and explosive ordnance ranges, and munitions storage facilities. The *Edwards Air Force Base General Plan* (AFFTC 2001) lays out long-range development at Edwards AFB. The General Plan establishes the goals, policies, plans, and anticipated action regarding the physical, social, and economic environment.

3.1.1 Regulatory Requirements/Guidance

Air Force Instruction 13-213, *Airfield Management*, applies to all organizations that operate or administer functions and facilities for military Airfield Management.

Air Force Instruction 32-7062, *Air Force Comprehensive Planning*, contains the responsibilities and requirements for comprehensive planning and describes the procedures for developing, implementing, and maintaining the Comprehensive Plan within the installation.

Air Force Flight Test Center Instruction (AFFTCI) 10-2, *Control of Vehicles on the Airfield*, sets policies, procedures, and responsibilities for all agencies, including associates and contractors that operate or support vehicles on the Edwards AFB flightline.

Air Force Flight Test Center Instruction 11-2, *Ground Agency Operations*, applies to all ground agencies in support of aircraft operations at Edwards AFB. In addition, Air Force Joint Manual (AFJMAN) 24-306, *Manual for the Wheeled Vehicle Driver*; AFFTCI 10-2, *Control of Vehicles on the Airfield*; AFI 21-101, *Aerospace Equipment Maintenance Management*; and AFFTCI 11-15, *Scheduling Procedures for Aircraft and Air/Ground Support*, contain procedures, policies, and responsibilities for all aircraft operations at Edwards AFB.

3.1.2 On-Base Land Use

Edwards AFB consists of approximately 301,000 acres in Kern, Los Angeles, and San Bernardino Counties. The base contains largely undeveloped or semi-improved land that is used to support the flight testing of a wide variety of military, civilian, and experimental aircraft. The developed portion of the base includes approximately 6 percent of the total base area and is concentrated on the west side of Rogers Dry Lake. The developed areas include Main Base, South Base, North Base, and AFRL. The *Edwards Air Force Base General Plan* (AFFTC 2001) establishes land use designations for the base. These land use designations, total acreage, and associated percentage of the base area is presented in Table 3.

Table 3. Edwards Air Force Base Land Use Designations

Land Use Designation	Developed Area (Acres)
Airfield clearance and explosive clear zones	2,636
Airfield pavements	646
Lakebed painted runways	1,667
Lakebed nonmaintained landing site	13,582
Aircraft operations and maintenance	597
Engineering test	1,826
Aircraft test ranges	13,654
Industrial	3,418
Administrative	73
Community (commercial)	160
Community (service)	213
Medical	70
Housing (accompanied)	918
Housing (unaccompanied)	108
Outdoor Recreation	6,580
Buffer Zones	13,823
Water	0
Total	59,971

Source: *Edwards Air Force Base General Plan* (AFFTC 2001)

Within these various land use designations, specific areas have been set aside for particular purposes. These include, but are not limited to, areas such as the Off-Road Vehicle Areas (ORVA) 1 and 2, Combat Arms Range, hunting and fishing areas, PIRA, and AFRL (Figure 2).

3.1.2.1 Land Use Restrictions

Air Force land use policies and guidance are only applicable to lands under AF control. Policies established for airfields are similar to the criteria established by the Federal Aviation Administration (FAA) for development of surrounding civilian airports. Air Force Joint Manual 32-1013(I), *Airfield and Heliport Planning and Design Criteria*, sets the minimum requirements for airfield and applicable land uses for the areas surrounding the airfield. The Edwards AFB Planning and Zoning Committee grants final siting approval for all construction and activity related to projects as part of the review and approval process.

Edwards AFB has three runways that provide the principal landing surfaces for the base. These runways are divided into two different classes: Class A and Class B. The primary difference between Class A and Class B runways is determined by the type of aircraft using the runway. Class A runways are primarily used for small light aircraft, while Class B runways are primarily intended for high performance, large, and heavy aircraft. The Main Base runway is a Class B runway and the primary airstrip. The North and South Base runways are Class A runways.

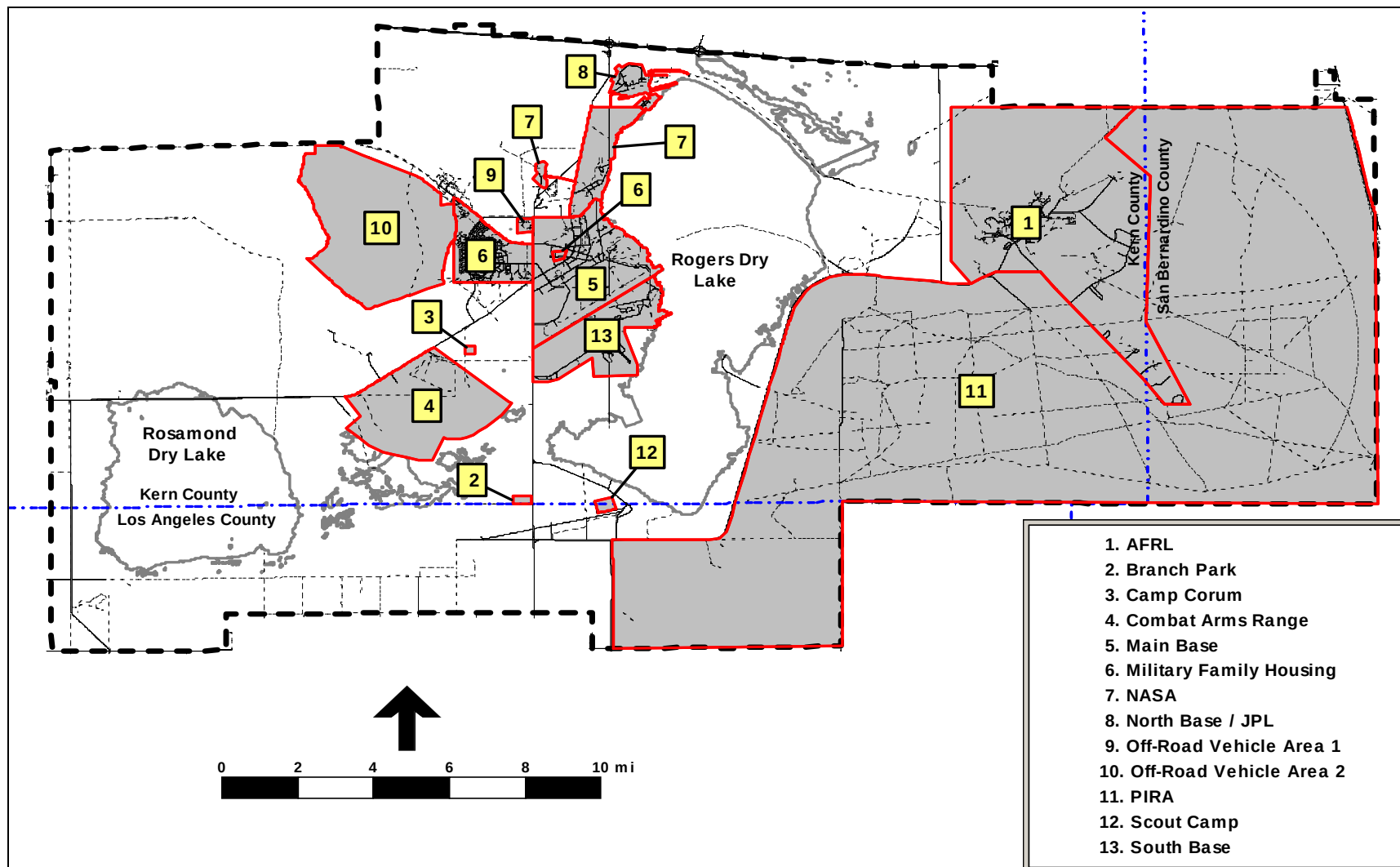


Figure 2. On-Base Land Use Areas

3.1.3 Airfield Operations

Flightline operations are carried out by the 412th Test Wing and the 95th Air Base Wing. The 412th Test Wing is the direct mission organization of the AFFTC and is responsible for DT&E of manned and unmanned aerospace vehicles, subsystems, and components. The 95th Air Base Wing is the support unit at Edwards AFB and is responsible for communications, civil engineering, environmental management, transportation (including loading and unloading or armament and supplies), fuel supply, security forces, and fire protection.

3.1.4 Foreign Object Damage Control

Foreign object damage refers to damage, particularly to aircraft, that occurs as a result of collision with, or ingestion of objects on or around runways, taxiways, and other areas of aircraft operations. The prevention of FOD is targeted specifically at flightline areas and implementation procedures are contained in the AFFTC Supplement 1 to AFI 21-101, *Aerospace Equipment Maintenance Management*. The Quality Assurance Inspection Branch manages the reduction and/or elimination of FOD.

3.2 Air Quality

Air quality in California is regulated by the United States Environmental Protection Agency, (U.S. EPA), California Air Resources Board (CARB), and locally by the Air Pollution Control Districts (APCDs) or Air Quality Management Districts (AQMD).

Stationary sources at Edwards AFB typically include fixed sources such as internal combustion engine (ICE) generators, external combustion boilers, and spray-paint booths. Mobile sources typically include motor vehicles, construction equipment, and aircraft.

3.2.1 Regulatory Requirements/Guidance

The 1970 *Clean Air Act* (CAA) and the 1990 *Clean Air Act Amendments* (CAAA) (Title 42 U.S.C. 7401–7671 and 42 U.S.C. 7661), respectively, are the body of federal laws that require the U.S. EPA and state to regulate air pollution emissions from stationary and mobile sources to protect public health and welfare. Air quality regulations were first promulgated with the *Clean Air Act* (CAA) and revised with the CAAA.

The federal CAA requires the U.S. EPA to establish and maintain National Ambient Air Quality Standards (NAAQS) that are used to manage air quality across the country. Under the *California Clean Air Act Amendments* (CCAA), California Health and Safety Code (CH&SC), Title 17, Division 26, Section 70200, the State of California has adopted ambient air quality standards, known as the California Ambient Air Quality Standards (CAAQS), which are published in the California Code of Regulations (CCR), Title 17, Section 70200, *Table of Standards*. Generally, CAAQS are more stringent than NAAQS. Pollutants for which standards have been established are termed “criteria” pollutants because the standards are based on criteria that show a relationship between pollutant concentrations and effects on health and welfare. From this relationship, the U.S. EPA and the state establish acceptable pollutant concentration levels to serve as ambient air quality standards.

Title 40 CFR, Part 61, *National Emission Standards for Hazardous Air Pollutants*, states that in addition to complying with the provisions of Part 61, the owner or operator of a stationary source subject to standards in this Part 61, may be required to obtain an operating permit issued to stationary sources by an authorized state air pollution control agency or by the administrator of the U.S. EPA pursuant to Title V of the CAA as amended 15 November 1990 (42 U.S.C. 7661).

Under the CAAA of 1990, Title V requires air agencies to establish federal operating permit programs and require major sources of air pollutant to obtain Title V operating permits. A Title V permit is an all-encompassing permit that includes all local air district permits and regulatory requirements and documents compliance with other CAA regulations.

Title I of the federal CAA (42 U.S.C. 7411.C.1) requires states with nonattainment areas to develop State Implementation Plans (SIPs) describing the measures the state will take to achieve attainment with NAAQS. The CH&SC identifies the State of California Air Resources Board (CARB) as the agency of air pollution control regarding all matters promulgated by federal law (CH&SC 39602). Local districts prepare SIP elements for the areas under their regulatory jurisdiction and submit these elements to the CARB for review and approval. The CARB then incorporates the individual air district elements into a statewide SIP. The SIP is then submitted to the U.S. EPA for approval and publication in the Federal Register. The local districts then enact rules and regulations to achieve their SIP requirements.

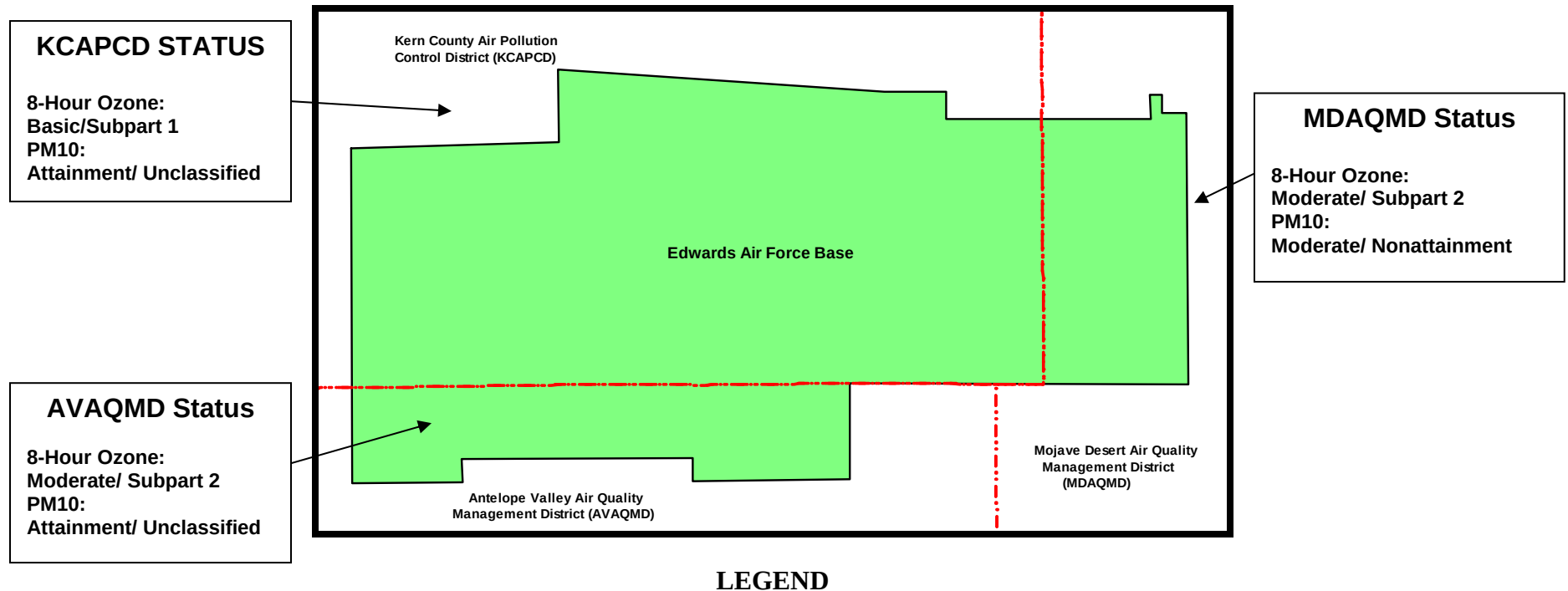
The NAAQS nonattainment status of the air districts with jurisdiction over Edwards AFB is presented in Figure 3. Kern County Air Pollution Control District (KCAPCD) is designated Basic/Subpart 1 nonattainment for the 8-hour ozone NAAQS, and in attainment or unclassified for particulate matter less than or equal to 10 micron/fine particulate matter (PM₁₀). Mojave Desert Air Quality Management District (MDAQMD) and Antelope Valley Air Quality Management District (AVAQMD) are both Moderate/Subpart 2 nonattainment for the 8-hour ozone NAAQS and moderate/nonattainment and attainment or unclassified for PM₁₀, respectively.

3.2.2 Environmental Setting

The AQMD and APCD boundaries are based on meteorological and geographic conditions and, where possible, jurisdictional boundaries such as county lines. Edwards AFB lies within the Mojave Desert Air Basin (MDAB). As shown in Figure 4, Edwards AFB is located within the jurisdiction of three local air districts: KCAPCD, MDAQMD, and AVAQMD. The MDAQMD has jurisdiction in San Bernardino County including the eastern portion of Edwards AFB, the AVAQMD has jurisdiction including the Los Angeles County portion of Edwards AFB, and the KCAPCD has jurisdiction including the Kern County portion of Edwards AFB.

Project activities could occur in any of the three local air districts. Most anticipated air emissions would be from mobile sources.

Edwards AFB Current NAAQS Attainment Status



SOURCE: California Air Resources Board website, 25 June 2006

Figure 3. National Ambient Air Quality Standards Attainment Status Map

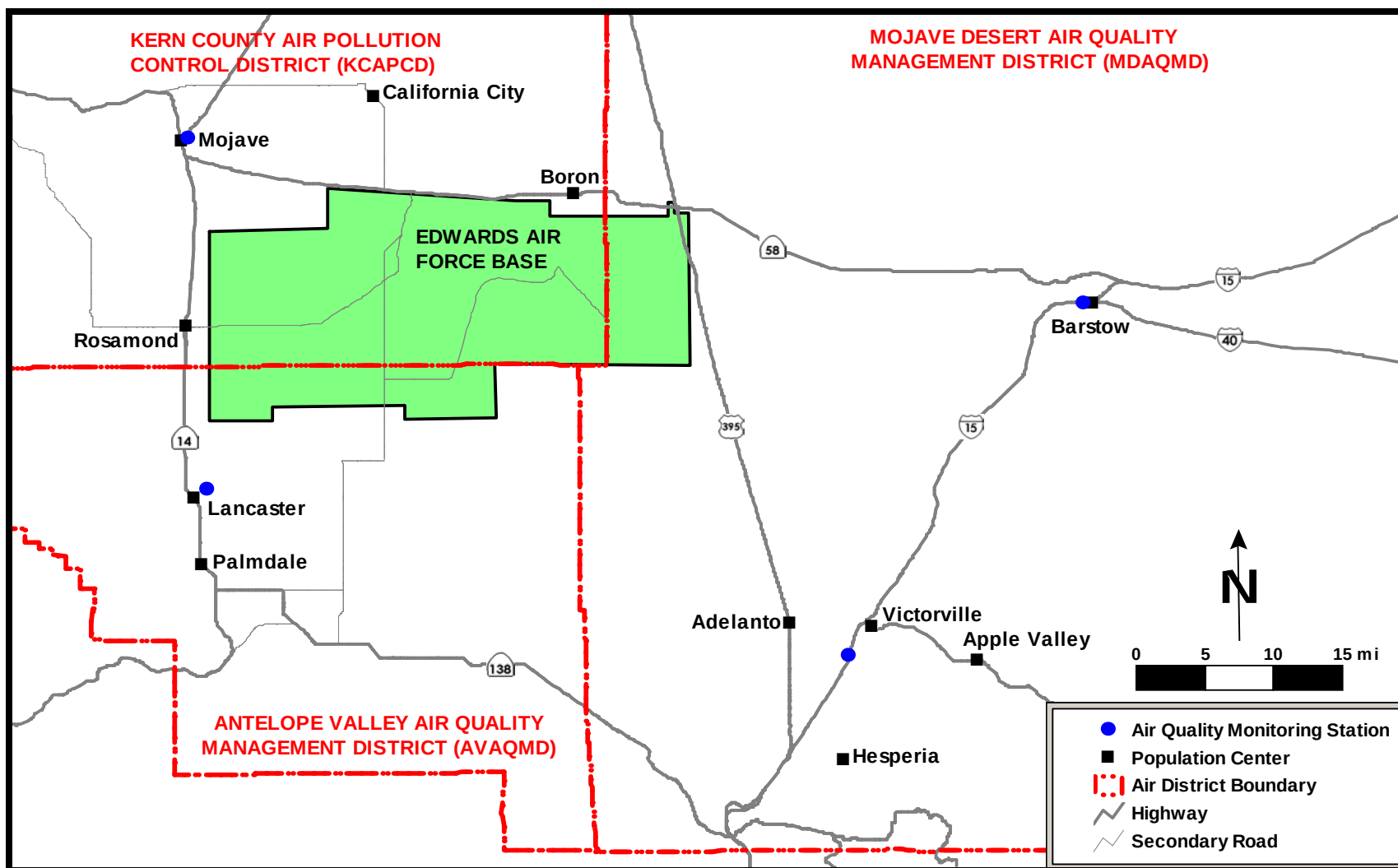


Figure 4. Air District Map

3.2.2.1 Climate

The Mojave Desert is sheltered from maritime weather influences of the Pacific Ocean by the Coastal range to the west and the San Gabriel Mountains to the south. The MDAB has an arid continental desert climate.

The climate of the Mojave Desert is governed by the strength and location of a semipermanent, subtropical, high-pressure cell over the Pacific Ocean. In general, hot summers, cold winters, infrequent rainfall, active air movement, and very low relative humidity characterize the climate of most of the region.

Thunderstorm activity in the region is rare. Relative humidity at the base is very low in the summer (30 to 50 percent in the early morning; 10 to 20 percent in the late afternoon). These conditions promote intensive heat during the day in the summer and marked cooling at night. The intense solar radiation in the summer is highly conducive to the formation of ozone and other photochemical oxidants in the atmosphere, but only when precursor chemicals are present.

3.2.2.2 Wind/Pollutant Dispersion

The prevailing wind direction is from the west-southwest (240 degrees) throughout the year, with an average windspeed of 8 miles per hour (mph). The highest average windspeeds occur during the spring and summer, with the lowest windspeeds occurring during the winter. Calm occurs about 19.3 percent of the time on an annual basis. Vertical dispersion of pollutants is described by the measure of atmospheric stability. Stable conditions indicate weak pollutant dispersion, which exist 57 percent of the time at Edwards AFB.

Area mountain and valley patterns cause a wide fluctuation in the levels of rainfall; and temperatures influence basin windflow that in turn affect dispersion along mountain ridges, vertical mixing, and photochemistry of pollutants.

The Tehachapi Pass in the Tehachapi Mountains and the pass through Saugus on Highway 14 serve as conduits allowing air movement from the San Joaquin Valley and the Los Angeles areas into the western portion of the MDAB. This air movement allows pollutant transport from the San Joaquin Valley and the Los Angeles basin to influence the air quality of the MDAB. Air pollution also enters the Antelope Valley from the San Bernardino area through the Cajon Pass (*Clean Air Act Conformity Analysis, Edwards AFB, California*) (AFFTC 1995a).

3.2.2.3 Baseline Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Air quality is determined by the type and amount of pollutants emitted into the atmosphere, size and topography of the air basin, and prevailing meteorological conditions. The significance of the pollutant concentration is determined by comparing it to the NAAQS and CAAQS. These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

The U.S. EPA has developed numerical concentration-based NAAQS for seven criteria pollutants under the provisions of the CAA. The NAAQS have been established for ozone (O₃), PM₁₀, fine particulate matter equal to or less than 2.5 microns (PM_{2.5}), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb).

The CARB has developed numerical concentration-based CAAQS for the same seven criteria pollutants plus visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The criteria pollutants and state and federal standards are listed in Table 4.

The CARB and U.S. EPA track air quality on an ongoing basis and designate areas or basins as either attainment or nonattainment, on a pollutant-specific basis, in accordance with either CAAQS or NAAQS. As indicated previously, for some pollutants an area can be designated as a basic, moderate, serious, severe, or extreme nonattainment area depending upon the level of pollutant concentrations. Likewise, if standards for pollutants are met in a particular area, the area is designated at attainment. Where standards may not have been established, or monitoring data does not exist for certain criteria pollutants, these areas are considered unclassified. Unclassified areas are treated as attainment areas until proven otherwise.

Table 5 presents the attainment status of eastern Kern County for criteria pollutants.

3.2.2.4 California State Implementation Plan

The California O₃ SIP was approved by the U.S. EPA in September 1996 (*Approval and Promulgation of Implementation Plans – California*) and codified into law in 40 CFR 52, Subpart F.

On 15 April 2004, the U.S. EPA designated eastern Kern County as Basic/Subpart 1 nonattainment for the 8-hour ozone NAAQS (40 CFR 81). The KCAPCD will be required to prepare a Basic/Subpart 1 attainment plan for EPA approval by June 2007. On 15 June 2005, the 1-hour ozone NAAQS was revoked by the EPA.

Other criteria pollutants not subject to SIP requirements implemented to achieve NAAQS include CO, NO₂, SO₂ and Pb because all are either in attainment or unclassified.

3.2.2.5 Ozone

Ozone is what is referred to as a secondary pollutant, a pollutant formed in the atmosphere by photochemical reactions involving previously emitted pollutants or precursors. Ozone precursors are mainly two types, volatile organic compound (VOCs) and nitrogen oxides (NO_x). Volatile organic compounds are organic compounds that contain carbon and hydrogen. The U.S. EPA defines a VOC as any organic compound that participates in atmospheric photochemical reactions. Nitrogen oxide is the designation given to the group of all oxygenated nitrogen species, including nitric oxide, nitrogen dioxide, nitric anhydride, and nitrous anhydride. Since VOCs and NO_x participate in atmospheric photochemical reactions that produce ozone, the attempt is made to control ozone through the control of VOCs and NO_x. Therefore, the pollutants of concern are VOCs and NO_x.

Table 4. Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		Federal Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	N/A	Same as Primary Standard	Ultraviolet Photometry
	8 Hours	0.07 ppm (137 µg/m ³)		0.08 ppm (157 µg/m ³) ⁸		
Respirable Particulate Matter (PM10)	24 Hours	50 µg/m ³	Gravimetric or Beta Attenuation	50 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m ³ *		150 µg/m ³		
Fine Particulate Matter (PM2.5)	24 Hours	No Separate State Standard		65 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m ³ *	Gravimetric or Beta Attenuation	15 µg/m ³		
Carbon Monoxide (CO)	8 Hours	9 ppm (10 mg/m ³)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)	None	NDIR
	1 Hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)		
	8 Hours (Lake Tahoe)	6 ppm (7 mg/m ³)		N/A		N/A
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	N/A	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m ³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m ³)		N/A		
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	N/A	Ultraviolet Fluorescence	0.03 ppm (80 µg/m ³)	N/A	Spectrophotometry (Pararosaniline Method)
	24 Hours	0.04 ppm (105 µg/m ³)		0.14 ppm (365 µg/m ³)	N/A	
	3 Hours	N/A		N/A	0.5 ppm (1300 µg/m ³)	
	1 Hour	0.25 ppm (655 µg/m ³)		N/A	N/A	N/A
Lead (Pb) ⁹	30-Day Average	1.5 µg/m ³	Atomic Absorption	N/A	N/A	N/A
	Calendar Quarter	N/A		1.5 µg/m ³	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hours	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more (0.07 per kilometer-visibility, 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 per percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No federal standards		
Sulfates	24 Hours	25 µg/m ³	Ion Chromatography			

Table 4 Federal and California Ambient Air Quality Standards (Concluded)

Pollutant	Averaging Time	California Standards ¹		Federal Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence	No federal standards		
Vinyl Chloride ⁹	24 Hours	0.01 ppm (26 µg/m ³)	Gas Chromatography			

Notes: 1. µg/m³–1 x 10⁻⁶ grams per cubic meter
2. N/A–not applicable
3. pm–parts per million
4. mg/m³–milligrams/per cubic meter

*On 20 June 2002, the Air Resources Board (ARB) approved staff’s recommendation to revise the PM10 annual average standard to 20 µg/m³ and to establish an annual average standard for PM2.5 of 12 µg/m³. These standards will take effect upon final approval by the Office of Administrative Law, which is expected in May 2003. Information regarding these revisions can be found at <http://www.arb.ca.gov/research/aaqs/std-rs/std-rs.htm>.

¹California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hours), nitrogen dioxide, suspended particulate matter – PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the *Table of Standards* in Section 70200 of Title 17 of the California Code of Regulations.

²National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current federal policies.

³Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celcius and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25 degrees Celcius and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

⁴Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

⁵National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

⁶National Secondary Standards: The levels of air quality necessary to protect the public welfare from any know or anticipated adverse effects of a pollutant.

⁷Reference method is as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA.

⁸New federal 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on 18 July 1997. Contact the U.S. EPA for further clarification and current federal policies.

⁹The ARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

¹⁰ Source: California Air Resources Board, web page 25 Jun 06

Table 5. Attainment Status of Eastern Kern County¹

Pollutant	Federal Status	State Status
Ozone (O ₃)–1-hour	Not Applicable (Standard revoked)	<i>Moderate</i> Nonattainment
Ozone (O ₃)–8-hour	<i>Basic/Subpart 1</i> Nonattainment	Not Applicable
Respirable Particulate Matter (PM ₁₀)	Unclassified	Nonattainment
Fine Particulate Matter (PM _{2.5})	Unclassified ²	Unclassified ²
Carbon Monoxide (CO)	Unclassified/Attainment	Unclassified
Nitrogen Dioxide (NO ₂)	Unclassified/Attainment ³	Attainment ³
Sulfur Dioxide (SO ₂)	Unclassified/Attainment ³	Unclassified ³
Lead	Attainment ³	Attainment ³

¹California Air Resources Board webpage, 26 June 2006

²PM_{2.5} attainment status is not currently classified.

³All areas in the state are either attainment or unclassified for nitrogen dioxide, sulfur dioxide, and lead.

Identifying the region of influence for air quality assessment requires knowledge of the pollutant types, source emission rates and release parameters, and local and regional meteorological conditions. For inert pollutants (all pollutants other than ozone, its precursors, and NO₂), the region of influence is generally limited to an area within a few miles downwind from the source. The region of influence for ozone may extend much farther downwind than that for other pollutants. In the presence of solar radiation, the maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted, and many miles from the source.

Ozone and its precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. Ozone concentrations are generally the highest during the summer months and coincide with periods of maximum solar radiation. The maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted, and many miles from the source. Maximum ozone concentrations tend to be regionally distributed because precursor emissions are homogeneously dispersed in the atmosphere (AFFTC 1995a). Ozone may pose a health threat to those who already suffer from respiratory diseases as well as healthy people.

On 15 April 2004, the U.S. EPA designated eastern Kern County as Basic/Subpart 1 nonattainment for the 8-hour ozone NAAQS. Under state regulations, the eastern Kern County area is designated *moderate* nonattainment for ozone. The area is attainment for PM₁₀ under federal regulations, but is nonattainment under state standards.

3.2.2.6 Particulate Matter

Particulate matter consists of very small liquid and solid particles in the air. Particulate matter less than 10 microns in diameter are referred to as PM₁₀. Particulate matter less than 2.5 microns in diameter are referred to as PM_{2.5} and are suspended in the air and called fine particles. These sources cause the formation of carbon (soot), organic carbon particles, trace metal compounds, and ammonium sulfate and nitrate particles. Sources of PM₁₀ include motor vehicles, wood-burning stoves and fireplaces, construction, landfills, agriculture, wildfires and bush/waste burning;

industrial sources, windblown dust from open lands, and paved and unpaved roads. Health effects may include increased respiratory disease, lung damage, and cancer.

The measurement of existing ambient criteria pollutant concentrations is accomplished using air quality monitoring stations. The closest CARB air quality monitoring station to Edwards AFB is located in Mojave, California. Table 6 shows the 2003 through 2005 data received at the monitoring station for criteria pollutants as they relate to NAAQS and CAAQS and the number of times the criteria pollutants measured at the Mojave Air Station equaled or exceeded the standards for a given year. For the purpose of this EA, the data provided is for information only. This data is only provided to illustrate the current ambient air quality in the Edwards AFB area.

3.2.3 Conformity Requirements

Under the conformity provisions of the CAAA, no federal agency can approve or undertake a federal action, or project, unless the project has been demonstrated to conform to the applicable SIP. These conformity provisions were put in place to ensure that federal agencies contribute to efforts to attain the NAAQS. The U.S. EPA has issued two conformity guidelines: transportation conformity rules that apply to transportation plans and projects and general conformity rules that apply to all other federal actions. A conformity determination¹ is only required for the alternative that is ultimately selected and approved. The general conformity determination is submitted in the form of a written finding, issued after a minimum 30-day public comment period on the draft determination.

Table 6. Number of Days Mojave Air Station Was Above the Hourly Standard for Criteria Pollutants

Criteria Pollutant	Days Equal to/or Exceeding Air Quality Standards	
	NAAQS	CAAQS
Ozone (O ₃)	27(2003)	31(2003)
	3 (2004)	8 (2004)
	9 (2005)	8 (2005)
	5(2006) ³	4(2006) ³
Respirable Particulate Matter (PM ₁₀)	0 (2003)	2 (2003)
	0 (2004)	0 (2004)
	0 (2005)	0 (2005)
Fine Particulate Matter (PM _{2.5})	0 (2003)	Not applicable
	0 (2004)	
	0 (2005)	
Nitrogen Dioxides	Not applicable	0 (2003)
		0 (2004)
		0 (2005)

Notes: 1. NAAQS–National Ambient Air Quality Standard
2. CAAQS–California Ambient Air Quality Standard

Source: California Air Resources Board, 15 May 03

Applicable only in areas designated as nonattainment or maintenance for NAAQS, the general conformity rule prohibits any federal action that does not conform to the applicable air quality attainment plan or SIP. General conformity applicability analysis required quantification of

¹ A conformity determination is a process that demonstrates how an action would conform to the applicable implementation plan. If the emissions cannot be reduced sufficiently, and if air dispersion modeling cannot demonstrate conformity, then either a plan for mitigating or a plan for offsetting the emissions would need to be pursued.

construction and operation emissions and comparison of these emission levels to baseline emission levels. If the difference in emissions exceeds the general conformity *de minimis* levels for the peak year or any milestone year for attainment of standards, additional general conformity determination is required.

A project is presumed to conform, if the emissions (ground vehicles, aircraft traffic, idling motor vehicles, and equipment) are less than the *de minimis* thresholds established by the conformity rule and they are not regionally significant (equal or less than 10 percent of the total emission inventory). Any emissions that exceed conformity thresholds, or are regionally significant, are required to demonstrate conformity with the SIP through minimization or other accepted practices.

In Kern County, Mojave Desert, and the Antelope Valley, the ozone precursor emissions, NO_x and VOC, are subject to general conformity requirements. In accordance with the air conformity requirements of 40 CFR 51.853/93.153(b)(1) the *de minimis* levels set for the O₃ attainment/maintenance areas is up to 100 tons per O₃ precursor pollutant (NO_x and VOC) per year, per federal action. The same *de minimis* level has been assumed for the basic nonattainment area.²

The 1994 California SIP includes KCAPCD, AVAQMD, MDAQMD data from the 1990 planning emission inventory. Table 7 presents the baseline inventory and 10 percent threshold values.

Table 7. 1990 Baseline and 10 Percent Threshold Values¹

District	1990 Baseline Values (tons/year)			10-Percent Threshold (tons/year)		
	NO _x	VOC	PM10	NO _x	VOC	PM10
KCAPCD	14,965	6,205	N/A	1,496.5	620.5	N/A
AVAQMD	10,220	12,775	N/A	1,022.0	1,277.5	N/A
MDAQMD	41,610	16,790	N/A	4,161	1,679	N/A

- Notes:
1. NO_x—oxides of nitrogen
 2. VOC—volatile organic compound
 3. PM10—particulate matter less than or equal to 10 microns
 4. KCAPCD—Kern County Air Pollution Control District
 5. N/A—Not Applicable
 6. AVAQMD—Antelope Valley Air Quality Management District
 7. MDAQMD—Mojave Desert Air Quality Management District

¹California Air Resources Board 1994, California SIP for O₃. Submitted to U.S. EPA on 15 November 1994. Accessed at <http://www.arb.ca.gov/planning/sip/94sip/94sip.htm> on 21 June 2004.

3.2.4 Local District Regulation

To ensure compliance with relevant federal and state air laws, each district enacts their own rules and regulations. Local air districts use stationary source New Source Review (NSR) permits,

² The U.S. EPA has not yet ruled on *de minimis* levels for basic nonattainment areas, but it can be assumed that the same levels would be allowed for basic nonattainment areas as are currently allowed for *moderate* nonattainment areas.

such as Air Traffic Control (ATCs) and permit to operate (PTOs) as means of implementing air quality rules and regulations. In addition, districts like the KCAPCD may develop guidelines for environmental review of proposed projects under the *California Environmental Quality Act* (CEQA, California Public Resources Code, Section 21000, et seq.).

For KCAPCD, NSR is implemented under KCAPCD Rule 210.1, *New and Modified Stationary Source Review (NSR)* and Rule 1303 in MDAQMD and AVAQMD 1994, *General Conformity Rule 1901*, 9 September. These rules and regulations provide for the preconstruction review of new and modified stationary sources of affected air pollutants to ensure emissions would not interfere with the attainment of ambient air quality standards; ensure appropriate new and modified sources of affected pollutants are constructed with the Best Available Control Technology (BACT); and provide for no net increase in emissions from new and modified stationary sources for all nonattainment pollutants and their precursors.

In order to enforce these rules, the air districts have established baseline emission levels for new or modified stationary sources of PM₁₀, sulfur oxides (SO_x), NO_x, and VOCs in nonattainment areas (Table 8). Projects that generate emissions in excess of these threshold levels would require offsets.

Table 8. New Source Review Threshold Emission Levels¹

Air District	New Source Review Threshold Emission Levels per Pollutant (tons/year)			
	PM ₁₀	SO _x	VOC	NO _x
KCAPCD	15	27	25	25
AVAQMD	15	25	25	25
MDAQMD	4	4	4	4

Notes: 1. PM₁₀—particulate matter less than or equal to 10 microns

2. SO_x—sulfur oxides

3. VOC—volatile organic compounds

4. NO_x—oxides of nitrogen

5. KCAPCD—Kern County Air Pollution Control District

6. AVAQMD—Antelope Valley Air Quality Management District

7. MDAQMD—Mojave Desert Air Quality Management District

¹ The KCAPCD Rules and Regulations 2004—<http://www.arb.ca.gov/DRDB/KER/CURHTML/R210-1.HTM>

3.3 Safety and Occupational Health

Safety and occupational health is defined as the protection of workers and the public from hazards. The total accident spectrum encompasses not only injury to personnel, but also damage or destruction of property or products. For worker safety, the boundary of the immediate work area defines the region of influence.

3.3.1 Regulatory Requirements/Guidance

The OSHA developed standards to promote a safe working environment. These standards establish general environmental controls, including personal protective equipment, wherever necessary because of hazards, processes, or the environment. Exposure limits for noise, ionizing and

nonionizing radiation, and toxic and hazardous substances have been established, as well as requirements for handling and storing compressed gases and flammable liquids. The OSHA Act also provides standards for emergency response to related hazardous chemicals and hazardous wastes.

Federal OSHA requirements and AFIs are the applicable regulatory requirements. California OSHA regulations do not apply to Edwards AFB Department of Defense (DOD) workers (e. g., military and civilian). Independent contractors are responsible for meeting Cal-OSHA requirements.

Statutory and regulatory requirements of the federal OSHA and the Air Force Occupational Safety and Health (AFOSH) Standards, which apply to the safety of workers at Edwards AFB, are enforced locally by Bioenvironmental Engineering, Ground Safety, and the base Fire Department. In addition, operational safety is supervised by various offices for specific activities.

The OSHA General Duty Clause, Section 5(a)1, states that employers will provide a workplace free of recognized hazards that cause or are likely to cause death or serious physical harm.

Title 29 CFR 1910.95, *Occupational Noise Exposure*, states that protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in this regulation.

3.3.2 Exposure Hazards

Hazardous noise exposure occurs when workers are present in areas where ambient noise levels exceed 85 decibel (dB). To prevent potentially harmful effects from exposure to hazardous noise to Air Force and civilian personnel, the USAF established a hazardous noise program under AFOSH Standard 48-19, *Hazardous Noise Program*. Under this program, Bioenvironmental Engineering is responsible for accomplishing hazardous noise surveillance to determine if military or DOD civilian personnel working in areas where hazardous noise exposure may occur require engineering and administrative controls, personal protection, or if potential hazardous noise areas require signage. Non-DOD civilian personnel working on the installation are exempt from AFOSH Standard 48-19, but must comply with applicable federal and state regulations.

Hazardous noise areas exist in the flightline area and the AFRL test-stand area. As such, workers are required to implement hearing protection measures. In addition, signs are posted to alert workers who are present in these hazardous noise areas.

For over 50 years, hazardous materials and wastes have been handled with varying levels of care and concern at Edwards AFB. Past hazardous materials/waste handling practices, considered standard for the industry and routinely used before the adoption of more stringent federal and state laws and regulations, often resulted in contamination of the environment. These practices have resulted in known and potential contamination at Edwards AFB, and can generally be classified into five categories according to *Edwards Air Force Base Hazardous Waste Management Plan* (HWMP) Number 32-7042, (AFFTC 1999a):

- a. Use of tanks, pipelines, and storage facilities that resulted in spills and leaks of fuels and hazardous spills;
- b. Use of cleaning agents (solvents, corrosives) and coating-related compounds (e.g., paints, thinners, strippers, and plating material);

- c. Use of sanitary landfills and hazardous waste disposal areas;
- d. Use of stormwater retention and evaporation ponds, and test stand catch basins for wastewater and surface runoff collections; and
- e. Use of fire training, where fuels and other flammable liquids were ignited for developing or practicing firefighting techniques.

At Edwards AFB, Environmental Management has been engaged in the ERP cleanup process since the 1980s. This program addresses the environmental contamination created by past practices, and includes identification, characterization, and remediation of site contamination, as necessary. Through the NEPA process, any ERP sites would be identified.

In September 1990, the base was placed on the U.S. EPA's National Priorities List (NPL). As a result, the Air Force signed a FFA that established a procedural framework to address the provisions of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), *Resource Conservation and Recovery Act of 1976* (RCRA), and various state programs. It also established the process for involving federal and state regulatory agencies and the public in the Edwards AFB remediation process (AFFTC 1999a).

Elements of the existing environment at Edwards AFB can present human health hazards. Specifically, personnel working outdoors may experience heat stress or hypothermia from exposure, be bitten by venomous snakes and spiders, contract hantavirus from exposure to rodents and/or their droppings, have limited exposure to pesticides and herbicides used for pest control, and contract valley fever from exposure to soils hosting coccidioidomycosis spores.

An additional safety concern at Edwards AFB for any ground-disturbing activity is the presence of UXO. Edwards AFB has a long history of use as a military installation and UXO items are occasionally found throughout the base, specifically the PIRA and the EOD areas. Due to the spent and unspent ordnance accumulated at targets on the PIRA and at the CAR, lead may be present in the soils around the targets.

3.4 Hazardous Materials and Waste

A hazardous material is any material whose physical, chemical, or biological characteristic, quantity, or concentration may cause or contribute to adverse effects in organisms or their offspring; pose a substantial present or future danger to the environment; or result in damage to or loss of equipment, property, or personnel.

Hazardous wastes are those substances that have been abandoned, recycled, or are inherently waste-like and (because of their quantity, concentration, or characteristics) have the potential to cause an increase in mortality or serious irreversible illness, or pose a substantial hazard to human health and/or the environment if improperly treated, stored, transported, and/or discarded.

For purposes of this analysis, hazardous material and hazardous waste are those substances that are regulated by CERCLA, 42 U.S.C. 9601, and RCRA (42 U.S.C. 6901–6991, respectively).

Solid waste refers to nonhazardous garbage, refuse, and any other discarded solid material resulting from residential, commercial, and industrial activities or operations. Solid waste can be classified as construction/demolition, nonhazardous recyclable, or nonhazardous nonrecyclable waste.

3.4.1 Regulatory Requirements/Guidance

The *Resource Conservation and Recover Act* (RCRA) is administered by the U.S. EPA. The RCRA regulates the handling, transport, storage, treatment, and disposal of solid and hazardous waste. It places responsibility for hazardous waste on the facilities generating the waste and requires them to meet various standards regarding personnel training, facility inspections, waste identification and analysis, emergency response planning, and recordkeeping.

The *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. The CERCLA authorizes short-term removal actions and long-term remedial response action. It establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites, provides for liability of persons responsible for release of hazardous waste at these sites, and establishes a trust fund to provide for cleanup when no responsible party can be identified.

Air Force Instruction 32-7042, *Solid and Hazardous Waste Compliance*, implements AFD 32-70, *Environmental Quality*. The Instruction identifies compliance requirements for all solid and hazardous waste, except radioactive waste.³ In the United States and its territories, this guidance is intended to be used with applicable federal, state, and local standards for solid and hazardous waste. Specifically, it contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in and disposal, as well as procedures for managing disposal contracts, inspections, permits, and recordkeeping.

Air Force Flight Test Center Instruction 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern the management of hazardous materials throughout the Air Force. The instruction applies to all Air Force personnel who procure, use, or dispose of hazardous materials.

Air Force Flight Test Center Instruction 32-19, *Hazardous Material Management Process*, ensures that AFFTC remains in compliance with all applicable federal, state, local, and Air Force regulations and laws regarding hazardous materials management. The instruction involves the use of information systems and positive control of hazardous material to minimize waste disposal. The hazardous material processes would be reviewed by the workplace supervisor, Environmental Management, Ground Safety, and Bioenvironmental Engineering to ensure the least occupationally and environmentally hazardous materials are used. All hazardous material transactions would occur using the current automated data system fielded for use at Edwards AFB.

The *Edwards Air Force Base Hazardous Waste Management Plan* (HWMP) Number 32-7042 (AFFTC 1999a) supports Air Force directives and is intended to ensure compliance with applicable federal, state, and local regulations. The objective of the HWMP is to provide sufficient

³ The applicable solid waste regulations are in Subtitle D of Title 40, CFR, Parts 240 to 243, 257, and 258; for hazardous waste, the applicable regulations are in Subtitle C, 40 CFR 260–272.

administrative direction and instructions for originators of RCRA and non-RCRA wastes to properly characterize, package, label, store, treat, handle, and transport hazardous waste at Edwards AFB. The goals are to ensure compliance with the applicable federal, state, and local hazardous waste regulations; simplify administrative procedures; and reduce pollution and environmental impacts through improved waste management practices.

The *Edwards Air Force Base Solid Waste Management Plan* (AFFTC 1999b) describes Environmental Management's functional management of municipal solid waste disposal and recycling at Edwards AFB. The purpose of the Management Plan is to comply with federal, state, and local regulations and Air Force policy and guidance on the management of nonhazardous municipal solid waste.

The federal *Emergency Planning and Community Right-to-Know Act* (EPCRA) of 1986 (42 U.S.C. 11001–11050) has specific reporting requirements that must be followed in the event of a release to the environment of hazardous or extremely hazardous substances, as designated under CERCLA. An inventory of hazardous substances released or used in excess of specified threshold quantities must be submitted annually to the responsible state agency (i.e., Certified Unified Program Agency [CUPA] and State Emergency Planning and Response Commission [SEPRC]). An inventory of accidental toxic releases in excess of specified threshold quantities must be reported directly to the California Environmental Protection Agency (Cal/EPA). Under EPCRA, specific storage requirements would also apply to handlers of hazardous materials.

The *Pollution Prevention Act* (PPA) of 1990 (42 U.S.C. 13101–13109) established a national policy for pollution prevention through source reduction and recycling. The PPA calls for the establishment of a nationwide source reduction program and a strategy for quantifying source reduction efforts. The Air Force has incorporated this national policy into operations and acquisition programs, as directed in AFI 32-7080, *Pollution Prevention Program*, which requires application of the following PPA-prioritized hierarchy of pollution prevention approaches:

- a. Prevent or reduce pollution at the source whenever feasible;
- b. Recycle pollution in an environmentally acceptable manner that cannot feasibly be prevented;
- c. Treat pollution that cannot feasibly be prevented or recycled; and
- d. Dispose of pollution into the environment only as a last resort.

3.4.2 Hazardous Materials

The types of hazardous materials most commonly used during construction projects include acids, corrosives, caustics, glycols, compressed gases, paints and paint thinners, solvents, sealants, adhesives, cements, caulking, fire retardant, and hot asphalt (140 degrees Fahrenheit or greater).

Prior to bringing any new hazardous material on base, contractors are required to provide a copy of the relevant material safety data sheet (MSDS) to Bioenvironmental Engineering, who maintain a master hazardous material inventory list for Edwards AFB with all listed MSDSs.⁴

⁴ Occupational Safety and Health Administration regulations (29 CFR 1910.1200) require MSDSs for all hazardous chemicals used on base. The MSDS identifies a chemical's identity, its physical and health hazard information, safe handling and use procedures (including exposure control measures), and product use warnings. Air Force Occupational Safety and Health Standard 48-21, *Air Force Hazard Communication Program*, reestablishes the minimum requirements for an effective hazard communication program for personnel who use or produce hazardous chemicals.

All organizations and contractors are required to maintain strict inventories of all hazardous materials. Furthermore, organizations are also required to reduce the quantity of hazardous materials used or replace them with nonhazardous material, if possible, as part of the Pollution Prevention Program. Guidelines used by Edwards AFB include AFI 32-7086, *Hazardous Materials Management*; AFI 32-7042, *Solid and Hazardous Waste Compliance*; and AFFTCI 23-1, *Hazardous Material Management Program*.

In response to AFI 32-7080, the AFFTC has prepared the *Edwards Air Force Base Pollution Prevention Plan* (AFFTC 1995b). This Plan contains eight program elements, six of which are required under AFI 32-7080. These elements include: ozone depleting substances, EPA-17 industrial toxic project chemicals, hazardous waste minimizations, municipal solid waste minimizations, affirmative procurements, energy conservation, VOC air emission reductions, and Toxic Release Inventory (TRI). Toxic Release Inventory is required under EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*, which requires federal agencies to comply with the amended PPA and the EPCRA.

The AFFTC uses Pollution Prevention Opportunity Assessments (PPOAs) in order to identify existing processes used, hazardous chemicals required for those processes, and recommended actions needed to eliminate and/or reduce pollution. The Pollution Prevention Plan (AFFTC 1995b) acknowledges Air Force requirements for the use of specific hazardous materials that would otherwise be targeted for reduction/elimination.

3.4.3 Hazardous Waste

The use of hazardous materials results in the generation of hazardous waste (e.g., paint waste, used oil, and contaminated rags) that requires proper handling and disposal. The U.S. EPA enforces RCRA, which provides guidelines for the generation, storage, transportation, and disposal of hazardous waste. The Cal/EPA enforces hazardous waste laws as stated in 22 CCR Chapters 10 through 20 and the California State Health and Safety Code (Section 25100), *Hazardous Waste Control*. Environmental Management administers all hazardous waste accumulation at Edwards AFB. Guidelines used by Edwards AFB include the HWMP (AFFTC 1999a), which was prepared in accordance with AFI 32-7042, *Solid and Hazardous Waste Compliance*. The HWMP establishes procedures to achieve compliance with Applicable or Relevant and Appropriate Requirements (ARARs) for hazardous waste management, except munitions, explosives, biohazards, and radioactive waste.⁵ The HWMP contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in and disposal, as well as procedures for inspections, permits, and recordkeeping.

The Hazardous Waste Support Facility (HWSF) at Edwards AFB is the final stage for on-base management of hazardous waste. The HWSF is managed by Environmental Management under a service contract and operates as a hazardous waste support facility in Building 4916. This facility is permitted to temporarily store (for up to 1 year) hazardous waste in accordance with 22 CCR 66270 under a Part B Permit. Wastes accumulated at initial accumulation points (IAPs) and accumulation sites (ACCSs) throughout the base, are transported to the HWSF prior to shipment off base for treatment, storage, or disposal. Federal standards require shipments of hazardous waste to be labeled,

⁵ The applicable hazardous waste regulations are in Subtitle C, 40 CFR 260–272.

marked, and placarded in accordance with United States Department of Transportation (DOT) Regulation 49 CFR, *Transportation*, Chapter I, Subchapters B and C.

The transportation of Environmental Management waste is governed by DOT regulations that specify procedures for transporting these materials on public highways, (49 CFR, 100–199; 40 CFR, 260–299; and 22, CCR, Division 4.5, Chapter 13). However, these state and federal DOT regulations do not apply to the transport of hazardous materials and/or hazardous wastes between points on base.

3.4.4 Solid Waste

Edwards AFB operates a nonhazardous (municipal solid waste) landfill within the Main Base area and has an established procedure for staging and processing inert debris and disposing of construction and demolition debris. Civil Engineering will specify the area where the inert debris should be stockpiled. If this location is not approved at the time of project activities, construction and demolition waste (CDW) disposal would then be required at an approved state-licensed landfill.

The base actively participates in a recycling program. A contractor operates the program under contract with Edwards AFB with program oversight provided by Environmental Management. Some waste generated from the proposed action could be recycled (e.g., concrete, asphalt, paving, and metals).

3.5 Biological Resources

The biological resources discussed include vegetation, wildlife, sensitive species, and habitats throughout Edwards AFB. Sensitive species include those that are listed by the United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), or Bureau of Land Management (BLM) as endangered, threatened, proposed for endangered or threatened status, or candidate species for endangered or threatened status. Plant species considered sensitive by the California Native Plant Society (CNPS) are also discussed in this analysis.

Field surveys of Edwards AFB were conducted in 1992 and 1993 to establish baseline biological resources data. Species-specific surveys were conducted for sensitive species, including the state and federally-listed (threatened) desert tortoise (*Gopherus agassizii*), state-listed (threatened) Mohave ground squirrel (*Spermophilus mohavensis*), and three CNPS 1B plants. These include desert cymopterus (*Cymopterus deserticola*), Barstow woolly sunflower (*Eriophyllum mohavense*), and alkali mariposa lily (*Calochortus striatus*). Random transect surveys were conducted within the five major plant communities to determine dominant and associated plant species, large and small mammal species, avifauna, and herpetofauna commonly found in the various plant communities (Mitchell et al., 1993). These surveys provide the baseline conditions used to evaluate the associated impacts from cultural resources management activities. These field surveys were repeated in 2003 for the 60 established Habitat Quality Analysis (HQA) study plots, 12 of which were resurveyed in 2004. Data collected from the 2003 surveys are being compared with the data from the 1992/1993 surveys to determine species population and diversity trends.

3.5.1 Regulatory Requirements/Guidance

The *Endangered Species Act of 1973* (16 U.S.C. 1531–1544) provides a framework for the protection of endangered and threatened species. Critical habitat is defined in the ESA as the geographic area containing physical or biological features essential to the conservation of a listed species or an area that may require special management considerations or protection.

The *Migratory Bird Treaty Act* (MBTA) of 1918 (16 U.S.C. 703–712), as amended, provides for federal protection of all migratory bird species, their active nests, and eggs. Permits are required to remove these birds and their nests from their roosting and nesting areas.

The *Sikes Act* (16 U.S.C. 670a–670o), as amended, provides for cooperation between the Departments of the Interior and Defense and state agencies in planning, developing, and maintaining fish and wildlife resources on military reservations throughout the United States.

The *California Endangered Species Act* (CESA) (California Fish and Game Code Section 2050 et seq.) generally parallels the main provisions of the federal ESA and is administered by CDFG. Under the CESA, the term “endangered species” is defined as a species of plant, fish, or wildlife that is in serious danger of becoming extinct throughout all, or a significant portion of its range, and is limited to species native to California. The CESA establishes a petitioning process for the listing of state-threatened or endangered species, and the CDFG is required to adopt regulations for this process. The CESA prohibits the taking of state-listed species except as otherwise provided in state law. Unlike the federal ESA, the CESA applies prohibitions to species petitioned for state listing (e.g., state candidates).

The *Animal Damage Control Act* (ADCA) (7 U.S.C. 426–426b), as amended, is administered by the Secretary of Agriculture and provides broad authority for investigation and control of mammalian predators, rodents, and birds.

The DOD Directive (DODD) 4700.4, *Natural Resources Management Program*, prescribes policies and procedures for an integrated management program of natural resources on DOD property. Enforcement of laws primarily aimed at protecting natural resources and recreation activities that depend on natural resources is an integral part of a natural resources program and shall be coordinated with, or under the direction of, the natural resources manager for the affected area.

Air Force Instruction 32-7064, *Integrated Natural Resources Management*, implements Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, and DODD 4700.4, *Natural Resources Management*. Air Force Instruction 32-7064 explains how to manage natural resources on Air Force property. The *Integrated Natural Resources Management Plan* (INRMP) is a key tool for managing the installation’s natural resources.

3.5.2 Vegetation Community

The base is described in terms of six major zonal habitats: creosote bush scrub, halophytic-phase saltbush scrub, *Hymenoclea Lygium* scrub (not considered a separate habitat in the 1992 to 1993 surveys), Joshua tree woodland, lakebeds, and xerophytic-phase saltbush scrub. The base also supports several azonal habitats such as clay pans, dunes, and mesquite woodlands. For a complete description of the habitats at Edwards AFB, see the *Integrated Natural Resources*

Management Plan Update (AFFTC 2004b) and the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al. 1993). These habitats support a variety of plants and animals. For a complete list of plant species at Edwards AFB, see *Plant Species of Edwards Air Force Base* (Charlton 2005).

3.5.3 Wildlife Community

The base provides habitat for typical desert wildlife species, for a list of known common animal species identified at Edwards AFB see the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al. 1993).

3.5.4 Endangered, Threatened, and Sensitive Species Community

Focused surveys have been conducted for several sensitive plant and wildlife species at Edwards AFB. Table 9 lists the species considered sensitive by the USFWS, CDFG, BLM, and/or the CNPS that are known to occur on base. This table also specifies the status of each species.

While there are several species of interest at Edwards AFB, training and exercise activities would have the potential to affect very few. The desert tortoise (*Gopherus agassizii*) is a large herbivorous reptile whose native range includes the Sonoran and Mojave deserts of southern California, southern Nevada, Arizona, extreme southwestern Utah, and Sonora and northern Sinaloa, Mexico. This species is listed by the USFWS and the CDFG as threatened. The desert tortoise is the only resident federally-listed species with legally required mandates on management practices.

In 1994, the USFWS designated portions of the base as “desert tortoise critical habitat” (USFWS 1994). Desert tortoise critical habitat encompasses approximately 60,800 acres in the eastern and southeastern portions of Edwards AFB on the PIRA (Figure 5). Some of the activities associated with the proposed project would occur within desert tortoise critical habitat.

The PIRA is divided into three management zones that roughly correspond with mission use. The heaviest use within the PIRA is designated zone 1. Approximately 4,480 acres of critical habitat are located within Zone 1. Activities within Zone 1 are not expected to preclude the recovery of desert tortoise in the western Mojave Desert. Approximately 25,960 acres of critical habitat fall within an area designated Zone 2, which supports moderate tortoise densities. The moderate level of activity currently occurring within this zone is expected to continue at its current rate. Zone 3 encompasses 30,360 acres of the PIRA and contains the highest tortoise densities on base. Zone 3 provides the highest level of desert tortoise protection, and very little activity occurs within this area. Zone 3 also includes the Mount Mesa area, an area designated by Edwards AFB as a desert tortoise buffer area.

The Mohave ground squirrel occupies a restricted range in the northwestern Mojave Desert in parts of San Bernardino, Los Angeles, Kern, and Inyo counties, California. This diurnal species is active aboveground only in spring and early summer before entering aestivation. This species is listed as threatened by the CDFG.

Table 9. Sensitive Species Confirmed At Edwards AFB

Scientific Name	Common Name	Federal Status	State Status	CNPS Status
Birds				
<i>Accipiter cooperi</i>	Cooper's Hawk	None	CS	NA
<i>Aquila chrysaetos</i>	Golden Eagle	Golden and Bald Eagle Act	CS	NA
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Federally threatened (FT)	SE	NA
<i>Buteo regalis</i>	Ferruginous Hawk	Bureau of Land Management/Forest Service sensitive (FSS)	CS	NA
<i>Circus cyaneus</i>	Northern Harrier	None	CS	NA
<i>Falco peregrinus anatum</i>	Peregrine Falcon	Delisted	SE	NA
<i>Falco mexicanus</i>	Prairie Falcon	None	CS	NA
<i>Asio flammeus</i>	Short-eared Owl	None	CS	NA
<i>Asio otus</i>	Long-eared Owl	None	CS	NA
<i>Speotyto cunicularia</i>	Burrowing Owl	None	CS	NA
<i>Chaetura vauxi</i>	Vaux's Swift	None	CS	NA
<i>Toxostoma lecontei</i>	Le Conte's Thrasher	None	CS	NA
<i>Lanius ludovicianus</i>	Loggerhead Shrike	None	CS	NA
Reptiles and Amphibians				
<i>Gopherus agassizii</i>	Desert Tortoise	FT	ST	NA
<i>Sauromalus obesus</i>	Chuckwalla	FSS	CS	NA
<i>Phrynosoma coronatum frontale</i>	California Horned Lizard	None	CS	NA
Mammals				
<i>Eumops perotis californicus</i>	California Mastiff Bat	None	CS	NA
<i>Euderma maculatum</i>	Spotted Bat	None	CS	NA
<i>Plecotus townsendii</i>	Townsend's Big-eared Bat	None	CS	NA
<i>Antrozus pallidus</i>	Pallid Bat	None	CS	NA
<i>Nyctimops macrotis</i>	Big Free-tailed Bat	None	CS	NA
<i>Nyctimops femorosaccus</i>	Pocketed Free-tailed Bat	None	CS	NA
<i>Spermophilus mohavensis</i>	Mohave Ground Squirrel	None	ST	NA
<i>Taxidea taxus</i>	American Badger	None	CS	NA
Plants				
<i>Calochortus striatus</i>	Alkali Mariposa Lily	None	None	1B
<i>Cymopterus deserticola</i>	Desert cymopterus	None	None	1B
<i>Eriophyllum mohavense</i>	Barstow Woolly Sunflower	None	None	1B
<i>Loeflingia squarrosa</i> var. <i>artemisiarum</i>	Sage-like Loeflingia	None	None	1B
<i>Astragalus preussii</i> var. <i>laxiflorus</i>	Lancaster Milkvetch	None	None	1B

Notes: 1. AFB–Air Force Base
2. CNPS–California species of special concern
3. CS–California species of special concern
4. NA–not applicable
5. SE–Listed as state of California endangered
6. ST–Listed as state of California threatened
7. 1B–Plants rare, threatened or endangered in California

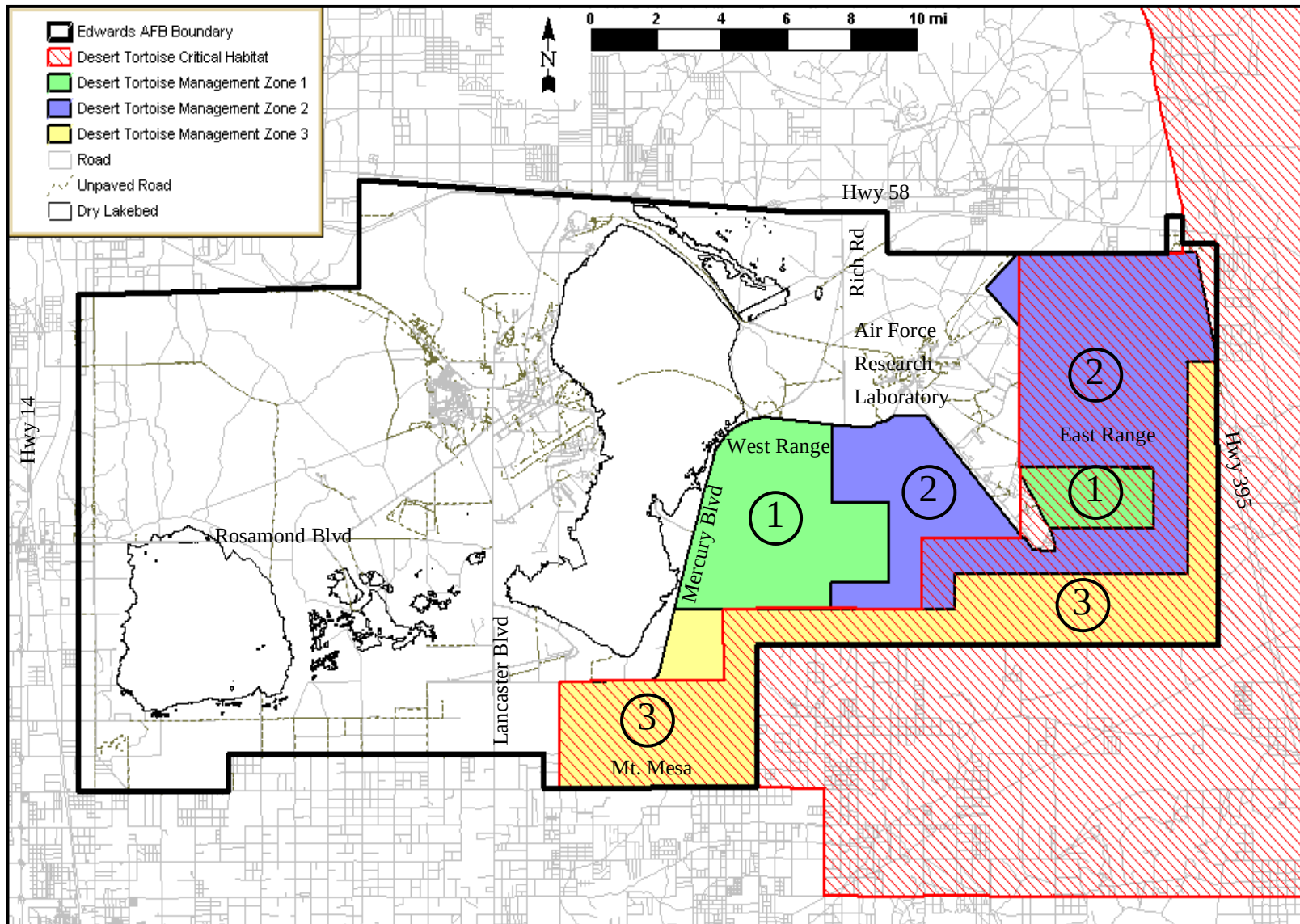


Figure 5. Desert Tortoise Critical Habitat and Management Zones on the Precision Impact Range Area

The burrowing owl is the only sensitive avian species potentially affected by training and exercise activities. This species is listed as a California species of special concern and is also protected by the MBTA.

Five sensitive plant species (CNPS 1B) are known to occur at Edwards AFB, desert cymopterus (*Cymopterus deserticola*), Barstow woolly sunflower (*Eriophyllum mohavense*), sage-like loeflingia (*Loeflingia squarrosa* var. *artemisarum*), Lancaster milkvetch (*Astragalus preussii* var. *laxiflorus*), and alkali Mariposa lily (*Calachortus striatus*). These plants are considered rare or endangered in California and elsewhere. Surveys conducted in 1995 identified several areas containing desert cymopterus, Barstow woolly sunflower, and alkali mariposa lily (Tetra Tech, Inc. 1995a, b, and c).

3.5.5 Sensitive Habitats

Sensitive habitats at Edwards AFB include plant communities that are unusual or of limited distribution and areas utilized seasonally by wildlife (e.g., migration routes, breeding areas, or critical seasonal habitat).

Numerous playas, claypans, and ephemeral pools support freshwater shrimp, hydrophytic vegetation, waterfowl, and shorebirds during seasonal inundation. Five species of freshwater shrimp have been identified including: clam shrimp (*Eocyclus digueti*), tadpole shrimp (*Lepidurus lemmoni*), and three species of fairy shrimp (*Branchinecta mackini*, *B. gigas*, and *B. lindahli*), (*Study of Freshwater Shrimp at Edwards Air Force Base, California*) (AFFTC 1992). For a list of bird species at Edwards AFB, see the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al. 1993).

The *Los Angeles County General Plan* (County of Los Angeles 1993) has identified two Significant Ecological Areas (SEAs) on base, Edwards AFB (SEA 47) and Rosamond Lake (SEA 50). Significant Ecological Area 47 contains botanical features that are unique and limited in distribution in Los Angeles County. They include the only good stands of mesquite (*Prosopis glandulosa*) in Los Angeles County. The area contains fine examples of creosote bush scrub, alkali sink, and the transition vegetation between the two. Mesquite woodlands provide habitat for a variety of mammals, birds, and reptiles.

Significant Ecological Area 50 is the best example of the shadescale scrub and alkali sink biotic communities in Los Angeles County. It also contains Piute Ponds in the southwestern corner of the base. Piute Ponds supports a variety of wildlife, especially birds. These ponds provide a stopover area for migratory birds.

3.6 Cultural Resources

Cultural resources are defined by AFI 32-7065, *Cultural Resources Management*, as any historical, archaeological, or American Indian artifacts and properties of interest. Cultural resources at Edwards AFB include archaeological resources (including those from prehistoric and historic periods), historic period resources (including structures and objects), and traditional cultural places.

As of August 2006, over 3,699 archaeological sites had been identified at Edwards AFB. Of these, 1,813 sites represent the prehistoric period, 1,740 date to the historic period, and 116 are historic-military related. Prehistoric period sites include villages, temporary camps, rock shelters,

milling stations, lithic deposits, quarries, cremations, rock features, and rock art. Historic period archaeological sites include refuse deposits, rock cairns, railroad grades, roads and trails, abandoned mines and homesteads, buildings and facilities, rock alignments, wells, and military sites. Of these, 1,060 sites have been evaluated for listing on the National Register of Historic Places (NRHP); 237 of these sites have been found eligible or potentially eligible for listing on the NRHP either on individual merit or as contributing elements of historic districts. There is one National Historic Landmark at Edwards AFB, which is in the northern portion of Rogers Dry Lake.

3.6.1 Regulatory Requirements/Guidance

The *National Historic Preservation Act* (NHPA) of 1966, as amended (16 U.S.C. 470 et seq.), provides for the establishment of the National Register and authorizes the establishment of criteria to determine the eligibility of cultural sites for listing on the National Register. Section 106 of the NHPA requires federal agencies to evaluate the effects of their activities and programs on eligible cultural resources (which include prehistoric and historic archaeological resources, historic resources, and traditional cultural places). Section 110 of the NHPA directs federal agencies to undertake actions necessary to minimize harm to cultural resources under their ownership or control, or affected by their activities and programs. Compliance with 16 USC 470 et seq., *NHPA*; 36 CFR 800, *Protection of Historic Properties*; and AFI 32-7065, *Cultural Resources Management*, at Edwards AFB is coordinated by the Base Historic Preservation Officer (BHPO).

The *Archaeological Resources Protection Act of 1979* (ARPA) (16 U.S.C. 469) was intended to address the growing concern about the plundering of archaeological and historic sites. The ARPA makes it illegal to remove any archaeological resources from federal or Indian lands without a permit. Violations of the ARPA can result in fines of up to \$250,000 and up to 5 years imprisonment.

The *Native American Graves Protection and Repatriation Act* (NAGPRA) (25 U.S.C. 3001 et seq.) requires federal agencies and institutions (e.g., museums) that receive federal funding to inventory their collections of American Indian human remains, funerary objects, sacred objects, and objects of cultural patrimony. American Indians must be given the opportunity to reclaim these items. The NAGPRA requires consultations with American Indians regarding the avoidance of archaeological burial sites. It requires halting excavation and consulting with representatives of local American Indian groups if a burial is encountered in the course of archaeological or other excavations. The NAGPRA also makes it illegal for anyone to buy or sell American Indian human remains or sacred objects.

The *American Indian Religious Freedom Act* (AIRFA) (42 U.S.C. 1996) establishes protection and preservation of traditional religions of American Indians.

The *Antiquities Act of 1906* (16 U.S.C. 431–433) prohibits the excavation of antiquities from public lands without a permit from the Secretary of the Interior.

The *Archaeological and Historical Preservation Act* (AHPA) of 1974 (16 U.S.C. 469–469c) requires all agencies to report to the Secretary of the Interior if any of their projects may cause the loss of “significant scientific, prehistorical, historical, or archaeological data.” The AHPA gives them the choice of recovering threatened data themselves or asking the Department of the Interior

to do it for them, and it authorizes them to transfer up to 1 percent of the cost of the project to the Department of the Interior to support salvage.

Air Force Instruction 32-7065, *Cultural Resources Management*, implements AFPD 32-70, *Environmental Quality*, and DODD 4710.1, *Archaeological and Historic Resources Management*.

Department of Defense Instruction 4715.3 *Environmental Conservation Program*, implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under DOD control.

3.6.2 Prehistoric Archaeological Resources

A number of American Indian groups are known ethnographically to have used the Antelope Valley, including Kawaiisu, Tataviam, Kitanemuk, and Vanyume or Desert Serrano. Additional information on these groups can be found in the *Cultural Resources Overview and Management Plan of Edwards AFB, California, Volume 1, Overview of the Prehistoric Cultural Resources* (Earle et al. 1997).

Prehistoric period sites include villages, temporary camps, rock shelters, milling stations, lithic deposits, quarries, cremations, rock features, and rock art. Through the NEPA process, any prehistoric cultural resources sites (archaeological sites) within project areas would be identified.

3.6.3 Historic Resources

Historic land use, in the Antelope Valley, was limited to exploration until the middle of the 19th Century. During the late 19th and early 20th Centuries, land use activity in the area that is now part of Edwards AFB, included mining and the development of railroads, ranches, and homesteads.

The town of Muroc, located on today's Main Base flightline just east of the Control Tower, was founded in 1909 by Clifford and Ralph Corum when they filed on Homestead No. 027819. The Corums sold land to other homesteaders for \$1 an acre. They established a general store, school, and post office. The town name of Muroc is the Corum name spelled backwards and was selected when the post office was established in 1910. Muroc was a railroad town associated with the Atchison, Topeka, and Santa Fe Railroad that ran from Mojave to Barstow across the dry lakebed. The town of Muroc existed until the early 1950s when the USAF purchased the land to expand Edwards AFB.

The area was first used by the military in 1928, and a bombing and gunnery range was formally established at Rogers Dry Lake in 1934. Edwards AFB, then known as Hap Arnold's Camp and later the Muroc Bombing and Gunnery Range, was established in 1934 as a bombing range (Wessel and Wessel 1991). The Muroc Bombing and Gunnery Range was operated out of a tent camp on the east shore of Rogers Dry Lake by March Field, Riverside, California.

In 1941, the Muroc Bombing and Gunnery Range headquarters moved to the west shore of Rogers Dry Lake (modern South Base), immediately south of the town site of Muroc. In 1942, Muroc Bombing and Gunnery Range was made a separate post, independent of March Field, and was renamed Muroc Army Air Base (Young 1987). It was renamed again in 1943, becoming

Muroc Army Air Field. The base provided advanced fighter and bombardment training for units prior to their deployment overseas during World War II and continued operations as a bombing and gunnery range.

In 1942, a separate facility, Muroc Flight Test Base (now known as North Base), was established to house and test the Bell XP-59A Airacomet, the first American jet aircraft. Later, in 1943, the SP-80 program moved into the test base. The Lockheed XP-80 Shooting Star became the first American jet aircraft to see combat (Hudlow 1995).

In 1947, the bombing range, by then known as Muroc Army Air Field, was combined with Muroc Flight Test Base to form Muroc AFB (Hudlow 1995). The base's bombing range function was largely abandoned after World War II in order to continue flight test programs. In 1949, Muroc AFB was renamed Edwards AFB in commemoration of Captain Glen W. Edwards, who was killed flying second seat to Major Daniel Forbes in a Northrop YB-49 Flying Wing (Young 1987). In the mid-1950s, the majority of base operations moved to new facilities constructed at what is now Main Base (Young 1984). Additionally, associate organizations at the rocket laboratory (now AFRL) and the former Jet Propulsion Laboratory developed rocket engines for the country's manned and unmanned space programs (Hudlow 1995; Komporelides et al. 1996).

Evidence of the Edwards AFB's military history can still be found. The range contains several examples of World War II bombing targets, and the hangar that housed the XP-59A program still stands at North Base. Other examples include the X-15 complex where the X-15 engines were tested, the loading pit for the Bell X-1, and Test Stand 1A that was used to test the rocket engines that took Americans to the moon. Many of these facilities are still used today to test the Nation's next generation of historic aircraft and rockets.

Through the NEPA process, any historic cultural resources sites (archaeological sites) within project areas would be identified.

3.7 Geology and Soils

Geologic resources consist of naturally formed minerals, rocks, and unconsolidated sediments. Soil refers to the uppermost layers of surficial geologic deposits and is developed by the weathering of those deposits. Concerns associated with the geologic setting at Edwards AFB, which could either affect or be affected by a proposed project, include topography, ERP site disturbance, seismicity, and land subsidence.

3.7.1 Regulatory Requirements/Guidance

The CERCLA (42 U.S.C. 9601) was enacted by Congress on 11 December 1980. The CERCLA provides a broad federal authority to respond directly to releases or threatened release of hazardous substances that may endanger public health or the environment. The CERCLA authorizes short-term removal actions and long-term remedial response actions. The CERCLA establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup on non-DOD property when no responsible party can be identified.

The RCRA (42 U.S.C. 6901) was enacted into law in 1976 and is administered by the U.S. EPA. It regulates the handling, transport, storage, treatment, and disposal of solid and

hazardous waste. It places responsibility for hazardous waste on facilities generating the waste and requires them to meet the various standards regarding personnel training, facility inspections, waste identification and analysis, emergency response planning, and recordkeeping.

In September 1990, the Air Force, along with the U.S. EPA, Region IX; the California Department of Health Services (now referred to as the Cal/EPA, Department of Toxic Substances Control [DTSC] and the California Regional Water Quality Control Board [RWQCB], Lahontan Region), signed an FFA. The FFA requires compliance with the *National Oil and Hazardous Substances Pollution Contingency Plan* (40 CFR 300), CERCLA, RCRA, and applicable state laws. Under Section 6.2 of the FFA, the Air Force agreed to undertake, seek adequate funding for, fully implement, and report on the following tasks: remedial investigation of sites; federal and state Natural Resource Trustee Notification and Coordination for the sites; feasibility studies for all sites; all response actions for the sites; and operation and maintenance of response actions at the site.

3.7.2 Topography

The United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), has completed a soil survey of Edwards AFB for the USACE. The *Grazing and Cropland Management Plan for Edward Air Force Base, California* (USACE 1997) describes results of the soil survey that was conducted by the USDA. Based on this survey, the soils at Edwards AFB can be characterized as predominantly alkaline, consisting of loams, sandy loams, and loamy sands, all of which are susceptible to wind and water erosion. According to the *Interim Soil Survey of Edwards Air Force Base, California*, (USDA Soil Conservation Service [SCS] 1998), the soils at Edwards AFB is given erosion hazard ratings of slight-to-severe for wind erosion and slight-to-moderate for water erosion.

The geologic setting in the vicinity of the Edwards AFB area is characterized by three major rock types or geologic complexes: a basement complex of igneous and metamorphic rocks; an intermediate complex of continental volcanic and sedimentary rocks; and valley fill deposits. The basement complex is of pre-Tertiary age and includes quartz monzonite, granite, gneiss, schist, and other igneous and metamorphic rocks. These rocks crop out in the highlands surrounding the playa areas and occur beneath the unconsolidated deposits of the playa. The intermediate complex, with limited exposure in the Edwards AFB vicinity, is of Tertiary age and includes a variety of sedimentary and volcanic rock types (Dutcher and Worts 1963).

3.7.3 Environmental Restoration Program Remediation Disturbance

Soil and groundwater are susceptible to contamination. Releases of hazardous chemicals, such as petroleum products and solvents, have created soil and groundwater contamination at military installations. Contaminated soil and/or groundwater may require physical removal or extensive remediation to ensure the protection of public health and safety.

The ERP was established to identify, investigate, assess, and clean up hazardous waste at former disposal sites on the base in compliance with the CERCLA. Under the ERP, a preliminary assessment was conducted at Edwards AFB to locate potential areas of concern (AOCs) that may have resulted from past activities on the 301,000-acre base.

Remediation efforts usually involve extraction and/or monitoring wells that are drilled to groundwater, or deeper, and are located throughout the contaminated groundwater plume. Extraction wells can extract both groundwater and air from the unsaturated zone. They are connected by a series of underground or aboveground pipes that convey air, water, and compressed air (for pneumatic pumps located within the wells). The extracted material is then piped to a treatment compound where equipment is located to treat the incoming vapors and liquids. The treatment compound will have some connections for electricity, natural gas, and sewer hookups. Monitoring wells were installed to observe the condition of the groundwater within a specific location. Well locations are usually selected on the basis of known or expected hydrologic, geologic, and water quality conditions and the location of pollutant or contaminant sources. The Environmental Management Restoration Branch schedules and conducts remediation efforts for the ERP. Many of the systems are in construction or planning phases. Any project or activity planned in an ERP site undergoing, or scheduled for, remediation would be scheduled to avoid conflicts with ERP timelines and requirements. This process ensures that equipment is not damaged and program efforts are not negatively affected by the proposed project or activity.

3.7.4 Seismicity

The geologic and structural development of the vicinity surrounding Edwards AFB has been measurably affected by tectonic activity. The Mojave Structural Block is wedged between two major intersecting shear zones: the northeast trending Garlock Fault, which controls the trend of the Tehachapi Mountains to the northwest of Edwards AFB, and the northwest trending the San Andreas Fault system, which bounds the San Gabriel Mountains to the south. Both fault zones have had substantial activity in the Quaternary period. The San Andreas Fault zone is the more dominant of the two, with a known length of about 600 miles and right-lateral displacement of up to 350 miles. The Garlock Fault zone is traceable for more than 150 miles and has left-lateral displacement (Weston 1986).

Like much of southern California, Edwards AFB is subject to earthquake activity and associated seismic hazards. At least eight minor faults are known, or are suspected due to their trends, to be present within the boundaries of Edwards AFB; however, no fault has been active in the last 11,000 years. A local fault seismicity map shows the surface traces of these faults (Figure 6).

3.8 Socioeconomics

Socioeconomic resources are the economic, demographic, and social assets of a community. Key elements include fiscal growth, population, employment, housing, schools, and environmental justice.

For the purpose of this EA, those counties, or portions of counties, in which the proposed action would occur, define the boundary of the socioeconomic environment. The economic impact region (EIR) includes all areas within this boundary. The EIR for an impacted community is fundamentally important to the analysis because it defines the area in which changes in fiscal growth, population, labor force and employment, housing stock and demand, and school enrollment will be assessed. The EIR for Edwards AFB is that area located within 75 miles of Main Base, and includes portions of Los Angeles, Kern, and San Bernardino counties. However, a majority of potential socioeconomic impacts from base activities would be expected to occur within the Antelope Valley area (Figure 7).

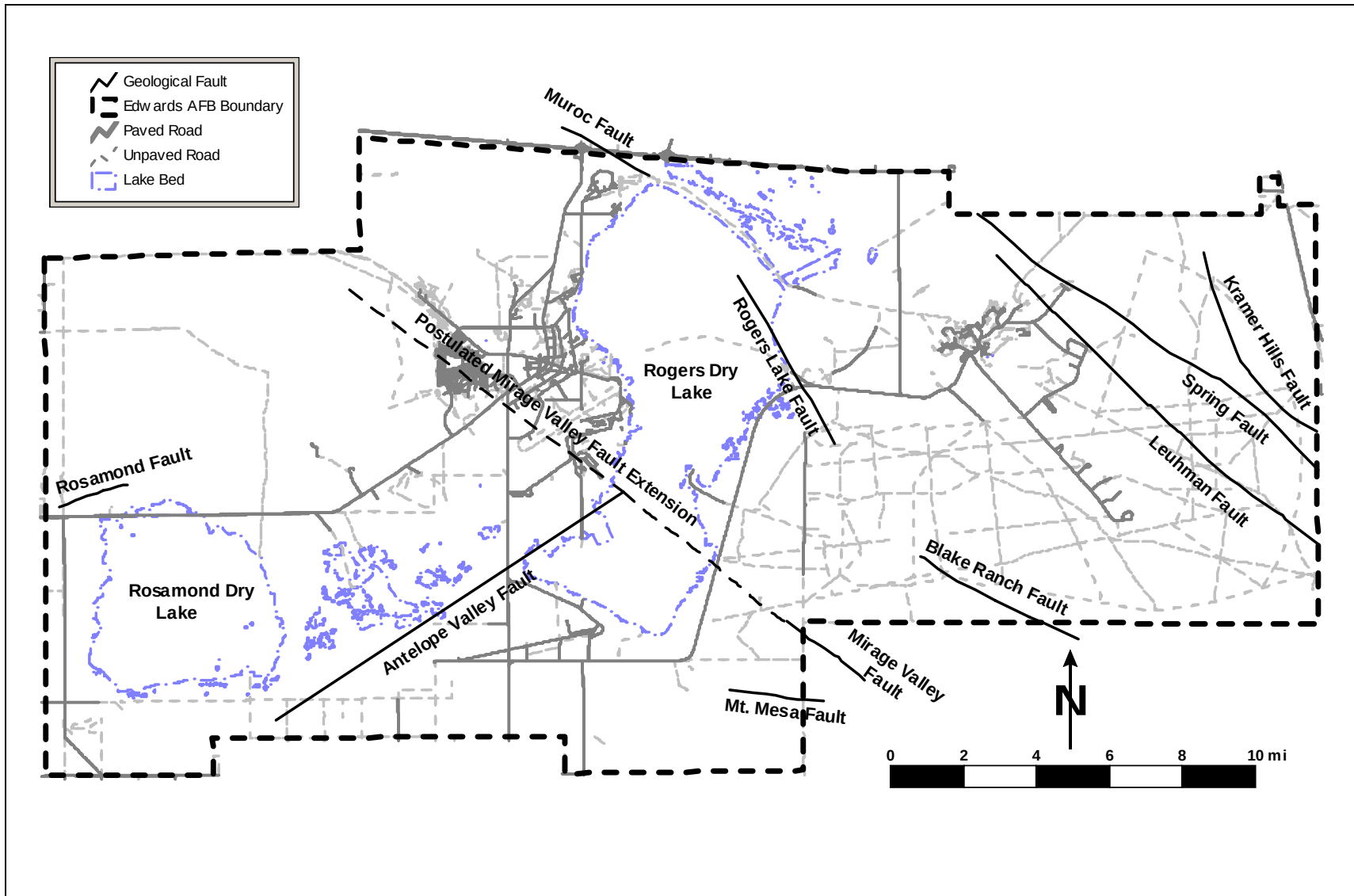


Figure 6. Local Faults Seismicity Map

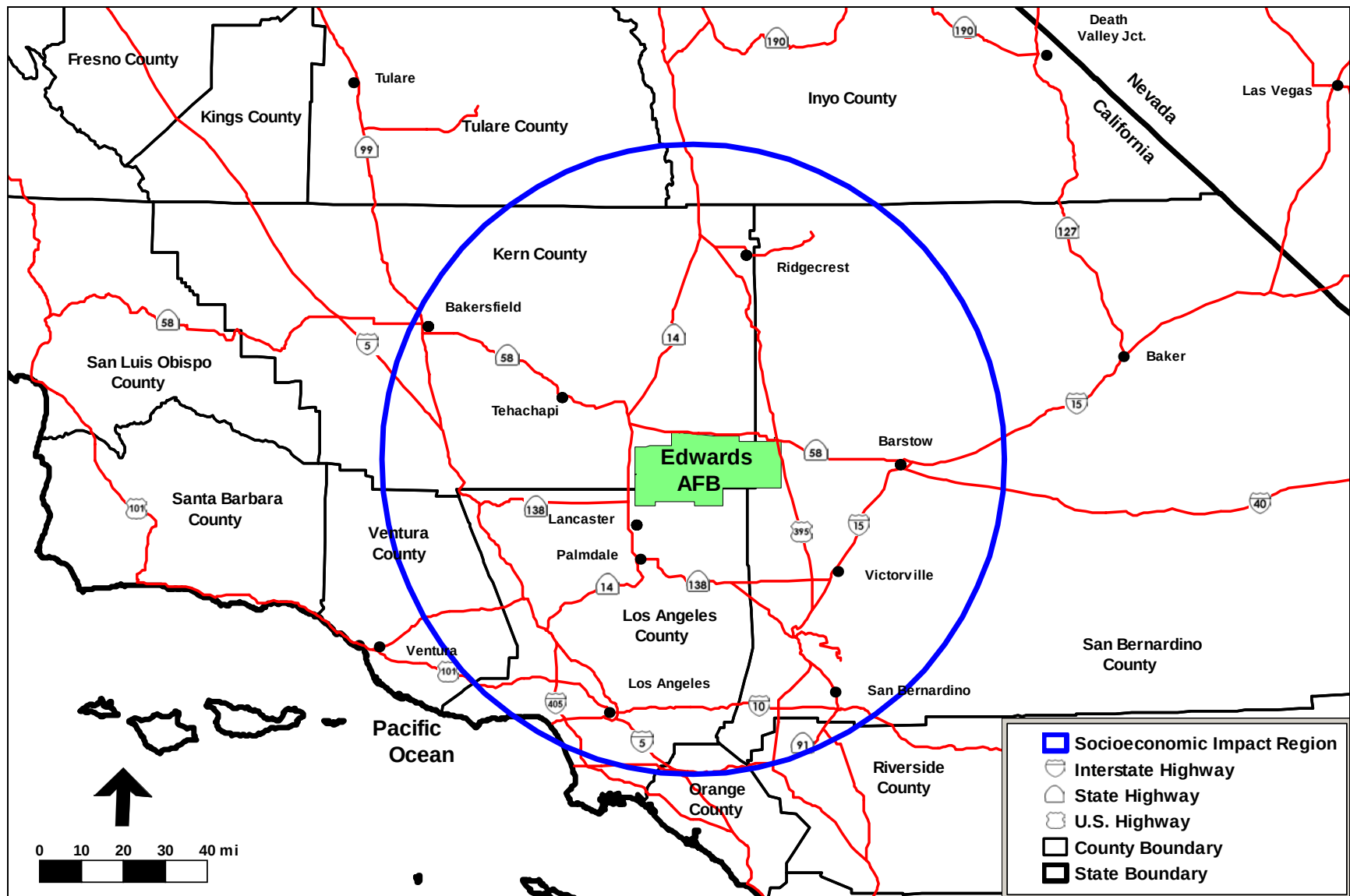


Figure 7. Socioeconomic Impact Region

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Land Use

4.1.1 Alternative A Impacts (Proposed Action)

4.1.1.1 On-Base Land Use

The proposed project would be located at various locations basewide. The majority of training and exercise activities would occur in the populated areas of the base. Because no facilities or organizations would be permanently sited on the base, no significant impacts to on-base land use are anticipated.

4.1.1.2 Airfield Operations

The proposed project may include activities on the flightline. All activities would be conducted in accordance with applicable AFIs, including those listed in Section 3.1.1. Project activities will be coordinated with Airfield Management; therefore, no significant impacts to airfield operations are anticipated.

4.1.1.3 Foreign Object Damage Control

Material or debris, such as nuts, bolts, screws, wood, trash, or pieces of concrete or asphalt may end up on runway, taxiways, or apron as a result of exercise and training activities. These objects could puncture tires, damage engines, or be blown by helicopter rotor downwash. This could cause damage to aircraft and helicopters and possible injury or death to personnel. However, continued implementation of standard practices and existing policies would reduce the potential for these impacts. Therefore, no significant impact is anticipated as a result of FOD.

4.1.1.4 Noise (Annoyance)

Exercise and training activities may occur on the Main Base flightline. Exercise and training activities could potentially expose personnel to increased noise levels by aircraft and helicopter operations, engine testing, and the operation of powered tactical support equipment (TSE). However, the use of AFOSH and OSHA hearing protection would reduce the potential for these impacts. Therefore, no significant impacts are anticipated.

4.1.1.5 Direct/Indirect Effect

Training and exercise activities would not have a direct effect on land use because they will occur in established areas and will be temporary in nature. Training and exercise activities located in the flightline area would have an indirect effect by increasing the potential for FOD hazards.

4.1.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required for Alternative A.

a. The proposed action shall comply with all regulations and instructions regarding airfield operations including, but not limited to, AFFTCI 11-2, *Ground Agency Operations*. Contact Airfield Management for more information regarding these regulations and instructions.

b. All project personnel shall use standard operating procedures for the prevention of FOD as identified in AFI 21-101, *Aerospace Equipment Maintenance Management*. In addition, AFJMAN 24-306, *Manual for the Wheeled Vehicle Driver*, and AFFTCI 10-2, *Control of Vehicles on the Airfield*, shall be followed.

c. Activities on the flightline have the potential to leave objects on taxiways or runways that could cause damage to aircraft and interrupt flightline operations. The proponent/contractor shall contact Airfield Management for FOD reduction guidelines.

d. To avoid mission-related conflicts, new construction, renovation, or demolition activities on the flightline require 10 to 14 days advance notice to Airfield Management for any activity within flightline boundaries. The proponent/contractor shall contact Airfield Management for coordination requirements.

e. All personnel present within hazardous noise areas as stated in AFOSH Standard 48-19, *Hazardous Noise Program*, shall follow the applicable hearing protection guidelines.

4.1.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to land use would be the same as Alternative A.

4.1.4 Alternative B Minimization Measures

The following minimization measures are required for Alternative B.

a. The proposed action shall comply with all regulations and instructions regarding airfield operations including, but not limited to, AFFTCI 11-2, *Ground Agency Operations*. Contact Airfield Management for more information regarding these regulations and instructions.

b. All project personnel shall use standard operating procedures for the prevention of FOD as identified in AFI 21-101, *Aerospace Equipment Maintenance Management*. In addition, AFJMAN 24-306, *Manual for the Wheeled Vehicle Driver*, and AFFTCI 10-2, *Control of Vehicles on the Airfield*, shall be followed.

c. Activities on the flightline have the potential to leave objects on taxiways or runways that could cause damage to aircraft and interrupt flightline operations. The proponent/contractor shall contact Airfield Management for FOD reduction guidelines.

d. To avoid mission-related conflicts, new construction, renovation, or demolition activities on the flightline require 10 to 14 days advance notice to Airfield Management for any activity within flightline boundaries. The proponent/contractor shall contact Airfield Management for coordination requirements.

4.2 Air Quality

4.2.1 Alternative A Impacts (Proposed Action)

Short-term degradation in air quality may be experienced during training and exercise activities. Fugitive dust emissions (PM₁₀) could be generated through ground vehicle and aircraft traffic. Use of associated motor vehicles, equipment, and potential motor vehicle delays

at the gates could cause degradation in air quality from engine emissions. However, through preliminary calculations, it has been determined that this will not exceed *de minimis* levels. Therefore, no significant impacts are expected.

The proposed action could involve the use of equipment over 50 bhp. If such equipment remains on base for more than 45 days, an air quality operational permit is required from the KCAPCD, MDAQMD, AVAQMD, or CARB.

Toxic air emissions regulated under Assembly Bill (AB) 2588 may be generated as a result of training and exercise activities, including operation of portable or stationary ICEs, painting operations, and/or the use of solvents, cleaners, and adhesives. These emissions would require inclusion in the biannual Toxic Emissions Inventory Report provided to the KCAPCD, MDAQMD, AVAQMD, or CARB by Edwards AFB. This would ensure compliance with AB 2588 implementing regulations. No significant impacts are expected from implementation of the proposed project.

Total air emissions for the proposed action from all sources (mobile and stationary) would be calculated on a project specific basis. Portions of this action may qualify for exemptions under 40 CFR 51.853/93.153(c)(2)(xiii) and (d)(3). The exemptions are as follows:

- a. Routine operation of facilities, mobile assets, and equipment.
- b. Research, investigations, studies, demonstrations, or training (other than those exempted under Paragraph (c)(2) of 40 CFR 51.853/93.153), where no environmental detriment is incurred and/or, the particular action furthers air quality research, as determined by the state agency primarily responsible for the applicable State Implementation Plan.

A copy of the conformity letter can be found in Appendix A. Also located in Appendix A, are preliminary emission calculations for potential congestion of vehicles at the base entry gates. These calculations are *de minimis* under 40 CFR 51.853/93.153(b)(1). The proposed action would comply with all applicable federal, state, and local laws and regulations. Compliance with the minimization measures listed in Section 4.2.2 would further reduce anticipated impacts due to criteria pollutant or ozone precursor pollutant air emissions. Therefore, no significant impacts are expected.

The relevant and applicable *de minimis* levels for criteria pollutant emissions in all air districts are already less than the corresponding 10-percent regional planning emission inventory threshold values. The proposed action has emissions that are below *de minimis* levels, and changes in *de minimis* level emissions are not expected from training and exercise activities. Thus, the proposed action would not have a regionally significant impact in the KCAPCD, MDAQMD, AVAQMD, or CARB.

4.2.1.1 Direct/Indirect Effects

Training and exercise activities would directly affect local air emission levels. However, based on preliminary air emission calculations, and air exemption potential, emission levels would be at or below *de minimis* levels. Regional air quality values would not be affected.

4.2.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended for Alternative A.

- a. The project shall comply with all applicable KCAPCD, MDAQMD, AVAQMD and, CARB rules and regulations.

b. Any stationary sources associated with the proposed project shall comply with all AB 2588, *Air Toxics "Hot Spots" Information and Assessment Act* requirements, including revision of existing emission inventory plans and/or health risk assessments.

c. The proposed project shall comply with all applicable rules and regulations as identified in AFI 32-7040, *Air Quality Compliance*.

d. Air quality operational permits are required for ICEs over 50 bhp rating (e.g., welders, generators, and compressors) and operated at Edwards AFB for more than 45 calendar days. If such equipment is to remain on base less than 45 calendar days, then a written exemption shall be obtained from the local air agency.

e. The proposed project shall comply with all CAA Title III HAP requirements, or any more stringent state or local requirements as they apply to stationary sources that emit HAPs.

f. The proposed project shall comply with all BACT standards specified in 40 CFR 60, *Standards of Performance for New Stationary Sources*.

g. All vehicles transporting clean fill material or construction debris require a cover to reduce PM10 emissions during transport.

h. All earthwork activities shall be planned and conducted to minimize the duration that soils would be left unprotected. The extent of the area of disturbance necessary to accomplish the project shall be minimized. Exposed surfaces should be periodically sprayed with water.

i. Ground-disturbing activities shall be delayed during high-wind conditions (over 25 mph).

j. All mechanical equipment shall be kept in working order according to applicable technical orders and equipment maintenance manuals to reduce emissions to acceptable levels.

k. All construction equipment and vehicles shall comply with applicable emission standards for 1996 or newer engines.

4.2.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to air quality would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.2.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.3 Safety and Occupational Health

4.3.1 Alternative A Impacts (Proposed Action)

4.3.1.1 Exposure Hazards

Elements of the proposed project can pose health and safety issues for personnel during proposed training and exercise activities. Some exercise and training activities may be located in areas that would expose personnel to increased noise levels that may be above acceptable levels established by AFOSH and federal and state OSHA regulations. There is also the potential for

inhalation exposure to asbestos-containing material (ACM) and/or lead based paint (LBP) if any proposed training and exercise activities involve disturbance to buildings, structures and/or existing utility lines. Compliance with the measures listed in Section 4.3.2 would minimize health and safety hazards to personnel.

Training and exercise activities have the potential to expose personnel to conditions that can cause heat stress or hypothermia from exposure, venomous snake and spider bites, or contract hantavirus and/or valley fever from exposure to soils hosting spores. Compliance with all applicable laws, regulations, and HASPs will minimize health and safety hazards to personnel.

4.3.1.2 Explosives, Ordnance, and Weapons Safety

Any live ammunition used for training or exercises would be stored in accordance with AFI 91-201, *Explosives Safety Standards*.

4.3.1.3 Direct/Indirect Effects

Some training and exercise activities would have the direct effect of potentially exposing personnel to hazardous noise levels, hazardous materials (including propellants and munitions), and hazardous environmental conditions (ACM and LBP). Using appropriate protective measures for noise, hazardous material management, and contacting the Asbestos Operation Office for ACM/LBP survey information, would assist in determining how to minimize the potential risks to human health. Training and exercise activities would indirectly affect safety and occupational health through the process of educating and preparing personnel in proper safety and occupational health procedures.

4.3.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended for Alternative A.

- a. All personnel present within hazardous noise areas as stated in AFOSH Standard 48-19, *Hazardous Noise Program*, shall follow the applicable hearing protection guidelines.
- b. When training and exercise activities are located within the PIRA, personnel shall coordinate project activities with downfall.
- c. Due to the type of operations conducted on and within the PIRA, there is a potential to encounter live and nonexpended ordnance. If material suspected to be hazardous is found during project activities, personnel shall notify downfall.
- d. Compliance with all applicable OSHA, AFOSH, and Cal/OSHA rules and regulations will minimize exposure hazards to personnel. Follow HASP procedures for exposure conditions.
- e. While tying into existing utilities or disturbing facilities there is the potential for exposure to ACM and/or LBP. Contact the Asbestos Operation Office for ACM/LBP survey information and mitigation requirements.
- f. The *Asbestos Notification Act* requires building occupants be notified of the presence of asbestos. Contact the Asbestos and Lead Operations Officer at (661) 277-3803 or 277-4475 for information regarding the presence and locations of ACM and LBP.

g. Live ammunition used for training or exercises would be stored in accordance with AFI 91-201, *Explosives Safety Standards*.

h. The proposed project shall comply with the standards, instructions, and regulations listed in Section 3.4.1 applicable to the proposed project.

4.3.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to safety and occupational health would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.3.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.4 Hazardous Materials and Waste

4.4.1 Alternative A Impacts (Proposed Action)

4.4.1.1 Hazardous Materials

The types and quantities of hazardous materials that may be used during training and exercise activities would not be different from those already used on base. Some training and exercise activities may involve the use of explosives or munitions. Compliance with all applicable standards and/or regulations addressing explosive and munitions and hazardous materials management is required and would ensure proper handling, use, and storage of these substances on base. Therefore, no significant adverse impact is anticipated as a result of hazardous materials.

4.4.1.2 Hazardous Waste

The types and quantities of hazardous wastes generated during training and exercise activities would not be different from those already generated on base. This includes possible explosives or munitions from training and exercise activities. Compliance with all applicable standards and/or regulations addressing hazardous waste management is required and would ensure proper handling, storage, and disposal of hazardous wastes generated on base. Standard operating procedures identified in the Edwards AFB HWMP governing the control of hazardous waste, would prevent the creation of new contamination sites. Therefore, no adverse impact is anticipated as a result of hazardous waste.

4.4.1.3 Solid Waste

This alternative would create some solid waste during training and exercise activities. Personnel would be required to dispose of all solid waste and trash at an approved state-licensed landfill. No significant adverse impact to on- or off-base landfills would be anticipated due to the relatively small quantity of waste generated by the proposed project.

4.4.1.4 Direct/Indirect Effects

Training and exercise activities would have a direct effect on the occasional use of hazardous materials and the generation of hazardous waste. The use of hazardous materials such as paints, solvents, and petroleum products, including lubricants, during some training and exercise activities would be no different than those already in use on base.

4.4.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended for Alternative A.

a. In accordance with 29 CFR 1910.1200 on hazard communication, all hazardous materials would be documented with required MSDSs as part of a complete hazardous materials inventory. A copy of the inventory and all pertinent MSDSs shall be submitted to Bioenvironmental Engineering in support of the *Base Hazardous Materials Program* and *Air Force Hazard Communication Program* (AFOSH Standard 48–21).

b. The Base Director of Safety shall be notified at least 48 hours prior to hazardous materials off-loading.

c. Any hazardous waste generated during training or exercise activities shall be handled in accordance with applicable regulations: 49 CFR 171–177, *Waste Transportation and Packaging*; 40 CFR 260–299, *Storage, Treatment, and Disposal of Waste*; AFI 32–7042, *Solid and Hazardous Waste Compliance*; and the Edwards AFB HWMP (AFFTC 1999a).

d. This project may generate solid waste. The proponent/contractor shall be responsible for transporting solid waste to a state-licensed facility.

e. The contractor should segregate any recyclable and reusable materials from solid waste for delivery to the appropriate recovery or disposal facilities. The 95th Civil Engineering Directorate, Group Environmental Office, should be contacted regarding recyclable debris.

4.4.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to hazardous materials and hazardous waste would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.4.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.5 Biological Resources

4.5.1 Alternative A Impacts (Proposed Action)

The proposed action could affect biological resources through the alteration or loss of vegetation and wildlife habitat and the potential for loss of individual desert tortoises, Mohave ground squirrels, burrowing owls, or sensitive plant species.

The NEPA screening process would provide a methodology to ensure compliance with the natural resources laws and regulations affecting biological resources at Edwards AFB. The level of impact and minimization measures for biological resources is determined by considering the:

- a. Unique characteristics of biological resources, such as ecologically sensitive areas, or species;
- b. Legal requirements for the affected resource;
- c. Extent to which the proposed action would add to present and future disturbances in the area; and
- d. Potential of the affected resource to recover through natural population, habitat recovery, or artificial means, such as revegetation.

4.5.1.1 Vegetation Community

Exercise and training activities may involve off-road vehicle (ORV) traffic. Off-road vehicle traffic is known to cause soil compaction, increased soil erosion, and a reduction in seedling establishment (Kakiba and Vogl 1986). Any ground-disturbing activities may result in changes in plant diversity, density, and cover. These changes would be dependent upon the intensity and frequency of exercise and training activities and local environmental conditions such as topography, climate, and soil type (Kakiba and Vogl 1986).

Impacts to sensitive vegetation areas could be minimized through coordination with Environmental Management and the NEPA process.

4.5.1.2 Wildlife Community

Exercise and training activities which occur on parts of the PIRA, are within critical desert tortoise habitat. Within critical habitat, desert tortoise population densities are higher than those typically found in other areas on base. Exercise and training activities also have the potential to negatively impact areas within critical habitat through temporary and/or permanent habitat disturbance. These impacts may be direct by physically injuring, or killing; indirect would be by disturbing habitat or otherwise creating conditions that are adverse to species success.

Impacts to the wildlife community could be minimized through coordination with Environmental Management and the NEPA process.

4.5.1.3 Endangered, Threatened, and Sensitive Species Community

Off-road vehicle traffic, associated with exercise and training activities, may impact desert tortoises, as well as other ground-dwelling species. These impacts may be direct by physically injuring or killing individuals, or indirect by disturbing habitat or otherwise creating conditions that would adversely affect the species' ability to survive and reproduce.

Personnel may encounter birds and their nests during activities in support of the exercise and training activities. Common bird species such as the common raven (*Corvus corax*), house finch (*Carpodacus mexicanus*), and barn owl (*Tyto alba*) typically nest and roost in, on, or near manmade structures. These species, as well as many others, are protected under the MBTA (see table 7).

Sensitive plant species (see Table 7) may be impacted by exercise and training activities (e.g., during ORV and aircraft activities). Impacts could be minimized through coordination with Environmental Management and the NEPA process.

4.5.1.4 Direct/Indirect Effects

Exercise and training activities would have a direct impact on vegetation and wildlife habitat including the potential for loss of individual desert tortoises, Mohave ground squirrels, burrowing owls, or sensitive plant species. These activities could also indirectly impact wildlife through the disturbance of wildlife habitat. Impacts could be minimized through coordination with Environmental Management and the NEPA process.

4.5.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required for Alternative A:

a. Personnel shall adhere to the terms and conditions of the following applicable biological opinion. This includes a desert tortoise briefing prior to the start of any project activities.

(1) *Biological Opinion for Routine Operations and Facility Construction within the Cantonment Areas of Main and South Bases, Edwards Air Force Base, California* (1-6-91-F-28) (USFWS 1991).

(2) *Biological Opinion for the Precision Impact Range Area, Edwards Air Force Base, California* (1-8-94-F-6) (USFWS 1994).

(3) *Biological Opinion for the Development and Operation of Eight Pits Throughout the Air Force Flight Test Center in Kern, Los Angeles, and San Bernardino Counties, California* (1-8-96-F-56) (USFWS 1996)

(4) *Biological Opinion for Rocket Motor Testing Program and Support Activities at Phillips Laboratory, Edwards Air Force Base, California* (1-8-97-F-10) (USFWS 1997).

(5) *Biological Opinion for Reinitiation of Formal Consultation – Routine Operations, Construction Projects, and Facility Maintenance of Roads, Utilities, and the Runway at the Jet Propulsion Laboratory and North Base Areas of the Air Force Flight Test Center* (1-8-98-F-21R) (USFWS 1998a).

(6) *Biological Opinion for the Prime Base Emergency Engineering Force Training Area, Edwards Air Force Base, California* (1-8-93-F-35) USFWS 1998b).

b. The following are typical terms and conditions contained in the various Biological Opinions, but are not necessarily all the requirements.

(1) An education program on the desert tortoise and its status as a listed species shall be presented to personnel, prior to initiating work or activities.

(2) Preactivity surveys shall be conducted by a qualified biologist in areas containing native vegetation, when necessary, prior to ground-disturbing activities.

(3) If any desert tortoises or their burrows are encountered, they shall be avoided to the maximum extent feasible. If avoidance is not possible, a qualified biologist shall excavate burrows and relocate desert tortoises if allowed and possible.

(4) All personnel shall inspect under vehicles prior to operation. If desert tortoises are discovered under parked vehicles, an authorized biologist shall be notified immediately so animals can be relocated to a nearby, safe location. Otherwise, the vehicle shall remain in place until the desert tortoise has moved to a safe location by an authorized biologist.

(5) Laydown, parking, and staging areas shall be restricted to previously disturbed areas to the maximum extent possible.

(6) All trash and food items shall be promptly contained and regularly removed from project sites to reduce the attractiveness of the areas to common ravens (*Corvus corax*) and other desert tortoise predators.

(7) Open excavations created during project activities shall be secured at the end of each day by backfilling, placing a cover over the excavation, installing temporary desert tortoise Natural Resources-approved fence, and or by creating a 3:1 slope at the ends of the ditch. Excavations left unsecured during the workday shall be checked three times per day (morning, mid-day, and late afternoon) for trapped animals. If any animals are found in an excavation, notify Environmental at (661) 277-1401 immediately.

c. In the event that a project is not covered under an existing biological opinion, a No Effect Memorandum or consultation with the USFWS shall be required.

d. Structures within the project area may be surveyed for the presence of nesting birds and or bats prior to the start-of-work activities. A biological monitor may be required. If nesting birds are discovered during work activities, all work that may disturb nesting birds must stop at the location of the nest and the proponent/contractor must immediately contact Environmental Management and the contracting officer. Federal employees and contractors are potentially subject to criminal liability and must possess a permit to conduct a depredation activity.

e. A preactivity survey may be necessary to determine the presence or absence of sensitive plant species, when necessary, prior to any ground-disturbing activities. A biological monitor may be required during ground-disturbing activities.

f. The submittal of an AF Form 813, *Request for Environmental Impact Analysis*, would be required to properly analyze potential environmental impacts to biological resources.

4.5.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to biological resources would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.5.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.6 Cultural Resources

4.6.1 Alternative A Impacts (Proposed Action)

Exercise and training activities have the potential to impact archaeological sites and historic building sites during ground-disturbing activities, demolition, or renovation of structures throughout the base. The potential for impacts exists both for areas where sites have been identified and for areas which have not yet been surveyed for cultural resources. Exercise or training activities at or near identified sites could result in adverse effects. In addition, ground-disturbing, renovation, or demolition activities in areas which have not been surveyed, could also result in adverse effects.

The NEPA screening process would provide a methodology to ensure compliance with the cultural resources laws and regulations affecting cultural resources at Edwards AFB. It is anticipated that during the planning process of exercise and training activities, avoidance of any cultural concerns can be accomplished; thereby, avoiding any negative direct impacts to cultural resources.

4.6.1.1 Direct/Indirect Effects

Any exercise or training activities that may damage or destroy eligible or nonevaluated cultural resources sites, would create a negative direct effect. Section 106 evaluation conducted at these sites to determine NRHP eligibility and mitigation efforts on eligible sites prior to training or exercise activities, would minimize these negative direct effects. Positive indirect effects of training or exercise activities would occur if archaeological sites are evaluated as mitigation to significant adverse impacts. This evaluation would accomplish an increase in knowledge of the sites.

It is anticipated that during the planning process of exercise and training activities, early coordination with the BHPO through the NEPA process would allow the avoidance or mitigation of cultural concerns; thereby, avoiding any negative direct impacts to cultural resources.

4.6.2 Alternative A Minimization Measures

The following minimization measures are required for Alternative A.

a. As early as possible during the planning phase for training and exercise activities, the NEPA screening process would determine if there are any potential cultural resource concerns to be mitigated through coordination with the BHPO.

b. Based on available information, the BHPO may recommend either a cultural resource investigation (Phase I, II, or III) or that the activity proceed without further cultural resource data being necessary in accordance with 36 CFR 800.11 (a)(b), and AFI 32.7065.

c. If training or exercise activities could impact cultural resources, it is recommended that the training or exercise activity be altered to avoid impact to cultural resources. This can be accomplished through early coordination with the BHPO and the NEPA process.

d. The submittal of an AF Form 813, *Request for Environmental Impact Analysis*, would be required to properly analyze potential environmental impacts to cultural resources.

4.6.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to cultural resources would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.6.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.7 Geology and Soils

4.7.1 Alternative A Impacts (Proposed Action)

The ERP sites and AOC often undergo long-term monitoring and remediation effort. These sites could be susceptible to damage from adjacent training and exercise activities. Numerous wells, which consist of little more than short aboveground pipes, may be positioned to sample groundwater, representing hours of work and precise locations. The environment of a remediation or monitoring site is sensitive to disturbance, as precise measurements may require controlled conditions. The data obtained is required to accomplish ERP goals and objectives. Coordination with Environmental Management to avoid impacts to ERP sites, AOCs, and remediation equipment, including wells and lines, would minimize potential impacts.

4.7.1.1 Topography

Topography is the greatest factor in increasing soil erosion. For the purpose of this discussion, topographic features that increase erosion may be defined as any slope greater than 1:1. The soils of such slopes are influenced by gravity and have a greater tendency to erode than those on flat land. In such cases, vegetation is often an important factor in keeping such soils stable.

Trenching and grading activities expose soils to wind erosion. Due to the high winds that are common to the west Mojave, exposed soils can contribute to wind erosion, PM10 emissions, and reduction in visibility due to particles in the air. Training and exercise activities may include the use of tanks, heavy equipment, unpaved roads, or off road. Helicopter activities may impact airborne particulate and dust emissions. If recommended minimization measures are implemented, no significant adverse impacts are anticipated.

4.7.1.2 Remediation Equipment Disturbance

There are ERP monitoring wells located throughout the base. Project activities such as vehicle and heavy equipment operation have the potential to damage monitoring wells and/or remediation systems. If recommended minimization measures are implemented, no significant adverse impacts are anticipated.

4.7.1.3 Direct/Indirect Effects

Training and exercise activities have the potential for a direct effect by damaging monitoring wells and remediation systems. Consultation with Environmental Management would be required prior to project activities in order to minimize the potential damage to ERP equipment. Some training and

exercise activities, such as, helicopter operations, and heavy equipment use have the potential to directly impact soil erosion. The construction of facilities or other training and exercise activities could require the use of fill material for building pads. The fill material would be hauled from existing borrow pits, which would have a minor direct effect on the local plant biology in the area. Activities at borrow sites may indirectly disturb desert tortoise or burrowing owl habitat. By using designated borrow pits and consulting with Environmental Management prior to soil excavation, environmental issues regarding potential biological encounters would be identified. If minimization measures are implemented, any direct or indirect effects on biological resources would be minimal.

4.7.2 Alternative A Minimization Measures (Proposed Action)

The following minimization measures are required or recommended for Alternative A.

a. All earthwork should be planned and conducted to minimize the duration that soils would be left unprotected. The extent of the area of disturbance necessary to accomplish the project should be minimized. Ground-disturbing activities should be delayed during high-wind conditions (in excess of 25 mph). Vehicular traffic, grading, and digging should not be permitted in the project area during high-wind conditions.

b. Exposed surfaces shall be periodically sprayed with water.

c. Project activities may be located in close proximity to ERP monitoring wells and remediation equipment. Prior to onset of any exercise or training activities, the proponent/contractor shall contact Environmental Management Restoration Branch for location of ERP equipment. Damage to ERP equipment must be avoided.

d. Prior to commencement of work activities at approved borrow sites, the proponent/contractor shall specifically establish approved locations, perimeters, and dimensions of the approved site. To establish these coordinates, the contractor shall consult with Environmental Management to identify specific environmental issues including, but not limited to, endangered, threatened, and sensitive species.

4.7.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to geology and soils would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.7.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.8 Socioeconomics

4.8.1 Alternative A Impacts (Proposed Alternative)

4.8.1.1 Fiscal Growth

The proposed project would provide a short-term positive, incremental impact to the economy of the Antelope Valley from increased revenue generation. This increase would vary

dependent upon the specifics of the training or exercise activities being accomplished. Some training could originate from out of the immediate geographic area, so training and exercise personnel may need to be housed off-base in the local community. This would be an increase in revenue to the area, but is not expected to occur during every training and exercise activity.

4.8.1.2 Direct/Indirect Effects

Training and exercises would have minimal positive direct effect to the economy of the Antelope Valley from increased revenue generation if training and exercise personnel are housed in the local community. No indirect effects are anticipated.

4.8.2 Alternative A Minimization Measures (Proposed Action)

No minimization measures are required for this alternative.

4.8.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to socioeconomics would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.8.4 Alternative B Minimization Measures

No minimization measures are required for this alternative.

4.9 Infrastructure

4.9.1 Alternative A Impacts (Proposed Action)

4.9.1.1 Transportation System

Under the proposed action traffic problems may be created by the nature of the exercise scenarios being enacted. Proposed project activities have the potential to impact the transportation system through traffic delays or temporary closure of roadways. Traffic delays are anticipated due to the nature of some exercise and training scenarios. Road closures or the rerouting of traffic would be temporary; lasting only as long as was necessary to ensure personnel safety while the required action was completed. Exercise and training-related traffic delays would be temporary and short-term. Early coordination with base organizations would ensure necessary safety precautions are taken and would allow ample advance notice to affected commuters and personnel. No significant operational-related impacts to the existing transportation system are anticipated.

4.9.2 Alternative A Minimization Measures (Proposed Action)

Submit traffic control plans with Security Police, Fire Protection Division, and Public Affairs Office.

4.9.3 Alternative B Impacts

Under this alternative, training and exercise activities would continue to occur and be analyzed on a case-by-case basis. Potential impacts to infrastructure would need to be analyzed on an individual basis with impacts similar to those of Alternative A.

4.9.4 Alternative B Minimization Measures

The minimization measures would be the same as those described for Alternative A.

4.10 NEPA Mandated Analysis

Training and exercise activities would affect certain aspects of the environment. These aspects have been evaluated together with five additional impacts that include:

- a. Direct/indirect effects
- b. Short-term use versus long-term productivity
- c. Cumulative effects
- d. Unavoidable adverse effects, and
- e. Irreversible and irretrievable commitments of resources

The evaluation of direct/indirect effects was presented earlier, in the discussion of the affected environment in Section 4.0, Environmental Consequences. A discussion of cumulative effects, unavoidable adverse effects, short-term use versus long-term productivity, and irreversible and irretrievable commitments of resources are discussed in the following sections.

4.10.1 Cumulative Impacts

The CEQ regulations implementing NEPA require agencies to consider the potential for cumulative impacts of the proposed actions. “Cumulative impact” is defined in 40 CFR 1508.7 as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.” Past projects, or those implemented or built before 2005 can be considered to be part of the existing environmental conditions baseline presented in this EA. Included within the concept of past projects are previous exercise and training actions, all maintenance activities, land development projects, and other actions that occurred before detailed analysis began on this EA. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Present projects occurring on the base include repavement and regrading of roads, demolition/replacement of older military family housing, demolition of surplus family housing units, construction of a new runway, and demolition/reconstruction of Runway 04/22. Additionally, training and exercise activities are currently taking place on base. The long-term cumulative impacts from these activities would be minimal since most of these activities are continuing operations or maintenance to existing structures that are already part of the existing baseline conditions and only a small percentage are new construction.

For the proposed action, training and exercise activities would continue to comply with base requirements. Compliance with the appropriate minimization measures would ensure that no significant adverse cumulative impacts would occur as a result of the proposed action. Impacts to physical resources (e.g., noise, air quality, erosion, safety and occupational health, hazardous materials and waste, socioeconomics, and infrastructure) related to training and exercise activities would not contribute substantially to cumulative impacts since they are typically localized and temporary actions. Impacts to natural resources, cultural resources, and geology and soils also would not contribute substantially to cumulative impacts since they would be localized and temporary actions. Compliance with the appropriate minimization measures would ensure that no adverse cumulative impacts would occur as a result of the proposed action. Long-term impacts to these resources from the implementation of the proposed action would be minimal, as discussed throughout Section 4.0, Environmental Consequences.

Implementation of the proposed action alternative would not provide significant incremental increase in revenue generated in the local economy, because training and exercise activities would occur when mandated, and therefore, would not be a continual source of cash flow and would not have a significant cumulative impact to the economy.

The implementation of Alternative B would result in no change to the existing conditions. Therefore, no significant impacts would result. Impacts would be similar but as activity specific as Alternative A.

4.10.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts include those that are negative and occurring regardless of any identified minimization measures.

a. Helicopter operations would generate air emissions, resulting in a short-term unavoidable adverse impact to air quality. The implementation of proposed minimization measures will ensure that air emissions are *de minimis*.

b. Potential exposure to hazardous noise levels, hazardous materials, and hazardous environmental conditions, including exposure to weapons and munitions during some training scenarios, is an unavoidable adverse impact and short-term, but are routinely mitigated by following the proposed minimization measures.

c. An unavoidable short-term adverse impact could occur from disruptions in vehicular traffic due to training and exercise scenarios.

Unavoidable adverse impacts associated with Alternative B are anticipated to be similar to those listed for Alternative A.

4.10.3 Short-Term Use versus Long-Term Productivity

This section discusses the proposed project's short-term use of man's environment and the maintenance and enhancement of long-term productivity. Short-term uses, and their effects, are those activities that would occur during training and exercise activities. Long-term productivity looks at economic, social, and planning objectives, and sustainability.

a. Effects of short-term use that would occur during training and exercise activities include:

(1) Exposure to noise hazards, hazardous materials (including propellants and munitions), and hazardous environmental conditions (ACM/LBP)

(2) Hazardous material use and generation of hazardous waste, including munitions and explosives

(3) Possible disturbances to biological resources and their habitat

(4) Potential to damage monitoring wells, lines, and/or remediation systems

(5) Disruptions in vehicular traffic

(6) Wind erosion from helicopter operations and/or heavy equipment use.

b. This project would have the following effects on long-term productivity.

(1) Increased knowledge regarding the prehistory and history of the area from cultural resource evaluations

(2) Personnel would be more knowledgeable and better prepared in proper safety and occupational health procedures

(3) Personnel would be better prepared for deployment

(4) The Air Force would have an available facility to engage in training and exercise activities, which would be an attraction to off-base entities.

4.10.4 Irreversible and Irretrievable Commitment of Resources

Irreversible commitment of resources entails the consumption of or adverse effect upon resources that cannot be reversed or persists for an extremely long period of time. Irretrievable commitment of resources are those that are consumed or affected for a short period of time and that would be restored over time. Irreversible and irretrievable commitment of resources would result from the implementation of the proposed action. Training and exercise activities would require the commitment of labor, capital, energy, and land resources. Short-term commitments include labor, capital, and fossil fuels that result directly from training and exercise activities. No long-term commitments are anticipated.

Under Alternative B, there would be a similar commitment of such resources.

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7.0 LIST OF AGENCIES AND ORGANIZATIONS TO WHOM COPIES OF THE ENVIRONMENTAL ASSESSMENT ARE SENT

Federal Agencies

AFFTC Technical Library, Building 1400, Edwards AFB, California

Edwards Base Library, 95th Mission Support Group (95 MSG/SVRL), Edwards AFB, California

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FINAL



APPENDICES



February 2007

APPENDIX A
AIR EMISSION CONFORMITY LETTER
AND PRELIMINARY AIR EMISSION CALCULATIONS

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**DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 95TH AIR BASE WING (AFMC)
EDWARDS AIR FORCE BASE CALIFORNIA**

MEMORANDUM FOR AFFTC/IG

FROM: 95 ABW/CEVC

SUBJECT: Clean Air Act Conformity Statement for Control No. 06-0729, *Routine Basewide Military-Sponsored Training Exercises, Edwards Air Force Base, California*

1. The following finding is made on the need for a conformity statement under the Clean Air Act with respect to the Proposed Action.

a.. The Proposed Action is located in the following air quality management districts: Kern County Air Pollution Control District (KCAPCD), Mojave Desert Air Quality Management District (MDAQMD), and Antelope Valley Air Quality Management District (AVAQMD).

b. Under regulations promulgated pursuant to the Clean Air Act, Title 42 United States Code (U.S.C.) Part 7506(c), Edwards Air Force Base is located in a *Serious* nonattainment area for ozone. The *de minimis* level set for this area for emissions of ozone precursor pollutants (volatile organic compounds [VOCs] or oxides of nitrogen [NO_x]), in accordance with Title 40 Code of Federal Regulation (CFR) Part 51.853/93.153(b)(1) and KCAPCD Rule 210.7, is up to 50 tons per pollutant (VOCs or NO_x) per year per action.

c. Under regulations promulgated pursuant to the Clean Air Act, 42 U.S.C. 7506(c), the Proposed Action portion of the project area regulated by the MDAQMD and AVAQMD is located in a nonattainment area for ozone. These areas are rated as *Severe* 17 under the federal Clean Air Act. As such, the *de minimis* level set for ozone emissions, in accordance with 40 CFR 51.853/93.153(b)(1), MDAQMD Rule 2002, and AVAQMD Regulation XIII, is up to 25 tons per ozone precursor pollutant (VOC or NO_x) per year per action.

d. Under the federal Clean Air Act, the Proposed Action portion of the project area regulated by the MDAQMD is located in a *Moderate* nonattainment area for particulate matter less than or equal to 10 microns (PM₁₀). As such, the *de minimis* level set for PM₁₀ emissions is up to 100 tons per year per action.

e. It has been determined that portions of this action may qualify for exemptions under 40 CFR 51.853/93.153(c)(2)(xiii) and (d)(3). The exemptions are as follows:

1) Routine operation of facilities, mobile assets and equipment.

2) Research, investigations, studies, demonstrations, or training (other than those exempted under paragraph (c)(2) of this section), where no environmental detriment is incurred

and/or, the particular action furthers air quality research, as determined by the state agency primarily responsible for the applicable State Implementation Plan.

f. Individual training and/or exercise activities would be reviewed and an air conformity analyses would be conducted on a project specific basis by 95 ABW/CEVC.

2. Should you have any questions with respect to this finding, please direct them to James Specht at (661) 277-1439.

A handwritten signature in black ink, appearing to read "Robert M. Shirley", with a long horizontal flourish extending to the right.

ROBERT M. SHIRLEY, Chief
Environmental Quality Branch

Table A-1. Data Input and Results

						Days Absent					
		Filled From Existing People		New Employees		Vacation		Sick		TDY/Travel	
Manpower Positions	Total	%	Number	%	Number	Days/Yr	%	Days/Yr	%	Days/Yr	%
Military	250	99%	248	1%	3	20	8%	5	2%	20	8%
Civilian	10,000	99%	9,900	1%	100	2	1%	2	1%	1	0%

Aircraft	Exercise Sorties	Annual T&G	Total
F-16	500	500	1,000
F-15	200	200	400
T-38 (A-10)	40	40	80
B-1	20	20	40
B-52G/H	10	10	20
C-130	50	50	100

Car Pool Factor: Persons/car	1.2
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Annual sorties must come from proponent based on number of aircraft and estimated operational usage.

Assumption of 1 landing/takeoff cycle (LTO) and 1 touch and go (TGO) per sortie. The TGO estimate is based on several years of AFTO 781 data taken from Edwards AFB flight records database

Government Vehicles	Number	Miles/Day/Vehicles	Total Miles/Yr
Pickup	15	50	195,000
Van	15	50	195,000
Auto	15	50	195,000
Total Government Miles/Yr			585,000

Increased government count to account for heightened activity bgs

Tactical Support Equipment (TSE)	<i>See Total Kern County Ground Emissions Page</i>
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TOTAL KERN COUNTY EMISSIONS FROM LISTED DATA INPUTS		
Emissions Source	NO _x tons per year (tpy)	VOC (tpy)
All Ground Sources	21.7	24.1
All Aircraft Flight Operations	10.1	5.1
Total Program Emissions	31.8	29.2

90%+ comes from privately owned vehicles (POVs) **79.15**

Table A-1 Critical Assumptions

Exercise days per event: 5

POV Calculations (See POV Miles and Military Personnel Distribution Tables for details):

1. Distribution of MFH (family housing) vs dorm residents (based on proponent information)
2. Distribution of on-base vs off-base family residents (based on FM pay addresses)
3. Distribution of residency by county (based on FM pay addresses)
4. Calculation of personal miles driven by on-base residents (estimate).
5. Emissions only calculated for miles driven (no engine starts or emissions while parked).

TSE Calculations: Emissions included in "All Ground Sources" (See Kern County Ground Emissions Calculations for details)

1. Exercise hours of use per unit of powered aerospace ground equipment

Flight Calculations

1. Only flight operations used in calculations are for Edwards AFB main runway operations

Table A-2. Vehicle and Aerospace Ground Equipment (AGE) Emissions Kern County Air Pollution Control District Only

Vehicle or Equipment Type	No. of Units	Hours or Gallons per Unit	Emission Factor		Power (hp)	Fuel Flow (gal/hr)	Annual Miles, Hrs or Gal	Unit of Calculation	Total Emissions per Year (tons)	
			NO _x	VOC					NO _x	VOC
LDGV (POV)	n/a	n/a	0.007	0.01145	n/a	n/a	4,121,570	Mile	14.43	23.60
LDGV (GOV)	n/a	n/a	0.007	0.01145	n/a	n/a	7,500	Mile	0.03	0.04
LDGT (GOV)	n/a	n/a	0.01	0.04	n/a	n/a	7,500	Mile	0.04	0.15
LDDT (GOV)	n/a	n/a	0.02	0.01	n/a	n/a	7,500	Mile	0.08	0.04
							Subtotal, Vehicles		14.56	23.83
Hydraulic Test Stand Diesel (A/M27T-13)	5	100	0.031	0.00247	98	n/a	500	Hp-Hour	0.76	0.06
Hydraulic Test Stand Diesel (MJ2A-1)	2	100	0.031	0.00247	200	n/a	200	Hp-Hour	0.62	0.05
Air Conditioner Diesel (MA-3D)	10	100	0.031	0.00247	110	n/a	1,000	Hp-Hour	1.71	0.14
Generator Set Diesel (A/M32A-86D)	10	100	0.031	0.00247	148	n/a	1,000	Hp-Hour	2.29	0.18
Air Start Cart JP-8 (M32A-95)	10	2,000	0.698	0.017	n/a	50	20,000	1,000 Gal Fuel	0.35	0.01
Light Cart Diesel	10	100	0.031	0.00247	8	n/a	1,000	Hp-Hour	0.12	0.01
Tow Tractor Diesel	10	100	0.031	0.00247	80	n/a	1,000	Hp-Hour	1.24	0.10
								Subtotal, AGE	7.09	0.55
								Total Emissions (Tons/Yr)	21.66	24.38

- Notes: 1. hp–horsepower
2. NO_x–nitrogen oxide
3. VOC–volatile organic compound
4. LDGV–light duty gasoline vehicle
5. POV–privately owned vehicle
6. n/a–not applicable
7. GOV–government
8. LDGT–light duty gasoline truck
9. LDDT–light duty diesel truck

Table A-3. Aircraft Summary

Aircraft	NO _x (tons)	VOC (tons)
F-16	4.7	0.8
F-15	3.7	0.6
T-38 (A-10)	0.0	0.3
B-1	0.8	0.4
B-52G/H	0.5	2.4
C-130	0.4	0.6
Total Program Emissions	10.1	5.1

Table A-4. Military Population

Exercise Population Analysis			Current Assigned Military Residents		
	Percent	No.	Source: Pay address zip codes from AFFTC/FMFC		
Exercise Population		1,000		No.	Percent
New People	10	100	Total Military	3,630	
Less Daily Absence Factor			On Base	2,200	61
Vacation	8	8	Off Base	1,430	39
Sick	2	2			
Deployed	8	8			
Daily Military Workforce		82			

Adjust total daily work force for living location.

NOTE: Cell colors correspond to linked data cells on POV Miles Page.

Living Location Calculation					
Housing Type	Percent	Number		Percent	Number
Family	67	54.9	On Base	61	33.3
			Off Base	39	21.6
Dormitory	33	27.1			

Must be provided by proponent based on estimate of age and makeup of military workforce.

Linked to POV Miles page.

Table A-5. Privately Operated Vehicle (POV) Miles

Kern County Air Pollution Control District						
Category		Number	Occupancy per Vehicle	No. of Trips per Day	Miles per Trip	Miles per Day
Civilian	County Residents	10,184.4	1.2	8,487.0	50	424,350
	Drive-through	11,955.6	1.2	9,963.0	40	398,520
Military (Off Base)	County Residents	10.0	1.2	8.3	50	415
	Drive-through	11.7	1.2	9.7	40	390
Military (On Base)	Family Housing (Commuting)	33.3	1.2	27.7	10	277
	Family Housing (Personal)	33.3	N/A	33.3	6	200
	Dormitory	27.1	1.0	27.1	6	162
Total Miles per Day						824,314
Total POV Miles per Event						4,121,570

Notes: 1. N/A – not applicable
2. 5 Exercise Days per Event
3. One personal trip per day for on-base households

Los Angeles County					
People	Number	Occupancy per vehicle	No. of Trips	Miles per Trip	Miles per Day
Military	9.7	1.1	8.9	40	354
Civilian	9,963.0	1.1	9,057.3	40	362,291
Total Miles per Day					362,645
Total POV Miles per Year					725,290

County Residence Distribution				
People	Total	Kern 46%	Los Angeles 45%	San Bernadino 9%
Military (Off Base)	21.6	10.0	9.7	1.9
Civilian	22,140.0	10,184.4	9,963.0	1,992.6

Note: Residence based on AFFTC/FM mailing address records for pay.

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