Environmental Assessment

General Plan-Based Environmental Impact Analysis Process
Laughlin Air Force Base

United States Air Force
Air Education and Training Command
Randolph Air Force Base, Texas

May 2007

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
MAY 2007		**00-00-2007 to 00-00-2007**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Environmental Assessment: General Plan-Based Environmental Impact Analysis Process Laughlin Air Force Base	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Weston Solutions Inc,70 N.E. Loop 410 Ste 600,San Antonio,TX,78216**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The Air Force proposes to relocate the Introduction to Fighter Fundamentals (IFF) and Student Undergraduate Pilot Training (SUPT) missions from Moody AFB, Georgia to Laughlin AFB, as well as implement Laughlin AFB?s Capital Improvements Program (CIP). The purpose of the proposed and alternative actions is to relocate the IFF and SUPT missions in accordance with BRAC legislation and construct and/or modify facilities and infrastructure at Laughlin AFB (1) in direct support of BRAC requirements, (2) as a part of the overall CIP, or (3) as needed to support future mission growth and development on the installation. The projects resulting from the CIP and BRAC requirements are needed to improve the effectiveness of training; enhance quality of life; replace or renovate old inadequate facilities; correct current deficiencies; and accommodate new mission activities, personnel, equipment and aircraft. The Proposed Action would relocate 15 T-38C Talon aircraft to establish a new IFF mission at Laughlin AFB and add 14 T-6A Texan II aircraft to support the primary phase of the SUPT mission. The Proposed Action would also result in the addition of 178 full-time military and civilian personnel, as well as the implementation of CIP projects identified in the 2006 General Plan ? Laughlin AFB, other facility additions, alterations, and construction in support of the increase SUPT and new IFF missions. Under Alternative 1, the Air Force would still accommodate BRAC and CIP requirements in the Proposed Action but this alternative would also provide for additional installation development beyond those projects specifically identified in the Proposed Action. This would include the development of approximately 889 acres of land at Laughlin AFB. This development would result in an increase of approximately 131 acres of impervious cover, which would add approximately one million square feet of additional facility space to the installation. Alternative 1 would also result in an additional 410 full-time personnel at Laughlin AFB. Under the No Action Alternative, the Air Force would not construct or alter any facilities or infrastructure at Laughlin AFB. The following resources were identified for study in this EA: Airspace Use and Management Noise, Land Use, Air Quality, Earth Resources, Biological Resources, Cultural Resources, Water Resources, Hazardous Substances, Safety, Utilities and Infrastructure, Socioeconomic Resources, and Environmental Justice and Environmental Health and Safety of Children.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**216**	

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT
GENERAL PLAN-BASED ENVIROMENTAL IMPACT ANALYSIS PROCESS

LAUGHLIN AIR FORCE BASE, TEXAS

AGENCY: 47th Flying Training Wing (FTW), Laughlin Air Force Base (AFB), Texas.

BACKGROUND: The 47th FTW at Laughlin AFB has prepared an environmental assessment (EA) based on the Laughlin AFB General Plan and Base Realignment and Closure (BRAC) mission requirements. This EA has been accomplished pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations implementing the NEPA, Department of Defense (DoD) Directive 6050.1, Environmental Effects in the United States of DoD Actions, Air Force Instruction (AFI) 32-7061, The Environmental Impact Analysis Process, and 32 Code of Federal Regulations (CFR) Part 989 Environmental Impact Analysis Process.

PROPOSED ACTION: The Air Force proposes to relocate the Introduction to Fighter Fundamentals (IFF) and Student Undergraduate Pilot Training (SUPT) missions in accordance with BRAC legislation and implement Laughlin AFB's Capital Improvements Program (CIP). The Proposed Action will result in the relocation of 15 T-38C Talon aircraft and 14 T-6A Texan aircraft to Laughlin AFB, as well as the implementation of the CIP and other facility additions, alterations, and construction in support of the increase SUPT and new IFF missions. Additionally, 178 full-time military and civilian personnel and approximately 258 dependents will be relocated to Laughlin AFB.

ALTERNATIVE 1 – POTENTIAL DEVELOPMENT ALTERNATIVE: The Air Force proposes to accommodate BRAC and CIP requirements as in the Proposed Action but also provide for additional installation development beyond those projects specifically identified in the Proposed Action. Alternative 1 will result in the relocation of 15 T-38C Talon aircraft and 14 T-6A Texan aircraft to Laughlin AFB, as well as the development of approximately 889 acres of land resulting in approximately one million square feet of additional facility space and 131 acres of additional impervious cover on the installation. Additionally, 410 full-time personnel and approximately 223 dependents will be relocated to Laughlin AFB.

NO ACTION ALTERNATIVE: Under the No Action Alternative, the Air Force will not construct or alter any facilities or infrastructure at Laughlin AFB. The installation will not acquire aircraft or personnel associated with the new mission.

SUMMARY OF FINDINGS FOR PROPOSED ACTION:

Airspace Use and Management. Aircraft operations will increase by approximately 21 percent. This level of activity will not be sufficient to make the airspace surrounding Laughlin AFB or Del Rio International Airport a candidate for Class B airspace. Laughlin AFB Special Use Airspace utilization will increase but will not be expected to restrict movement of other air traffic in the area.

Noise. The amount of land exposed to Day-Night Average Sound Levels (DNL) above 65 A-weighted decibels (dB[A]) will increase by approximately 14 percent. Noise exposure to sensitive receptors will increase by less than one dB(A) DNL which would be barely perceptible. Demolition and construction activities in the vicinity of the each project location will result in minor, short-term increases in noise levels. Short-term noise created by the Proposed Action will not significantly impact sensitive receptors on, or adjacent to Laughlin AFB.

Land Use. No impacts are expected. The activities in the Proposed Action will be compatible with existing land uses and in accordance with land use plans for the installation and surrounding areas.

Air Quality. There will be a short-term increase in air emissions associated with the construction, renovation, and demolition activities. There will be a long-term increase in air emissions due to increased aircraft operations and vehicles. The increase in emissions would not be considered regionally significant and would not be expected to cause the region to exceed air quality standards. The Proposed Action will occur in an area that is currently classified as "attainment" for National Ambient Air Quality Standards, will not be subject to a conformity analysis, and will not expose the public or operational personnel to hazardous levels of air emissions.

Earth Resources. There will be short-term, minor soil disturbance as a result of the proposed construction, renovation, and demolition activities. The soils in the vicinity of the proposed construction projects at Laughlin AFB have been previously disturbed and the projects are located in improved areas with existing facilities and paved roads.

Biological Resources. No adverse impacts to biological resources are expected. The proposed construction and renovation projects will occur within the cantonment area of Laughlin AFB, a previously disturbed area characterized by landscaped areas among buildings, roads and parking areas. No known or suspected federally threatened or endangered species are thought to inhabit the project areas.

Cultural Resources. No impacts to historic or archeological resources are expected. The buildings and structures proposed for demolition or alteration are not eligible for listing in the National Register of Historic Places and the project sites are not near known archaeological resources.

Water Resources. There will be a seven percent increase in impervious cover on the installation resulting in increased runoff volumes. There will be a potential for insignificant short-term impacts to surface water quality during the initial demolition and construction activities. There will be no impacts to the quality or quantity of groundwater at Laughlin AFB or the surrounding area. There will be no impacts to floodplains.

Hazardous Substances. Hazardous materials and wastes will be managed in accordance with existing Laughlin AFB, state, and federal plans and regulations. Project activities will occur within one-half mile of known Environmental Restoration Program sites or Areas of Concern, but it is unlikely that construction or demolition activities will encounter contaminated groundwater.

Safety. Aircraft mishap potential and bird/wildlife-aircraft strike hazard potential will not change significantly from baseline conditions. There could be short-term, minor adverse effects to safety due to the temporary increase in construction activities.

Utilities and Infrastructure. There will be minor, long-term increase in potable water consumption and a minor, long-term increase in wastewater generation. There will also be a minor, short-term increase in solid waste; minor, long-term impacts to drainage systems due to additional impervious surface; minor long-term increase in traffic counts on the installation and in the local area; and minor, long-term increases in overall electrical and natural gas consumption. No significant impacts to infrastructure and utilities are expected.

Socioeconomic Resources. There will be a minor, long-term increase to the population in the local community; no impacts to housing for military personnel and families; minor long-term impact on housing for the general community due to a decrease in off-base housing units available to the general public; long-term increase in area school populations due to the enrollment of an additional 80 children in the San Felipe Del Rio Consolidated Independent School District, and positive, short- and long-term impacts to the local economy.

Environmental Justice and Environmental Health and Safety of Children. Activities associates with the proposed action will not impose adverse environmental effects on adjacent populations. Therefore, no disproportionately high and adverse effects will occur to children, minority populations, or low-income populations.

SUMMARY OF FINDINGS FOR ALTERNATIVE 1 – POTENTIAL DEVELOPMENT ALTERNATIVE: The impacts associated with Alternative 1 are similar to those discussed under the Proposed Action. Flying operations will be the same under Alternative 1 but the installation population and amount of installation development will be greater under this alternative. As a result, short-term impacts associated with construction activities will be greater under Alternative 1. In addition, long-term impacts associated with increased population will be slightly greater under this alternative but still insignificant.

SUMMARY OF FINDINGS FOR NO ACTION ALTERNATIVE: The conditions and characteristics anticipated under the No Action Alternative for each resource area will continue at levels equal to those occurring under the existing condition. No significant environmental impacts are experienced or generated by the existing condition. Therefore, no significant impacts will be expected for the No Action Alternative.

SUMMARY OF CUMULATIVE EFFECTS: The cumulative impact of implementing this action along with other past, present, and future projects in the Region of Influence were assessed in the attached EA and no significant cumulative impacts were identified.

SUMMARY OF PUBLIC COMMENTS:

The Environmental Assessment and draft Finding of No Significant Impact were available to the public for 30 days at the Val Verde Public Library and Laughlin AFB Library. Copies were also sent to a list of interested persons. There was one unique comment, received from the Texas Historical Commission, which concurred with the findings of the EA. No revisions to the text of the EA were required.

DECISION: Based upon my review of the Environmental Assessment attached and incorporated by reference, and contingent upon implementation of specific mitigation measures to be implemented by the 47th Flying Training Wing, I conclude that none of the alternatives, nor the Proposed Action will have a significant direct, indirect, or cumulative impact upon the environment. Accordingly, the requirements of the National Environmental Policy Act, regulations promulgated by the President's Council on Environmental Quality, and 32 CFR Part 989 are fulfilled and an Environmental Impact Statement is not required at this time.

Laro Clark

DAN LARO CLARK, Colonel, USAF
Vice Commander, 47th Flying Training Wing

23 MAY 07

Date

Environmental Assessment

General Plan-Based Installation Development

Prepared For:

Department of the Air Force
47th Flying Training Wing
Laughlin Air Force Base, Texas

Cover Sheet

COVER SHEET

Responsible Agency: 47th Flying Training Wing (FTW), Laughlin Air Force Base (AFB), Texas

Proposed Action: Mission Beddown and Installation Development at Laughlin AFB, Texas, Val Verde County.

Points of Contact: Laughlin AFB Environmental: Ramon Flores, 47 CES/CEV, 251 Fourth Street, Laughlin AFB, Texas 78843, (830) 298-5694; Air Education and Training Command: Patricia Salas, HQ AETC/A7CVI, 266 F Street West, Randolph AFB TX 78150-4319, (210) 652-1962. Comments on the Draft EA were requested by May 17, 2007.

Report Designation: Environmental Assessment (EA)

Abstract: The Air Force proposes to relocate the Introduction to Fighter Fundamentals (IFF) and Student Undergraduate Pilot Training (SUPT) missions from Moody AFB, Georgia to Laughlin AFB, as well as implement Laughlin AFB's Capital Improvements Program (CIP). The purpose of the proposed and alternative actions is to relocate the IFF and SUPT missions in accordance with BRAC legislation and construct and/or modify facilities and infrastructure at Laughlin AFB (1) in direct support of BRAC requirements, (2) as a part of the overall CIP, or (3) as needed to support future mission growth and development on the installation. The projects resulting from the CIP and BRAC requirements are needed to improve the effectiveness of training; enhance quality of life; replace or renovate old inadequate facilities; correct current deficiencies; and accommodate new mission activities, personnel, equipment and aircraft.

The Proposed Action would relocate 15 T-38C Talon aircraft to establish a new IFF mission at Laughlin AFB and add 14 T-6A Texan II aircraft to support the primary phase of the SUPT mission. The Proposed Action would also result in the addition of 178 full-time military and civilian personnel, as well as the implementation of CIP projects identified in the 2006 *General Plan – Laughlin AFB*, other facility additions, alterations, and construction in support of the increase SUPT and new IFF missions. Under Alternative 1, the Air Force would still accommodate BRAC and CIP requirements in the Proposed Action but this alternative would also provide for additional installation development beyond those projects specifically identified in the Proposed Action. This would include the development of approximately 889 acres of land at Laughlin AFB. This development would result in an increase of approximately 131 acres of impervious cover, which would add approximately one million square feet of additional facility space to the installation. Alternative 1 would also result in an additional 410 full-time personnel at Laughlin AFB. Under the No Action Alternative, the Air Force would not construct or alter any facilities or infrastructure at Laughlin AFB.

The following resources were identified for study in this EA: Airspace Use and Management, Noise, Land Use, Air Quality, Earth Resources, Biological Resources, Cultural Resources, Water Resources, Hazardous Substances, Safety, Utilities and Infrastructure, Socioeconomic Resources, and Environmental Justice and Environmental Health and Safety of Children.

PRIVACY ADVISORY NOTICE

Public comments on the Draft EA were requested pursuant the National Environmental Policy Act, 42 United States Code 4321, et seq. All written comments received during the comment period were considered during Final EA preparation and are provided in this document. Address information received during the comment period was used to compile the project mailing list; however, such personal information will be kept confidential unless release is required by law.

Table of Contents

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (CONTINUED)

APPENDICES

(no document text this page)

Acronyms and Abbreviations

ACRONYMS AND ABBREVIATIONS

ACAM	Air Conformity Applicability Model
ACM	asbestos-containing material
AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AICUZ	Air Installation and Compatible Use Zone
AIRFA	American Indian Religious Freedom Act
ANG	Air National Guard
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
AOC	Area of Concern
ARPA	Archaeological Resources Protection Act
ATC	Air Traffic Control
AT/FP	antiterrorism/force protection
AVGAS	aviation gasoline
BAM	Bird Avoidance Model
BASH	Bird/Wildlife-Aircraft Strike Hazard
BFZ	Balcones Fault Zone
bgs	below ground surface
BMPs	Best Management Practices
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CAAA	Clean Air Act Amendment
C&D	Construction and Demolition
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	Capital Improvements Program
CISD	Consolidated Independent School District
CO	carbon monoxide
COC	Community of Comparison
CWA	Clean Water Act
dB	decibel
dB(A)	"A-weighted" decibel
DDT	dichlorodiphenyltrichloroethane
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EAC	Early Action Compact

ACRONYMS AND ABBREVIATIONS (CONTINUED)

EIAP	Environmental Impact Analysis Process
EO	Executive Order
ERP	Environmental Restoration Program
ESZ	explosive safety zones
FAA	Federal Aviation Administration
FICON	Federal Interagency Committee on Noise
FS	Feasibility Study
FTW	Flying Training Wing
FY	fiscal year
gpm	gallons per minute
HRMA	Housing Requirements and Market Analysis
HUD	United States Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
Hwy	Highway
ID	identification
IICEP	Intergovernmental and Interagency Coordination for Environmental Planning
IFF	Introduction to Fighter Fundamentals
IFR	instrument flight rules
INRMP	Integrated Natural Resources Management Plan
JP	jet propellant
kcf	thousand cubic feet
LBP	lead based paint
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
LTM	Long Term Monitoring
MACA	Mid-Air Collision Avoidance
MARS	Military Affiliate Radio System
MFH	Military Family Housing
MOA	Military Operations Area
MOGAS	motor gasoline
MSA	Metropolitan Statistical Area
MSDS	Material Safety Data Sheet
msl	mean sea level
MWh	megawatt-hours
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NALF	Naval Auxiliary Landing Field
NC	percent in core
NC-A/B	percent in core and after burner
NEI	National Emission Inventory
NEPA	National Environmental Policy Act
NF	percent at fan

ACRONYMS AND ABBREVIATIONS (CONTINUED)

NFRAP	No Further Response Action Planned
NHPA	National Historic Preservation Act
NLR	noise level reduction
NM	nautical miles
NO_x	nitrogen oxides
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
O_3	ozone
%	percent
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
PCE	perchloroethylene
PCS	Permanent Change of Station
PDA	Potential Development Alternative
PM_{10}	particulate matter equal to or less than 10 micrometers in aerodynamic diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 micrometers in aerodynamic diameter
POV	privately-owned vehicle
PPE	personal protective equipment
ppm	parts per million
QD	Quantity Distance
R-	Restricted
RA	Remedial Actions
RAPCON	Radar Approach Control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROI	Region of Influence
SEL	Sound Exposure Level
SF	square foot/feet
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SPL	sound pressure level
SUA	Special Use Airspace
SUPT	Specialized Undergraduate Pilot Training
SWPPP	Storm Water Pollution Prevention Plan
TCE	trichlorothylene
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
TSCA	Toxic Substance Control Act

ACRONYMS AND ABBREVIATIONS (CONTINUED)

$\mu g/m^3$	micrograms per cubic meter
US	United States
USACE	United States Army Corp of Engineers
USC	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VFR	visual flight rules
VOC	volatile organic compound

Chapter 1

Purpose of and Need for Action

CHAPTER 1
PURPOSE OF AND NEED FOR ACTION

This chapter has six parts: a statement of the purpose of and need for the action, a description of the location of the proposed and alternative actions, identification of the decision to be made, a description of the scope of the environmental review, identification of applicable regulatory requirements, and an introduction to the organization of the document.

1.1 PURPOSE OF AND NEED FOR ACTION

The 47th Flying Training Wing (FTW) at Laughlin Air Force Base (AFB) is planning future installation development based upon (1) the Capital Improvements Program (CIP) contained within the 2006 *General Plan – Laughlin AFB* (General Plan); and (2) Base Realignment and Closure (BRAC) mission recommendations which became law on 9 November 2005, in accordance with Public Law 101-510, as codified in 10 United States Code (USC) 2687, as amended. The BRAC recommendations included relocation of Introduction to Fighter Fundamentals (IFF) for Pilots and Weapons System Officers and portions of the primary phase of Specialized Undergraduate Pilot Training (SUPT) from Moody AFB, Georgia to Laughlin AFB, Texas. Currently, Laughlin AFB trains student pilots in the SUPT program; however, relocation of the Moody AFB program to Laughlin AFB would help to consolidate this mission. The addition of the IFF mission to Laughlin AFB would provide additional flight training to those pilots who have graduated from the SUPT program and have been assigned to fighter aircraft. The General Plan and BRAC requirements define facilities and associated site improvements required in support of existing and new missions. This Environmental Assessment (EA) will analyze impacts of those projects not already analyzed in the 2006 *Environmental Assessment for Multiple Projects, Laughlin AFB* (Multiple Projects EA) (USAF 2006a).

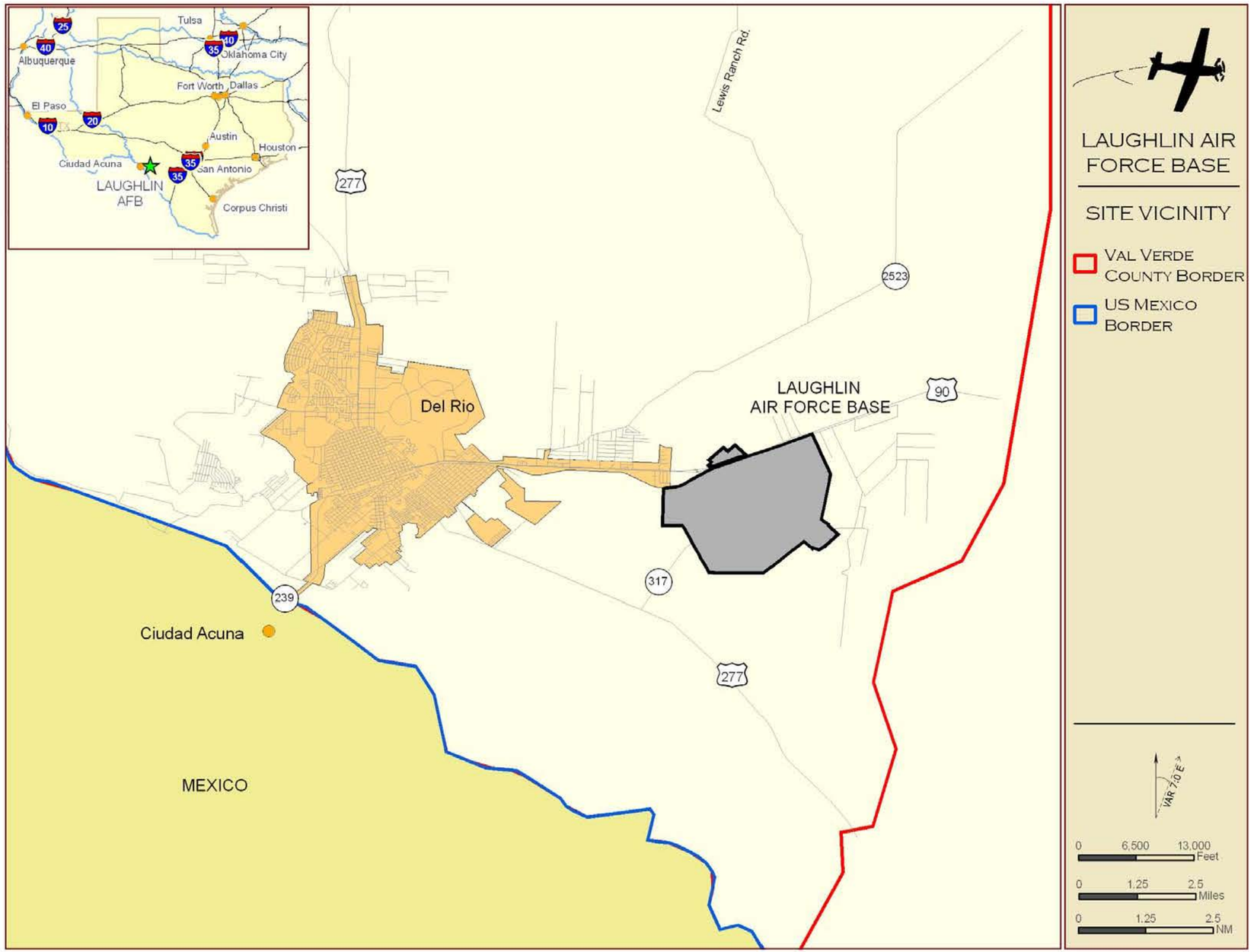
The purpose of the proposed and alternative actions is to relocate the IFF and SUPT missions in accordance with BRAC legislation and construct and/or modify facilities and infrastructure at Laughlin AFB (1) in direct support of BRAC requirements, (2) as a part of the overall CIP, or (3) as needed to support future mission growth and development on the installation. The projects resulting from the CIP and BRAC requirements are needed to improve the effectiveness of training; enhance quality of life; replace or renovate old inadequate facilities; correct current deficiencies; and accommodate new mission activities, personnel, equipment and aircraft. The proposed and alternative actions will represent a range of installation development scenarios so that a comparison may be made of the impacts from the status quo, implementation of BRAC and CIP requirements, and development of the installation to its sustainable capacity.

1.2 LOCATION OF THE PROPOSED ACTION

Laughlin AFB is located in Val Verde County, six miles east of Del Rio and six miles northeast of Ciudad Acuna, Mexico (Figure 1-1). The installation consists of 4,524 acres of land of which approximately 2,267 acres are considered developed.

(no document text this page)

Figure 1-1 Location and Area Map



(no document text this page)

1.3 DECISION TO BE MADE

The analysis in this EA evaluates the potential environmental consequences of actions associated with the relocation of IFF and a portion of SUPT as well as construction/modification of facilities and infrastructure at Laughlin AFB. These activities would fulfill BRAC requirements at Laughlin AFB and complete implementation of the installation's CIP. Based on this information, the Air Force will determine whether to implement the Proposed Action, Alternative 1, or take no action (No Action Alternative). As required by the National Environmental Policy Act (NEPA) and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project, and be available to inform decision-makers of the potential environmental impacts of selecting the Proposed Action, Alternative 1, or No Action Alternative.

1.4 SCOPE OF THE ENVIRONMENTAL REVIEW

NEPA of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental impact analysis. The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (Title 40, Code of Federal Regulations, Sections 1500-1508 [40 CFR Parts 1500-1508]) and Air Force regulations (32 CFR 989 [*Environmental Impact Analysis Process*]). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action.

This EA identifies, describes, and evaluates the potential environmental impacts associated with the relocation of IFF and a portion of SUPT as well as construction/modification of facilities and infrastructure at Laughlin AFB, taking into consideration possible cumulative impacts from other actions. The potential environmental effects of taking no action are also described. As appropriate, the affected environment and environmental consequences of the action may be described in terms of a regional overview or a site-specific description. Fiscal year (FY) 2006 or the most current information is used as the baseline condition.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by the President on 11 February, 1994. In the EO, the President instructed each federal agency to make "achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Adverse is defined by the Federal Interagency Working Group on Environmental Justice as 'having a deleterious effect on human health or the environment that is significant, unacceptable, or above generally accepted norms.'" This EA will identify and address adverse effects to low-income and minority populations that would result if the Proposed Action or alternative actions are implemented.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, mandates the investigation of environmental effects on children. This EO acknowledges that children may suffer disproportionately from environmental health risks and safety risks. Therefore, each federal agency is required to make it a priority to identify and assess environmental health and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

The Air Force has announced other independent actions for Laughlin AFB concurrent with the proposed or alternative actions. The environmental impacts of these other actions, in most cases, have been analyzed in separate NEPA documents. In addition, other actions are planned for the surrounding community (see Section 2.6). Through Intergovernmental and Interagency Coordination for Environmental Planning (IICEP), requests have been made for information on these and other planned actions in the surrounding community. This EA addresses the environmental impacts of these other actions only in the context of potential cumulative impacts, if any. A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is 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 regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

1.4.1 Resource Areas Addressed in Detail

Resource areas that could be affected by the proposed or alternative actions have been included to allow for a comprehensive analysis of potential impacts. The following resource areas are discussed in detail in the EA:

- Airspace Use and Management
- Noise
- Land Use
- Air Quality
- Earth Resources
- Biological Resources
    - Vegetation
    - Wildlife
    - Wetlands
    - Threatened and Endangered Species
- Cultural Resources
- Water Resources
    - Surface Water
    - Groundwater
    - Floodplains
- Hazardous Substances (including Environmental Restoration Program [ERP] sites)
- Safety
- Utilities and Infrastructure

  - Sanitary Sewer
  - Potable Water
  - Solid Waste
  - Drainage
  - Transportation
  - Electricity and Natural Gas
- Socioeconomic Resources
  - Population
  - Housing
  - Education
  - Economy
- Environmental Justice and Environmental Health and Safety of Children

1.5 APPLICABLE REGULATORY REQUIREMENTS

This EA is part of the EIAP for the proposed project as set forth in 32 CFR 989, 15 July 1999, as amended; CEQ regulations; Department of Defense (DoD) Directive 6050.1 (*Environmental Effect in the United States of DoD Actions,* July 30, 1979); as well as DoD Directive 4715.9 (*Environmental Planning and Analysis*).

NEPA requires federal agencies to consider, as part of the decision-making process, the environmental consequences of their proposed and alternative actions. The Air Force considers the potential environmental impacts identified during the EIAP in its decision. The following paragraphs describe the laws and regulations that apply or may apply to the proposed and alternative actions.

1.5.1 Interagency and Intergovernmental Coordination and Public Participation

Federal, state, and local agencies with jurisdiction that could be affected by the proposed or alternative actions have been notified and consulted. A complete listing of the agencies consulted may be found in Chapter 6. The IICEP scoping letters and associated responses, as well as the Draft EA Coordination letters and responses are presented in Appendix A. This coordination fulfills the *Intergovernmental Cooperation Act of 1968* (42 USC 4231(a) and *Intergovernmental Review of Federal Programs* (EO 12372), which require federal agencies to cooperate with and consider federal, state, and local views in implementing a proposal. EO 12372 is implemented by the Air Force in accordance with Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*.

Additionally, this EA was presented for public review in April 2007 for a period of 30 calendar days after a notice of availability was published in the local newspaper. Comments received were reviewed and revisions incorporated, as applicable. All comments received and responses to those comments are included in Appendix A.

1.5.2 Permits

The construction contractor would be required to ensure that all permits are identified and obtained from Laughlin AFB, local, state, and federal agencies prior to implementation of the

Proposed Action or alternatives. Digging permits would be required prior to any construction activities. All underground utilities would be identified and located prior to earth moving activities. The contractor would also ensure that a storm water pollution prevention plan (SWPPP) is completed, approved, and implemented before initiating construction activities.

1.5.3 Other Regulatory Requirements

This EA considers all applicable laws and regulations, including but not limited to the following:

- *Clean Air Act of 1970* (CAA) (42 USC 7401 *et seq*., and any subsequent amendments)
- AFI 32-7040, *Air Quality Compliance*
- EO 11990, *Protection of Wetlands*
- *Federal Water Pollution Control Act Amendments of 1972*, commonly known as the *Clean Water Act* (CWA), (33 USC 1251 *et seq*., and any subsequent amendments)
- EO 11988, *Floodplain Management*
- *Endangered Species Act of 1973* (16 USC 1531-1542, and any subsequent amendments)
- *Pollution Prevention Act of 1990* (42 USC 13101 and 13102 *et seq*., and any subsequent amendments)
- *National Historic Preservation Act of 1966* (16 USC 470 *et seq*., and any subsequent amendments)
- *Archaeological Resources Protection Act of 1979* (16 USC 470aa-mm, and any subsequent amendments)
- *Native American Graves Protection and Repatriation Act of 1991* (25 USC 3001 *et seq.*, and any subsequent amendments)
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- EO13045, *Protection of Children from Environmental Health Risks and Safety Risks*

1.6 INTRODUCTION TO THE ORGANIZATION OF THE DOCUMENT

This EA is organized into seven chapters.

Chapter 1 Contains a statement of the purpose of and need for action, the location of the proposed and alternative actions, identification of the decision to be made, a summary of the scope of the environmental review, identification of applicable regulatory requirements, and a description of the organization of the document.

Chapter 2 Describes the history of the formulation of alternatives; identifies alternatives eliminated from further consideration; provides a detailed description of the Proposed Action, Alternative 1, and the No Action Alternative; summarizes other actions announced for Laughlin AFB and the surrounding community; provides a comparison matrix of environmental effects for all alternatives; identifies the preferred alternative; and describes mitigation measures.

Chapter 3 Contains a general description of the current conditions of the resources that potentially could be affected by the proposed or alternative actions.

Chapter 4 Provides an analysis of the environmental consequences of the proposed and alternative actions.

Chapter 5 Lists preparers of this document.

Chapter 6 Lists persons and agencies consulted in the preparation of this EA.

Chapter 7 Lists source documents relevant to the preparation of this EA.

(no document text this page)

Chapter 2

Description of the Proposed Action and Alternatives

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter has nine parts: a brief history of the formulation of alternatives, identification of alternatives eliminated from further consideration, a description of the Proposed Action, a description of Alternative 1, a description of the No Action Alternative, identification of other proposed actions planned for Laughlin AFB and the surrounding community, a summary of environmental impacts of all alternatives, identification of the preferred alternative, and a table of proposed mitigation measures.

2.1 HISTORY OF THE FORMULATION OF ALTERNATIVES

The goals of the 2006 General Plan for Laughlin AFB are to provide a framework for programming, design and construction, and effective resource management. The General Plan identifies specific CIP projects, some of which have been analyzed in the 2006 Multiple Project EA. The remaining projects will be analyzed in this EA.

In addition, BRAC 2005 recommendations included relocation of IFF and a portion of the primary phase of SUPT from Moody AFB, Georgia to Laughlin AFB, Texas. Since existing facilities at Laughlin AFB are at or near capacity, Laughlin AFB began considering ways to accommodate this mission increase. Development of the installation to include construction of new facilities and infrastructure or additions to existing facilities and infrastructure was identified in order to maintain support of the existing mission while accommodating an increase in aircraft and personnel associated with the new IFF and increased SUPT missions.

Laughlin AFB is also considering an alternate development scenario that defines the future development potential of the installation to the extent that the actions would not result in a significant impact to any resource area. This scenario was constructed using a capability analysis that evaluated the capacity of the installation to accommodate future growth and development in facilities and infrastructure, population, and flying operations.

2.2 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Other potential alternatives that were eliminated from further consideration include:

- Leasing space off base for training and support requirements was eliminated because there are no facilities in the local community to support any of these requirements.

- Using other installations for new and existing mission activities was eliminated because the BRAC 2005 recommendations assigned the new IFF mission to Laughlin AFB and increased the installation's Primary Flight Training mission.

2.3 DETAILED DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action would relocate the IFF and SUPT missions in accordance with BRAC legislation and implement Laughlin AFB's CIP. These actions would require changes to flying

operations, construction and/or renovation of facilities and infrastructure, and increases in personnel at Laughlin AFB.

2.3.1 Flying Operations

The Proposed Action would relocate 15 T-38C Talon aircraft to establish a new IFF mission at Laughlin AFB. IFF is a nine-week long, advanced flying training program for graduates of SUPT, who have been selected to fly fighter aircraft. IFF training includes both air-to-air and air-to-ground training in basic fighter maneuvers, air combat maneuvering, tactical formation flying, advanced aircraft handling, instrument training, conventional surface attack, tactical surface attack, and close air support. The Proposed Action would also result in the addition of 14 T-6A Texan II aircraft to support the primary phase of the SUPT mission at Laughlin AFB. There would be no changes to the secondary phase of the SUPT mission currently occurring at Laughlin AFB. This phase uses T-38C and T-1A aircraft. An overall increase in the average daily student load of 30 students is expected as a result of the Proposed Action. Tables 2-1 presents the increase in aircraft counts that would result from implementation of the Proposed Action.

Table 2-1 Proposed Action Aircraft Counts

Aircraft Type	FY 2006 Baseline	Additional Aircraft/ Percent Increase	Proposed Action End State
T-6A Texan II	65	14 / 22%	79
T-38C Talon	79	15 / 19%	94
T-1A Jayhawk	52	0 / 0 %	52
TOTAL	**196**	**29 / 15%**	**225**

Notes:
% = percent
FY = fiscal year

Table 2-2 presents the increase in flying operations that would result from the implementation of the Proposed Action. In discussing flying operations at an airfield, it is helpful to define the following terms:

- Sortie: A sortie is defined as a single military aircraft flight from initial takeoff through termination landing.
- Aircraft Operation: An aircraft operation is defined as one takeoff or departure, one approach or landing, or half of a closed pattern.
- Closed Pattern: A closed pattern consists of two operations, a takeoff or departure and an approach or landing.

As a result, one sortie will always consists of at least two aircraft operations, a takeoff or departure and an approach or landing, but will often have more than two operations depending upon the number of closed patterns flown.

Table 2-2 Proposed Action Aircraft Operations

Aircraft Type	FY 2006 Baseline			Proposed Action End State			Percent Increase in Average Daily Operations
	Annual Sorties	Average Annual Operations[a]	Average Daily Operations[b]	Annual Sorties	Average Annual Operations[a]	Average Daily Operations[b]	
T-6A Texan II	26,905.5	385,286.5	1,653.6	32,903.1	471,172.6	2,022.2	22%
T-38C Talon	10,787.4	93,850.0	387.8	13,034.6	113,401.2	468.6	21%
T-1A Jayhawk	12,000.2	25,200.3	103.3	12,000.2	25,200.3	103.3	0%
TOTAL[c]	**49,693.1**	**504,336.8**	**2,144.7**	**57,937.9**	**609,774.1**	**2,594.1**	**21%**

Notes:
FY = fiscal year
[a] Based upon historical flying operations at Laughlin AFB, the following aircraft operations per sortie factors were used: T-6A (14.32 operations per sortie); T-38C (8.7 operations per sortie), T-1A (2.1 operations per sortie).
[b] Average Daily Operations equals the Average Annual Operations divided by the flying days per year which are: 233 days per year (T-6A), 242 days per year (T-38C), and 244 days per year (T-1A).
[c] Transient aircraft sorties are not presented in this table as they represent less than 0.1 percent of total aircraft operations at Laughlin AFB.

Laughlin AFB SUPT and IFF flying missions would continue to use existing Laughlin AFB Special Use Airspace (SUA). Air-to-ground training for the IFF Mission would be executed at the McMullen Range Complex and Naval Auxiliary Landing Field (NALF) Orange Grove operated by Naval Air Station Corpus Christi until a more suitable location in the proximity of Laughlin AFB can be identified and evaluated. Potential Laughlin AFB IFF operations at the McMullen Range Complex and NALF Orange Grove are being evaluated as a part of a separate EA for that complex.

2.3.2 Construction and Renovation

The Air Force proposes to implement the CIP projects identified in the General Plan, as well as other facility additions, alterations, and construction in support of the increased SUPT and new IFF missions. Information on these projects is listed below in Table 2-3.

Figure 2-1 shows the location of the facilities proposed for demolition.

(no document text this page)

Table 2-3 Proposed Action Construction Projects

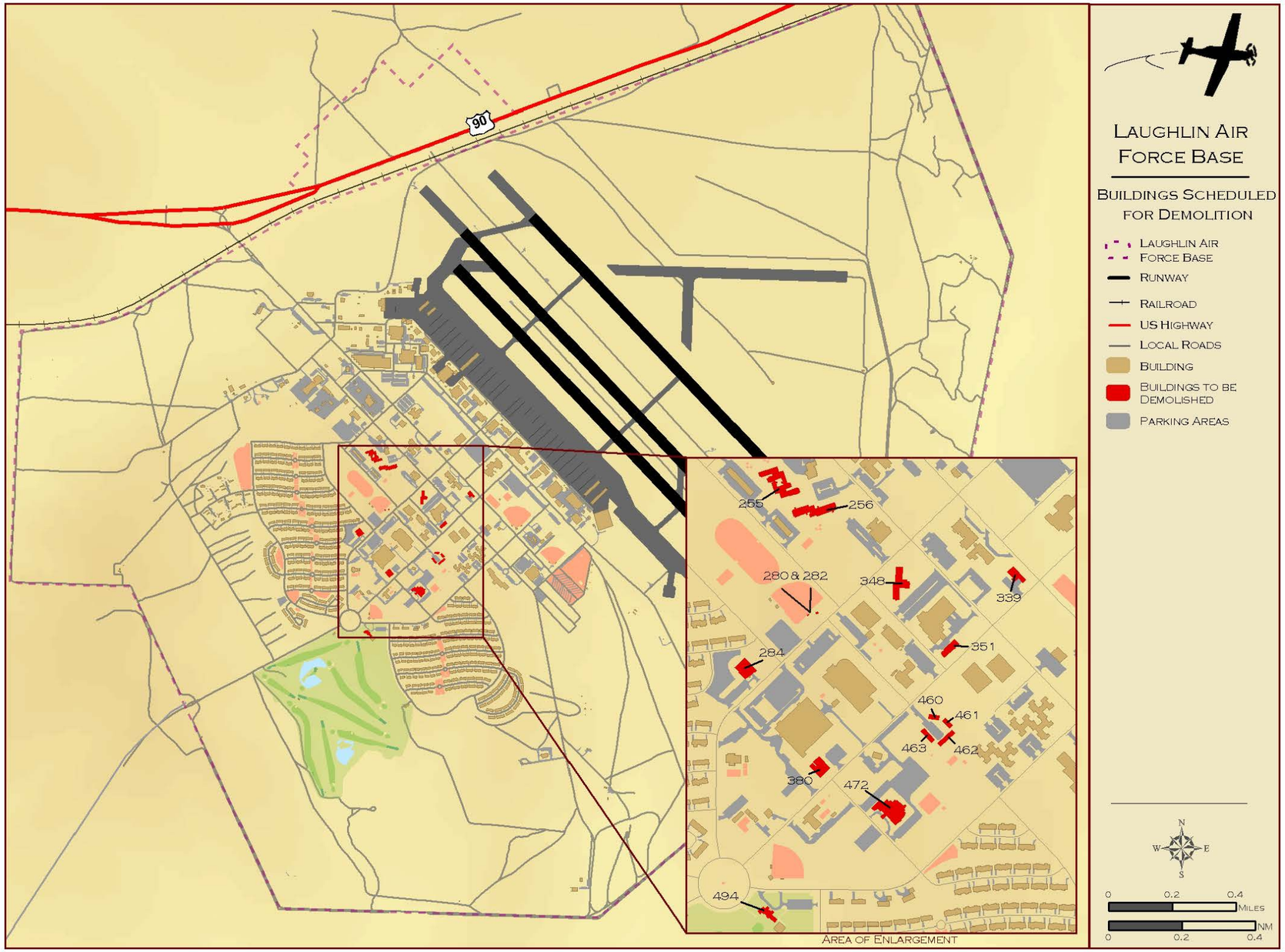
Fiscal Year (FY)	Building Number	Facility or Infrastructure	Action	Area Affected (SF)[a]	Additional Paved Area Added (SF)
2007	380	Addition to Aerospace Physiology	Add/alter by expanding the existing facility.	1,206	7,973
2007	476	Child Development Center	Add/alter by expanding the existing facility.	1,206	14,300
200	H2	Hangar 2	Add/alter by expanding the tool room in the maintenance facility.	750	14,300
2007	NA	Pave Road to Vortac	Currently the road is a gravel road. This road would be paved with asphalt.	0	65,000
2007	950	Munitions Cube	Construct an additional munitions cube in the existing ammunition storage area.	120	11,250
			Add/alter munitions storage to include four additional storage cubes.	480	0
2007/2008	NA	Unaccompanied Officers Quarters	Construct a 55 person, Unaccompanied Officers Quarters to house new mission personnel.	39,073	167,400
2007/2008	320	Student Training Complex, Anderson Hall	Add/alter by expanding the existing student complex.	10,473	28,600
2007/2008	52	Non-Destructive Inspection Shop	Add/alter by expanding the existing Non-Destructive Inspection facility.	3,251	28,600
2007/2008	328	Simulator Facility	Add/alter by expanding the existing simulator facility.	3,218	14,300
2007/2008	53	Fuels System Maintenance Facility	Add/alter by expanding the existing fuel systems maintenance facility.	3,305	28,600
2007/2008	NA	Aircraft Parking Apron	Add/alter aircraft parking apron by expanding the existing aircraft parking apron and installing new tie downs, striping, and six Centralized Aircraft Support System pedestals with electrical and air lines.	0	144,000
2007/2008	502	Aircraft Weather Shelter	Add/alter facility by expanding the existing Aircraft Weather Shelter.	13,735	0
2007/2008	201	Egress Shop	Add/alter Egress Shop.	3,660	28,600
2007/2008	413	Flight Line Shack	Expand facility.	600	0
2008/2009	NA	Storm Drain	Enclose the storm drainage channel from Colorado Avenue and Second Street to Indiana Avenue and Second Street. The storm drainage channel would then be covered with a parking lot. The long-term goal is to remove all Privately Owned Vehicle parking around facilities between First and Second Streets to increase force protection and decrease congestion along the flight line. This goal is currently being accomplished by removing sections of parking as old facilities are demolished and new facilities are constructed.	0	234,918
2008/2009	NA	Gasmask Confidence Chamber	Construct a Gasmask Confidence Chamber for military personnel to ensure proper fit and wear of the mask in a chemical environment. Facility would allow for the release of tear gas and camphor.	180	0
2008/2009	339	Office of Special Investigation Facility	Build facility to house the Office of Special Investigations currently located in one section of Building 339.	4,500	8,486
2008/2009	351	Base Theater	Demolition	5,000	0
2009/2010	241	Building 241	Construct an addition for communications.	16,000	19,058
2009/2010	348	Communications Facility	Demolition	11,000	0
2010	461	Temporary Living Facilities	Demolition	2,000	0
2010	462	Temporary Living Facilities	Demolition	3,000	0

Table 2-3 Proposed Action Construction Projects (Continued)

Fiscal Year (FY)	Building Number	Facility or Infrastructure	Action	Area Affected (SF)[a]	Additional Paved Area Added (SF)
2010	463	Temporary Living Facilities	Demolition	3,000	0
2010	460	Temporary Living Facilities	Demolition	2,000	0
2011	NA	Expansion of two existing entry gates	Expand Main Gate and West Gate, and relocate the north part of the Main Gate Air Park to south of the Main Gate.	303,360	75,000
2011/2012	280 and 282	Water Tower	Build a water tower to replace existing two towers. The location of the new tower would be adjacent to the existing towers to ease connection to the existing water distribution system.	4,000	0
2011/2012	380	Construct New Physiological Training Facility	A new facility would be constructed near the Campus Center to be collocated with other training facilities.	10,764	25,000
2011/2012	339	Communications Facility	Build a new facility to house telephone switching functions and to replace Building 339. The site would be close to the current facility due to the requirement to attach to the current telephone infrastructure.	5,000	50,000
2011/2012	339	Communications Facility	Demolition	6,000	0
2011/2012	380	Physiological Training	Demolition	9,000	0
2012	390	Youth Center	Addition to facility to include an enclosed basketball court.	7,280	0
2012	NA	Golf Course	Expand the Golf Course. Ample open space is located adjacent to the existing nine-hole course to allow the development of an additional nine-holes. Expansion would be to the west and southwest of the existing golf course.	3,876,840	0
2012	NA	Redesign Parking and Construct Pedestrian Walkway	Retain the Central Parking Area and reconfigure to include a landscaped central pedestrian corridor running from the new Wing Headquarters building through Heritage Park into the Control Tower and flightline. This wide pedestrian corridor would be landscaped with trees.	3,300	0
2012/2013	255 and 256	96-Person Enlisted Dormitory	Construct a new facility to house enlisted personnel supporting the current mission. The current dormitories, Buildings 255 and 256, were constructed in 1983 and 1984 respectively. Due to their age and usage they can no longer be cost effectively renovated to comply with the new dormitory standards. New dormitory would be located in vicinity of the existing enlisted dormitories.	75,347	20,000
2012/2013	472, 284, and 494	Consolidated Club	Construct a collocated club. The collocated club would replace Buildings 472, 284, and 494. The new club would be constructed adjacent to the golf course for ease of multi-use and greatly improve the quality of life for the base populace.	37,000	100,000
2013/2014	472	Club XL	Demolition	17,000	0
2013/2014	284	Club Amistad	Demolition	10,000	0
			Totals	**4,492,648**	**1,085,385**

Notes:
FY = Fiscal Year NA = Not Applicable SF = Square Feet
[a] This column represents a general affected area for each project. The intensity of construction over this area varies with project. The areas depicted in this column range from actual building footprint for some projects (e.g. dormitory construction), to a more general affected area for less intense development (e.g. golf course development).

Figure 2-1 Proposed Action Facility Demolition



(no document text this page)

2.3.3 Personnel Changes

Currently, there are 1,336 military and 1,864 civilian personnel assigned to Laughlin AFB. Including dependents, Laughlin AFB supports approximately 5,004 total personnel (USAF 2005a). The Proposed Action would result in an additional 178 full-time military and civilian personnel at Laughlin AFB. The distribution of civilian and military within the 178 added positions is not known at this time; however, the distribution is not expected to vary significantly from existing conditions.

2.4 DESCRIPTION OF OTHER ACTION ALTERNATIVES

2.4.1 Alternative 1 – Potential Development Alternative

The Potential Development Alternative (PDA) represents a broader approach to installation and mission development at Laughlin AFB. Under the PDA, the Air Force would still accommodate BRAC and CIP requirements in the Proposed Action; however, this alternative would also provide for additional installation development beyond those projects specifically identified in the Proposed Action.

2.4.1.1 Flying Operations

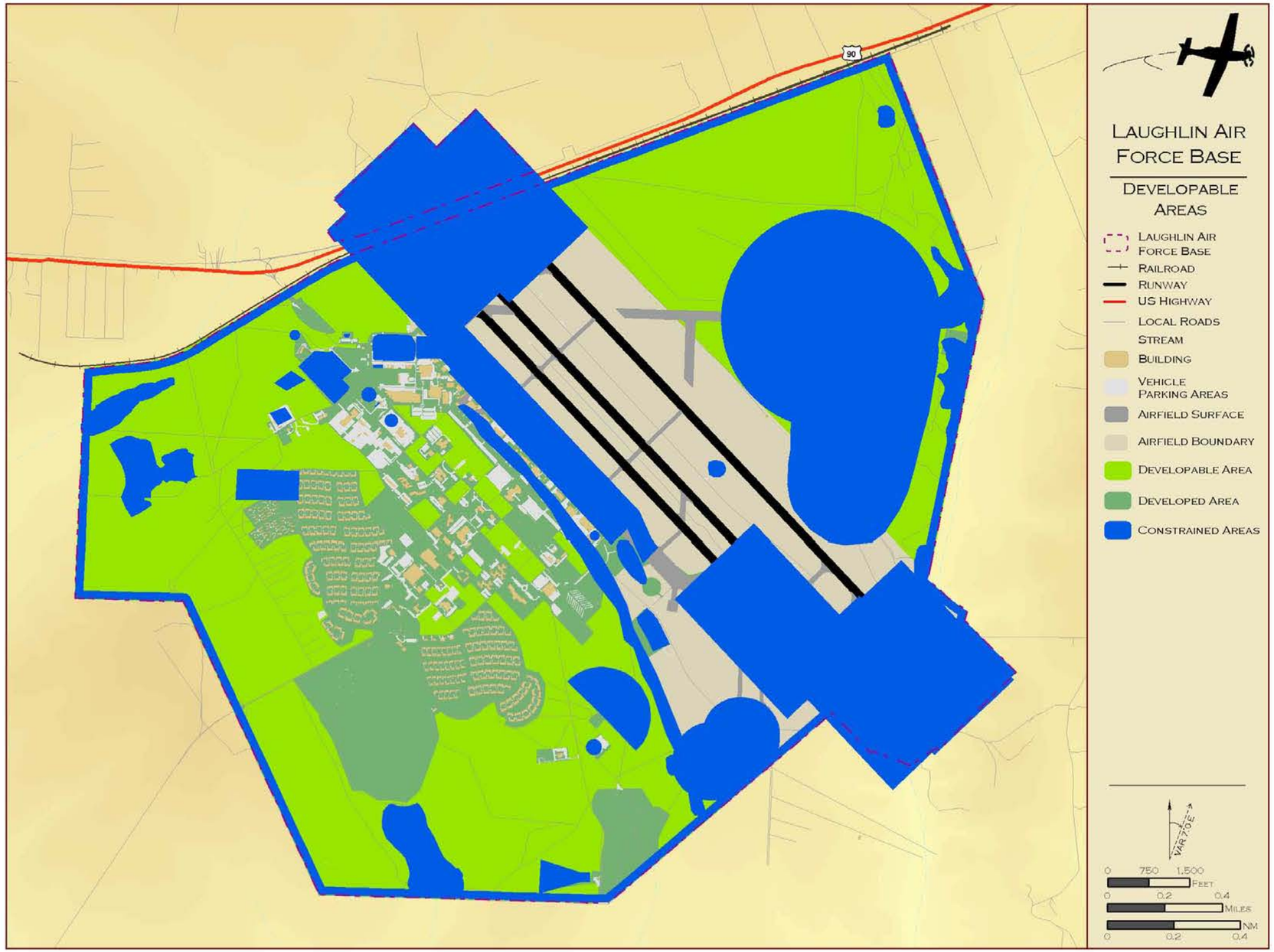
Flying operations under the PDA would be the same as those in the Proposed Action. See Tables 2-1 and 2-2 for a description of the aircraft counts and operations associated with the PDA.

2.4.1.2 Construction

Under the PDA, approximately 889 acres of land would be developed on Laughlin AFB. This development would result in an increase of approximately 131 acres of impervious cover, which would add approximately one million square feet of additional facility space to the installation. This would represent development of approximately 40 percent of the open space (2,258 acres) on Laughlin AFB and a 40 percent increase in the amount of facility space and impervious cover on Laughlin AFB. This development would occur only on developable land, which is defined as open space that is not subject to any land use compatibility or environmental constraints. Land use compatibility constraints include: Safety Quantity-Distance (QD) Arcs, Small Arms Range Safety Zones, Airfield Clear Zones, and a 150-foot antiterrorism/force protection (AT/FP) buffer zone along the installation perimeter. Environmental constraints include areas designated as wetlands or within the 100-year floodplain and ERP Sites and Areas of Concern (AOC). Figure 2-2 shows the developable land available on Laughlin AFB. Construction activities under the PDA are summarized by land use category in Table 2-4.

(no document text this page)

Figure 2-2 Developable Land on Laughlin AFB



(no document text this page)

Table 2-4 Potential Development Alternative Construction by Land Use Category

Land Use Category	FY 2006 Baseline			Potential Development Alternative- Change in Land Use Designation, Facility Space, and Impervious Cover			End State - Potential Development Alternative		
	Land (Acres)	Facility Space (SF)	Impervious Cover (Acres)	Land (Acres)	Facility Space (SF)	Impervious Cover (Acres)	Land (Acres)	Facility Space (SF)	Impervious Cover (Acres)
Administrative	22.6	145,430.0	5.1	8.9	57,054.9	2.0	31.5	202,484.9	7.1
Aircraft Operations and Maintenance	63.3	529,943.0	24.1	24.8	207,906.6	9.4	88.2	737,849.6	33.5
Airfield	1,429.6	10,663.0	202.5	560.9	4,183.3	79.5	1,990.4	14,846.3	282.0
Community Commercial	49.8	296,452.0	16.1	19.5	116,303.7	6.3	69.3	412,755.7	22.5
Community Service	13.6	38,972.0	2.8	5.3	15,289.4	1.1	18.9	54,261.4	3.9
Housing Accompanied	185.5	729,757.0	25.7	72.8	286,297.4	10.1	258.3	1,016,054.4	35.7
Housing Unaccompanied	40.7	346,886.0	10.8	16.0	136,089.9	4.2	56.7	482,975.9	15.0
Industrial	208.1	359,937.0	37.5	81.6	141,210.1	14.7	289.7	501,147.1	52.2
Medical	13.6	82,109.0	5.3	5.3	32,212.9	2.1	18.9	114,321.9	7.4
Open Space	2,257.5	0.0	0.0	(889.2)	0.0	0.0	1,368.3	0.0	0.0
Outdoor Recreation	239.8	17,200.0	4.7	94.1	6,747.9	1.8	333.8	23,947.9	6.5
TOTALS	**4,524.0**	**2,557,349.0**	**334.6**	**0.0**	**1,003,296.1**	**131.2**	**4,524.0**	**3,560,645.1**	**465.8**

Notes:
FY = Fiscal Year
SF = Square Feet

2.4.1.3 Additional Personnel

The PDA would result in an additional 410 full-time personnel at Laughlin AFB.

2.5 DESCRIPTION OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, the Air Force would not construct or alter any facilities or infrastructure at Laughlin AFB. The installation would not acquire aircraft and personnel associated with the new IFF mission, and the current mission would continue to operate within existing facilities. Aircraft counts, Aircraft Operations, and Land Development Intensities would remain as indicated in the FY 2006 baseline columns of Tables 2-1, 2-2 and 2-4, respectively. As a result, neither BRAC requirements, nor CIP projects would be implemented.

2.6 OTHER ACTIONS ANNOUNCED FOR LAUGHLIN AFB AND SURROUNDING COMMUNITY

This EA also considers the effects of cumulative impacts (40 CFR 1508.7) and concurrent actions [40 CFR 1508.25(1)], if any are applicable to the proposed or alternative actions. A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is 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 regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Other actions announced for Laughlin AFB that could occur in the reasonably foreseeable future or during the same time period as the proposed or alternative actions are identified in Table 2-5. This table also includes the estimated total square feet of construction and demolition associated with each project. No past, present, or reasonably foreseeable future projects were identified for the surrounding community as a result of the IICEP scoping process.

Table 2-5 Concurrent Actions on Laughlin AFB

Project Description	New Construction (SF)	Demolition (SF)
Construction of a Service Station Inside Building 2109	NA	NA
Construct T-1 Squadron Operations Facility	23,000	7,449
Demolition of the Operations Group Lounge	NA	1,680
Demolition of the Religious Educations Center	NA	4,370
Construction of an Aircraft Maintenance Operations Center (including demolition of Buildings 204 and 215)	21,520	11,174
Squadron Operations Facility for 96th Flying Training Squadron Reserves	3,650	N/A
Construct consolidated Student Activity Education Center (including demolition of Building 257)	17,840	13,843
Golf Course Maintenance Facility Renovation (including demolition of Building 595)	5,500	1,400
Construction of an Automated Car Wash	1,500 (3,250 SF of additional asphalt)	NA
Alter Building 7 Contracting	1,000	NA
Demolition of Buildings 31600, 255, and 256	N/A	74,532
Construction and Renovation of Various Facilities at Marina	292,325	3,706
TOTAL	**366,335**	**118,154**

Notes:
NA = Not Applicable
SF = square feet

The actions identified above are addressed from a cumulative perspective in this EA. The impacts of past actions are included in the baseline.

2.7 COMPARISON OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

Table 2-6 summarizes the impacts of the Proposed Action, Alternative 1, and the No Action Alternative.

2.8 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The preferred alternative is the Proposed Action.

2.9 MITIGATION MEASURES

Table 2-7 presents mitigation measures and best management practices (BMPs) anticipated for impacts incurred under the Proposed Action, Alternative 1, and the No Action Alternative.

(no document text this page)

Table 2-6 Summary of Environmental Impacts

Resource	Proposed Action Implement BRAC and CIP	Alternative 1 Potential Development Alternative	No Action Alternative
Airspace Use and Management	Aircraft operations would increase by 21 percent. While notable, this level of activity would not be sufficient to make the airspace surrounding Laughlin Air Force Base (AFB) or Del Rio International Airport a candidate for Class B airspace. Laughlin AFB Military Operations Area utilization would increase but would not be expected to restrict the movement of other air traffic in the area.	Same as Proposed Action.	No change.
Noise	The noise contours would increase slightly. Increased noise levels at sensitive noise receptors due to aircraft operations would not beexpected to be perceptible. Short-term, minor impacts associated with construction noise would increase, but would be minimal given the existing noise environment on the installation.	Same as Proposed Action, except impacts associated with construction activities would be somewhat higher.	No change.
Land Use	No adverse impacts would be expected as a result of land use changes. The Proposed Action would be compatible with existing land use planning guidance.	Same as Proposed Action.	No change.
Air Quality	There would be a short-term increase in air emissions associated with the construction, renovation, and demolition activities. These emissions would cease upon completion of the projects, and would contribute only a small percentage to regional emissions. There would be a long-term increase in air emissions due to an increase aircraft operations and vehicles. However, the increase in emissions would contribute only a small percentage to regional emissions, and would not be expected to cause the region to exceed air quality standards. The Proposed Action would occur in an attainment area, would not be subject to a conformity analysis, and would not expose the public or operational personnel to hazardous levels of air emissions.	Same as Proposed Action	No change.
Earth Resources	There would be short-term, minor soil disturbance as a result of the proposed construction activities. The soils in the vicinity of the proposed construction projects at Laughlin AFB have been previously disturbed and the projects would be located in improved areas with existing facilities and paved roads. Impacts would include increased soil erosion and fugitive dust emissions that would be minimized through the implementation of Best Management Practices (BMPs).	Similar to Proposed Action except that exact locations of construction activities are not known. Projects under this alternative could potentially occur in areas of the installation that have not been previously developed. However, no major changes to topography would be expected. Therefore, minor adverse impacts would be localized to each site of construction and controlled using BMPs to reduce wind and runoff erosion.	No change.
Biological Resources	Implementation of the Proposed Action would have minimal effects on the biological resources at Laughlin AFB. The Proposed Action would result in developing approximately 178 acres of open space. The proposed construction and renovation projects would occur within the cantonment area of Laughlin AFB, a previously disturbed area characterized by landscaping among buildings, roads and parking areas. No known or suspected federally threatened or endangered species are thought to inhabit the project areas. Noise created during construction activities would temporarily disturb wildlife near the construction areas; however, this disturbance would be expected to be short-term and minor given the existing noise environment adjacent to an active airfield..	Implementation of Alternative 1 would have potential minor effects on the biological resources at Laughlin AFB. This alternative proposes to develop 889 acres (approximately 40 percent) of the current open space areas but the intensity of this development would vary. Development would not occur in environmentally sensitive areas such as wetlands, floodplains, and areas of suitable habitat or known locations of threatened and endangered species. Wildlife present in more intensely-developed land uses would relocate to other areas on or off the installation.	No change.
Cultural Resources	There would be no impacts to historic or archeological resources as a result of the Proposed Action. The buildings and structures proposed for demolition or alteration are not eligible for listing in the National Register of Historic Places and the project sites would not be near known archeological resources. Additionally, there would be a low potential to identify or discover any new or unknown sites during construction or demolition activities as investigations have indicated that the areas have been disturbed and exhibit no potential for intact deposits.	Same as Proposed Action.	No change.
Water Resources	There would be a potential for short-term increases in the sediment loading of surface water as a result of demolition and construction activities. These increases would be managed through implementation of a Storm Water Pollution Prevention Plan along with the incorporation of BMPs for sediment control during construction. There would be a seven percent increase in impervious cover in the installation resulting in increased runoff volumes. There would be no impacts to the quality or quantity of groundwater at Laughlin AFB or the surrounding area. There would be no impacts to floodplains.	Same as Proposed Action except for the increase in the amount of surface water runoff resulting from a 40 percent increase in impervious cover. No long-term adverse impacts on surface water quality or quantity on Laughlin AFB or downstream surface water bodies.	No change.
Hazardous Substances	Contractors would oversee the management of asbestos-containing material, lead-based paint, and hazardous materials and waste. Management of these materials and waste streams would occur under the existing Laughlin AFB management programs and would not result in long-term impacts.	Same as Proposed Action.	No change.

Table 2-6 Summary of Environmental Impacts (Continued)

Resource	Proposed Action Implement BRAC and CIP	Alternative 1 Potential Development Alternative	No Action Alternative
Safety	Annual hours flown for T-6 Texan II and T-38C Talon would increase by 22 and 21 percent. Based on the mishap rates for these aircraft, the frequency of a Class A or B mishap for the T-6A Texan II would increase from one every 2.76 years to one every 2.26 years. For the T-38C Talon, aircraft mishaps would be expected to increase from one every 7.24 years to one every 6 years; however, continued implementation of the installation flying safety program could reduce the mishap rates for both aircraft. Also, increased risk of a bird/wildlife-aircraft strikes could occur, however, continued implementation of the installation Bird Aircraft Strike Hazard Plan would minimize conditions giving rise to incidents involving birds and wildlife. Quantity Distance arcs for Building 950 and additional munitions cubes facilities may require expansion. These facilities are located in a relatively remote area of the installation, and would not be expected to create any land use incompatibilities. There would be short-term, minor adverse effects to safety due to the temporary increase in construction activities. Construction contractors would be required to establish and maintain safety programs that would provide protection to their workers and limit the exposure of base personnel to construction hazards.	Flying operations would be the same as Proposed Action. Short-term, minor safety impacts would be slightly higher than the proposed action due to the increased amount of construction.	No change.
Utilities and Infrastructure	There would be minor, long-term increase in potable water consumption and a minor, long-term annual increase in wastewater generation. There would also be a minor, short-term increase in solid waste; minor, long-term impacts to drainage system due to additional impervious surface; minor long-term increase in traffic counts on the installation and in the local area; and minor, long-term increases in overall electrical and natural gas consumption.	Same as the Proposed Action, except slight increase in consumption and generation of all utilities. Also, there would be a slight increase in traffic counts.	No change.
Socioeconomic Resources	There would be a minor, long-term increase to the population in the local community; minor long-term impact on housing within the general community due to decrease in off-base housing units available to the general public; long-term increase in area school populations due to the enrollment of an additional 80 children in the San Felipe Del Rio Consolidated Independent School District (CSID), and positive short- and long-term impacts to the local economy.	Same as the Proposed Action, except that the population of Val Verde County would increase by an additional 197 people. It is assumed that a portion of the overall installation development would include construction of additional Military Family Housing and unaccompanied housing to accommodate additional personnel. There would be a long-term increase in area school populations due to the enrollment of an additional 69 children in the San Felipe Del Rio CISD, and increased positive short-and long-term impacts to the local economy.	No change.
Environmental Justice and Environmental Health and Safety of Children	There would be short-term increases in air and noise emissions for the duration of construction activities. Short-term solid waste impacts are limited to the construction and established disposal sites. Short-term traffic congestion would increase on the installation and would equally affect all who use those roads. Expenditures associated with project activities would have a short-term positive impact on the local economy. All minor and short-term adverse impacts would affect all population groups in the region of influence equally.	Same as Proposed Action.	No change.

Notes:
AFB = Air Force Base
BMPs = Best Management Practices
CISD = Consolidated Independent School District

Table 2-7 Summary of Mitigation and Best Management Practices

Resource	Mitigation and Best Management Practices (BMPs)
Airspace Use and Management	No mitigation measures are necessary. The Air Force would continue to publish and distribute Mid-Air Collision Avoidance guides to pilots containing information on preferred flight tracks, operational characteristics of high-performance military aircraft, and, points of contact to ascertain real-time status of Special Use Airspace.
Noise and Land Use	Laughlin Air Force Base (AFB) tends to mitigate adverse noise effects and annoyance in that very few flight operations and ground engine runs occur between 2200 hours and 0700 hours. BMPs include restricting the operation of extremely noisy equipment (e.g., brick cutters or jackhammers) before 0900 hours and after 1700 hours. Other practices include properly operating and maintained equipment (e.g., possessing mufflers, gaskets, sharpened and lubricated blades), maximizing the distance of loud equipment from a residence, directing equipment to use less noise-sensitive routes, fitting silencers to combustion engines, fastening machinery covers or panels tightly, isolating vibrating parts and damping, constructing sound barriers to reduce propagation, or shutting off or idling machinery between work periods are other suggestions to reduce construction-associated noises and disturbances. Upon completion of the beddown activities, an updated Air Installation Compatible Use Zone study would be prepared and updated noise contours and compatible land use planning recommendations would be furnished to the adjacent municipalities.
Air Quality	No mitigation measures are necessary. BMPs to minimize fugitive dust emissions would include watering the disturbed construction area, covering dirt and aggregate trucks and/or piles, preventing dirt carryover to paved roads, and using erosion barriers and wind breaks.
Earth Resources	No mitigation measures are necessary. Proposed construction projects would include site-specific sediment and erosion control plans that detail BMPs to prevent soil disturbance, capture and contain loose soil, and slow the movement of storm water during heavy rains. Fugitive dust from construction activities would be minimized by watering and soil stockpiling, thereby reducing the total amount of soil exposed to wind.
Biological Resources	If Alternative 1 were implemented, it would be recommended that the project areas be surveyed for suitable habitat or locations of threatened, endangered, or species of concern prior to site planning or ground disturbance. If species of concern are found within the project areas, consultation with United States Fish and Wildlife Service should occur.
Cultural Resources	No mitigation measures or BMPs are necessary.
Water Resources	No mitigation measures are necessary. Proposed construction projects would include site-specific sediment and erosion control plans that detail BMPs to prevent soil disturbance, capture and contain loose soil, and slow the movement of stormwater during heavy rains. In order to minimize the potential for increased total suspended solids in downstream surface water bodies, a Storm Water Pollution Prevention Plan should be implemented. No mitigation measures are necessary for ground water and floodplains.
Hazardous Substances	No mitigation measures are necessary with regard to hazardous materials and wastes. In the unlikely event groundwater was encountered, care would be taken during demolition and construction activities to ensure that groundwater resources are protected from contamination and that workers are protected from contaminated groundwater.
Safety	No mitigation measures are necessary. Ground and Flight Safety programs would continue to ensure that all installation operations are conducted in the safest manner possible. Construction contractors would develop and implement safety plans for each construction project.
Utilities and Infrastructure	No mitigation measures or BMPs are necessary.
Socioeconomic Resources	No mitigation measures or BMPs are necessary.
Environmental Justice and Environmental Health and Safety of Children	No mitigation measures or BMPs are necessary.

Notes:
AFB = Air Force Base BMPs = Best Management Practices

(no document text this page)

Chapter 3

Affected Environment

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the current conditions of the environmental resources, either manmade or natural, that would be affected by implementation of the Proposed Action or alternatives. Section 3.3 focuses on the conditions at Laughlin AFB and, where applicable, in the surrounding community. The baseline conditions presented in this chapter are described to the level of detail necessary to support analysis of potential impacts presented in Chapter 4, Environmental Consequences.

3.2 INSTALLATION LOCATION, HISTORY, AND CURRENT MISSION

Laughlin AFB is headquarters for the 47th FTW and the primary mission is to train Air Force pilots through the SUPT program. Laughlin AFB is located in Val Verde County, six miles east of Del Rio, six miles northeast of Ciudad Acuña, Mexico, and 150 miles west of San Antonio, Texas, the closest metropolitan center (USAF 2006b).

Laughlin Field was established in 1942 as a training base for pilots of the Martin B-26 bomber during World War II and closed in 1947. The installation was re-opened in 1950 as Laughlin AFB with a primary mission of pilot training. The installation was also home to reconnaissance aircraft during the 1950s. In 1963, Laughlin AFB was transferred to Air Training Command with a sole mission of pilot training that has remained to this day. In 1993, the 47th FTW was realigned under Air Education and Training Command. This realignment also saw the introduction of the SUPT program, which addressed both the primary and advanced training needs of student pilots to better prepare them for their future roles in the United States Air Force (USAF 2006b).

3.3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.3.1 Airspace Use and Management

3.3.1.1 Definition of Resource

Airspace management and use addresses how and in what airspace the aircraft operating at Laughlin AFB would fly. This section of the EA examines the rules, regulations, and procedures to permit the military aircraft to operate safely among all aircraft in the National Airspace System. Airspace management and use is interrelated to other resources and topics including, but not limited to: safety, land use, noise, air quality, and biological resources.

3.3.1.2 Characteristics of Airspace

The Federal Aviation Administration (FAA) has primary jurisdiction over the management of airspace. They classify airspace based upon whether it provides Air Traffic Control (ATC) separation within it or not—controlled versus uncontrolled airspace. In addition, the FAA

designates SUA when it removes a volume of airspace from the public domain, excluding other users and allocating it for the benefit of a particular category of user, such as the military.

3.3.1.3 Controlled Airspace

Controlled airspace is a particular geographic dimension within which the FAA may exercise ATC and provide separation to certain aircraft. It is a generic term encompassing five classifications that relate to the level of service provided and degree of regulation imposed. Among the classifications, there are varying levels of minimum airmen certification ratings, aircraft equipment, and required communications. Most airspace that is greater than 1,200 feet above the ground is controlled airspace and in the vicinity of busier airports, controlled airspace extends all the way to the surface. For example, the airspace immediately surrounding and over Laughlin AFB is Class C airspace. A control tower and a radar approach and departure control facility provide certain aircraft separation services. Pilots are required to communicate with ATC when operating within this class of airspace and their aircraft must be equipped with transponders that identify aircraft to ATC.

3.3.1.4 Uncontrolled Airspace

Uncontrolled airspace also has a particular geographic dimension; however, no ATC separation is provided. This airspace exists at the surface of the earth in rural areas and many smaller general aviation and military airfields lie within uncontrolled airspace. No particular clearance or communication requirements exist for operations within uncontrolled airspace. The FAA has designated only one type of uncontrolled airspace, Class G.

3.3.1.5 Special Use Airspace

SUA is a generic term for airspace that has a particular geographic dimension that has been designated either to contain particular hazardous activities or to exclude non-participating aircraft, or both. Restricted (R-) Areas and Military Operations Areas (MOAs) are two examples of SUA. The geographic limits of a given SUA do not correlate to whether airspace is controlled or uncontrolled. Within a MOA, non-participating instrument flight rules (IFR) traffic is rerouted around the MOA for those periods that the airspace is active. Traffic operating under visual flight rules (VFR) is not restricted; however, MOAs are charted and pilots are strongly encouraged to avoid active MOAs because the activities occurring therein (acrobatics, formation flights, etc.) do not mix well with civilian air traffic.

3.3.1.6 Region of Influence (ROI)

The ROI for airspace includes Laughlin AFB and vicinity and the military training airspace within which the military aircraft would fly. This airspace includes the area around Laughlin AFB and SUA associated with the 47th FTW, Laughlin 1, 2 and 3 MOAs. The Proposed Action involves aircraft operations in both a Class C terminal airspace setting and in training airspace. The Laughlin AFB Class C airspace extends outward on a 10-mile radius from the airfield, except as constrained by the international boundary with Mexico. Therefore, the ROI for this action is the area that generally is within 10 miles of the airfield, and MOAs.

3.3.1.7 Laughlin AFB and Vicinity

Laughlin AFB is the primary airport for which the Class C airspace was created, and other airports in the region are the satellite airports. A significant satellite airport with commercial air carrier service is Del Rio International Airport, located approximately eight nautical mile(s) (NM) west of Laughlin AFB. Figure 3-1 depicts the airfield at Laughlin AFB and Figure 3-2 shows the airspace and airports in the Del Rio, TX metropolitan area. In addition to Laughlin AFB and Del Rio International, there is a second military airfield (Spofford Auxiliary Airfield) and numerous private airfields with paved and unpaved runways in the region (FAA 2006a). (See Table 3-1 for military and public use airfield data).

Table 3-1 Public Use and Military Airports in the vicinity of Del Rio, TX

Name	ID	Surface Airspace	2006 Operations Count	Distance from Laughlin AFB	IFR Approach	Longest Runway (feet)
Laughlin AFB	KDLF	Class C	504,336	NA	Precision	8,857
Del Rio International	KDRT	Class E	15,330	8 NM West	Non-Precision	6,300
Spofford Auxiliary Field	KSPF	Class D/E	69,639	21 NM Southeast	None	6,277
Edwards County	KECU	Class G	24,820	47 NM East	Non-Precision	4,050
Garner	KUVA	Class G	12,410	54 NM East	Non-Precision	5,255
Sonora	KSOA	Class G	9,855	73.9 NM	Non-Precision	4,035

Source: FAA 2006a, 2006b; Air Force 2006a
Notes:
AFB = Air Force Base
ID = Identification
IFR = instrument flight rules
NA = Not Applicable
NM = nautical miles

The airfield at Laughlin AFB is one of the busiest in the military, and would rank between Detroit and Charlotte in terms of its annual aircraft operations counts. The airfield consists of three parallel runways, relatively closely spaced together (Figure 3-1). Runway 13R/31L is the innermost or inside runway (with respect to the aircraft parking ramps and hangars). Except in emergencies, the T-6A Texan II is the only aircraft authorized to use this runway, primarily due to its length. Runway 13C/31C is the center runway, to which transient aircraft and instrument arrivals occur. Accordingly, a variety of aircraft types use this runway and during periods of less favorable weather conditions, it becomes the preferred runway in use. Runway 13L/31R is the outermost runway (again, with respect to the aircraft parking ramps and hangars). As with the innermost runway, this runway is nearly exclusively used only by one type of aircraft, in this case the T-38C Talon. Runway 13L/31R is longer than the inner runway and is configured with the requisite safety equipment and cabling for high performance aircraft operations. The

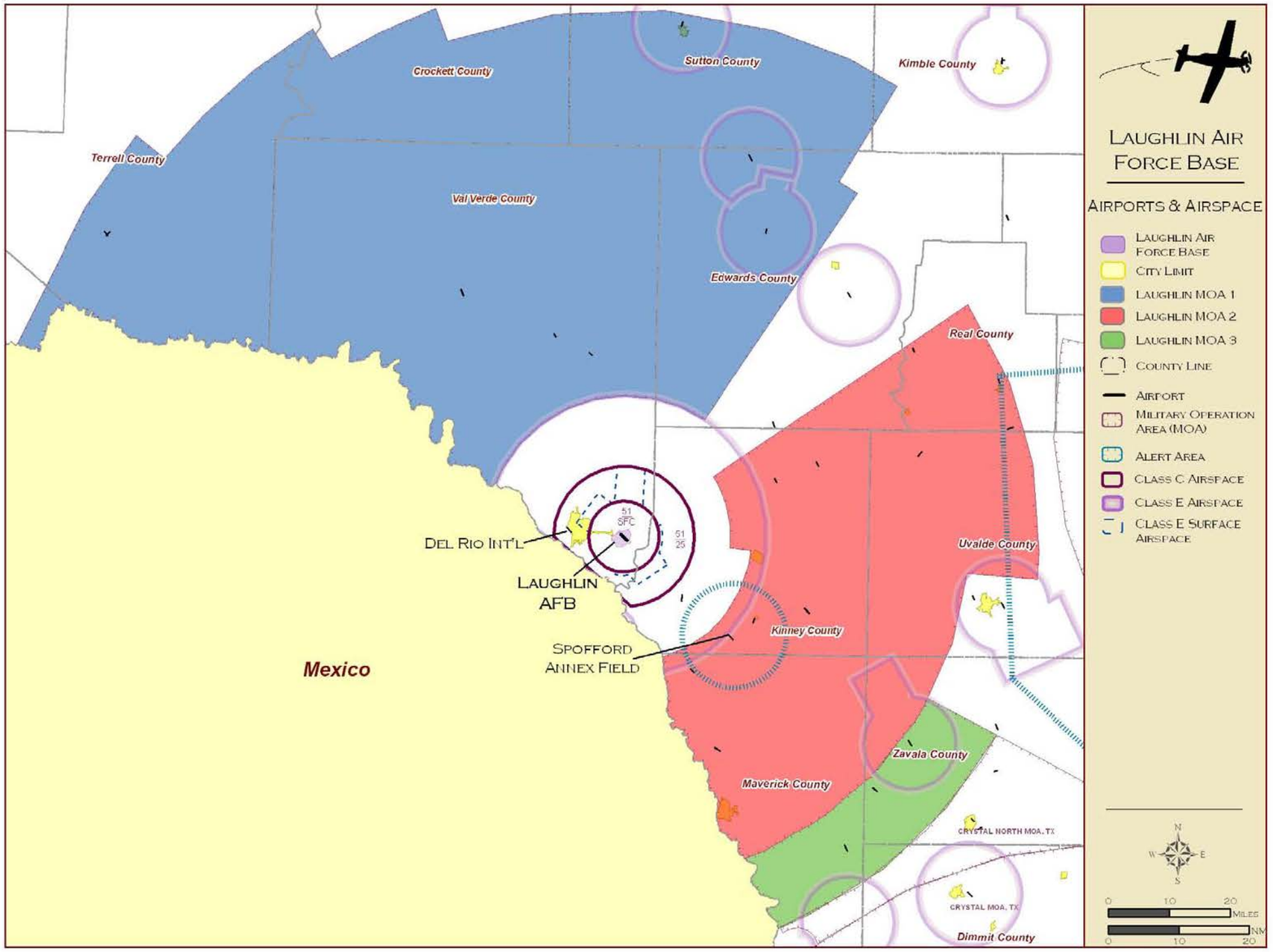
runways are each 150 feet wide and from centerline to centerline the distance separating them ranges from 500 to 1,000 feet.

Figure 3-1 Airfield Layout – Laughlin AFB

Source: FAA 2006a, 2006b

(no document text this page)

Figure 3-2 Airports and Airspace Setting in the Vicinity of Laughlin AFB



Source: FAA 2006a, 2006b

(no document text this page)

The Laughlin Class C airspace is designed to accommodate the military training mission performed by the 47th FTW and the regional commercial and general aviation activities. The inner rings of Class C airspace extend from the surface to 5,100 feet above mean sea level (msl) and extends outward 5 NM from the primary airport. An outer shelf, extending from 2,500 msl to 5,100 msl, runs outward a distance ranging from 5 to 10 NM from the primary airport.

Underlying the Laughlin Class C airspace west of the primary airport is Del Rio International Airport. This airfield is the commercial air carrier airport for the region; however, it does not generate sufficient air traffic to warrant the establishment of an ATC tower. The Laughlin Radar Approach Control (RAPCON) provides Class C services to participating VFR aircraft and arrival and departure control services to IFR aircraft using this airport. The airspace associated with Del Rio International Airport is Class G from the surface to 700 feet above ground level (AGL) and Class E from 700 feet AGL to 1,500 feet AGL (2,500 msl) to the overlying Class C airspace shelf.

3.3.1.8 Military Training Airspace

The 47th FTW aircraft primarily use the Laughlin MOAs to perform their training SUPT training syllabus. The Laughlin 1 MOA lies northwest of the airfield beginning at an arc 20 NM from Laughlin AFB and extending outward 65 NM to an outer arc that is staggered, varying from 85 to 75 NM from the airfield. Its floor is 9,000 msl and it extends to the floor of the overlying Class A airspace at 18,000 msl. The Laughlin 2 and 3 MOAs lie southeast of the airfield, beginning at staggered arcs that range between 15 and 18 NM from the airfield and extending outward between 31 and 43 NM. The floor of the Laughlin 2 and 3 MOAs are 7,000 msl and they extend up to 18,000 msl. The MOAs are internally subdivided with into blocks of training airspace and ingress and egress corridors to facilitate their use and management. Assignment of training airspace blocks to particular aircraft is performed by the Laughlin RAPCON. Other charted SUA airspace in the Del Rio metropolitan area includes three Alert areas: one in the vicinity of Laughlin AFB, one in the vicinity of Spofford Auxiliary Airfield and a considerably larger one 100 NM to the east, associated with the flying units at Lackland and Randolph AFBs in San Antonio.

In addition to the previously mentioned MOAs and alert areas, additional SUA east of Laughlin AFB (Kingsville MOAs—associated with flight training occurring at Naval Air Station Kingsville and the Randolph MOAs—associated with Randolph AFB) are available for use by the 47th FTW. The existing SUPT mission does not require their use. The IFF beddown associated with the BRAC actions would require the use of a Restricted Area, R-6312 which was established to protect the air to ground ranges. The Navy manages this airspace and is currently assessing the effects from proposed usage of their range by T-38C Talon aircraft from Laughlin AFB and from Randolph AFB.

3.3.2 Noise

3.3.2.1 Definition of Resource

Noise is defined as a sound that, if loud enough, can induce hearing loss or is otherwise undesirable because it interferes with ordinary daily activities, such as communication or sleep. A human's reaction to noise varies according to the duration, type, and characteristics of the source; distance between the source and receiver; receiver's sensitivity; background noise level; and time of day. To quantify noise and describe its effects on the natural and human environment, a basic description of sound terminology is presented.

Sound is a series of vibrations (energy) transmitted through a medium (such as air or water) that are perceived by a receiver (e.g., humans). It is measured by accounting for the energy level represented by the amplitude (volume) and frequency (pitch) of those vibrations and comparing that to a baseline standard. As a sound wave moves through the atmosphere, a temporary increase in pressure occurs; it is the pressure change that is detected as sound. The magnitude of the pressure change is the loudness and the frequency of the temporary changes is the pitch. The human ear can detect pressure differences over a wide range of sensitivities. For example, a whisper heard two meters away creates a pressure change from standard atmospheric pressure of approximately 0.0006 Pascals, whereas an M16 rifle at the firer's ear creates a change of 1,000 Pascals. Although one event represents 1,666,666 times more energy than the other, both represent sounds that can be heard by a human ear. A method for readily comparing these vast pressure differences is to describe them in exponential rather than linear terms. This simplifies the units and more closely depicts the way humans actually perceive sound levels. The decibel (dB) is a logarithmic ratio of the increase in atmospheric pressure a sound event causes compared to a defined reference pressure, which happens to be the lowest detectible pressure recognized by the human ear (0.00002 Pascals). When using decibels to depict airborne sound pressure levels (SPLs), 0 dB is the threshold of human hearing and exponential increases occur every 10 dB. An event that generates 60 dB of sound is 10 times louder than one that generates 50 dB. In the example above, the whisper (0.0006 Pascals) translates to 29 dB and the M16 rifle shot (1,000 Pascals) is 153 dB.

The SPL represented by a given decibel value is usually adjusted to make it more relevant to sounds that the human ear hears especially well; for example, an "A-weighted" decibel (dB[A]) is derived by emphasizing mid-range frequencies to which the human ear responds especially well and de-emphasizing the lower and higher range frequencies. In addition to weighting based on frequency, sound levels are further differentiated by factoring in the effect of time since sound levels normally vary in intensity and are not continuous.

The building block of noise metrics used in describing aircraft noise is the A-Weighted Sound Level. It simply describes in terms of A-Weighted dB a SPL at any given moment in time. From this building block, several other metrics are derived.

> The *Maximum Sound Level (L_{max})* is the peak value of all the *A-Weighted Sound Levels* that occurs during a noise event. The limitation of this metric for noise (annoyance) analysis is that peak sound level without a context of duration or time of day does not adequately address annoyance. For example most would agree that a single 140 dB

Lmax event lasting three seconds (i.e. an aircraft flyover) that occurs once per day around 1300 hours is less annoying than a 95 dB L_{max} event (a jackhammer in a construction site) that lasts for six hours, every day and occurs at 2300 hours.

The *Equivalent Sound Level (L_{eq})* reflects the average continuous sound. It is a metric that takes into account both intensity of an event and duration. The metric considers variations in sound magnitude over periods of time, sums them, and reflects, in a single value, the acoustic energy present during a specified time period. Common time periods for averaging are one, eight, and 24-hour periods.

The *Sound Exposure Level (SEL)* is a specific type of L_{eq} that describes a receiver's cumulative exposure over the course of an event and compresses that energy into a one-second period. For noise events whose duration is greater than one second, the *SEL* will be greater than the L_{max}. Conversely events with durations shorter than one second the SEL will be less than the L_{max}. SEL is a very useful metric for predicting short-term activity interruption or reaction by wildlife to a noise stimulus. It is used to allow direct comparison of events having varying intensities and durations, such as an aircraft overflight, by calculating SELs of those events. The fact that SEL is a cumulative metric means that louder events have greater SELs than do quieter events and longer events have greater SELs than do shorter events.

SELs vary according to the aircraft and engine type, engine power setting, aircraft speed, and slant distance (i.e. the distance between the aircraft and the observer). It is a very useful metric for prediction of activity interruption in humans and varied physiological responses in wildlife. Use of SEL allows direct comparison between sounds with varying levels and durations by converting them to exposure levels. Table 3-2 contains SELs for aircraft at typical takeoff speeds and power settings at various altitudes directly above the listener.

Table 3-2 Sound Exposure Limits dB(A)[a]

Aircraft	Speed (knots)	Power	100 Feet AGL	500 Feet AGL	1,000 Feet AGL	5,000 Feet AGL
T-1	160	99% NF	111.2	99.3	92.9	79.1
T-6	160	91% torque	104.7	94.0	88.8	75.5
T-38C	160	99% NC –A/B 99% NC	126.9	115.7	110.1	85.8

Notes:
AGL = above ground level
dB(A) = "A-weighted" decibel
NC = percent in core
NF = percent at fan
NC – A/B = percent in core and afterburner (1000 feet AGL and below)
% = percent
[a] Sound levels calculated using SELCALC software; speed and power settings used are typical for takeoff for each aircraft type.

While the above metrics are useful at describing instantaneous, peak or even comparative noise events, they do not account for multiple event occurrences, the diminution of background noise during nighttime periods, or the increased annoyance expressed with events that occur during

nighttime periods when many people are sleeping. Therefore an additional metric that accounts for cumulative (or repetitive) exposure, time of day, intensity and duration is used.

> The *Day-Night Average Sound Level (DNL or L_{dn})* describes a receiver's cumulative noise exposure from all events occurring during a 24-hour period; events occurring between 2200 hours and 0700 hours ("environmental night") are increased by 10 dB to account for greater nighttime sensitivity to noise events. If there were no noise events occurring during the nighttime period, DNL and $L_{eq(24)}$ would be equal.

Because of the logarithmic nature of the decibel, this means that a single nighttime event creates the same DNL as 10 identical events during the day. The DNL is used in this assessment when describing noise from aircraft. For temporary, intermittent noise events the L_{max} or SEL is a more useful metric and they are used for assessing the effect to the noise environment from operation of construction equipment and similar activities.

The use of these noise metrics is chosen based on federal guidelines developed in order to be able to quantify noise and the reaction of those exposed to it in a community in a sound, objective, and scientifically valid fashion. The federal government established a working group to review the science of noise and recommend standards for its agencies to use when assessing the effects from noise. The Federal Interagency Committee on Noise (FICON) reviewed the existing science on the subject of urban, industrial, and aircraft noise, land use compatibility, and health and human safety and validated the use of DNL as the appropriate metric for describing noise from aircraft operations and assessing its effects. The DoD uses DNL as its common metric to describe noise exposure when describing and assessing noise from aircraft overflights, range operations, and other similar discontinuous but repetitive occurrences. Within the DoD, the Air Installation Compatible Use Zone (AICUZ) program that assesses noise related specifically to aircraft and range operations has been developed and adopted by its services, including the Air Force (DoD 1977). AICUZ studies assess predicted noise exposure in terms of DNL. The DNL metric has also been adopted by the United States (US) Department of Housing and Urban Development (HUD), the FAA, and the United States Environmental Protection Agency (USEPA) as a common standard for assessing noise levels for compatibility with land uses, health and human safety, and effects on wildlife.

The DoD AICUZ program outlines compatible land uses by first predicting noise exposure zones or contours depicting lines of equal noise exposure that would result from normal operations at a particular place, and then by recommending land uses that are ordinarily considered compatible with the predicted noise exposure level for those locations contained within the noise contours (DoD 1977 and USAF 1999). In addition to assessing land use compatibility from the perspective of noise, the DoD AICUZ program assesses accident potential and outlines compatible uses in those areas nearest to the runway ends.

The Air Force AICUZ program is that service's implementation of the DoD directive to assess and disclose noise created by operations on an installation with the goal of preventing the encroachment of incompatible uses on the surrounding areas in a way that ultimately compromises the viability of the installation. The Air Force AICUZ program predicts noise exposure by modeling aircraft operations and employing four bands of noise exposure: 1) 65 to 69 dB(A) DNL, 2) 70 to 74 dB(A) DNL, 3) 75 to 79 dB(A) DNL, and 4) 80 dB(A) DNL or more

(DoD 1977 and USAF 1998). Within these bands of noise exposure, certain land uses are considered acceptable or unacceptable. For example, residential uses are normally not considered compatible with a predicted noise exposure in excess of 65 dB(A) DNL and an office use is not considered compatible in an area having a predicted noise exposure greater than 80 dB(A) DNL (FICUN 1980).

Specific noise exposure contours are developed for each Air Force installation that has flying activities; these contours are released to the surrounding jurisdictions to guide their land use planning or are used to guide facilities planning on Air Force bases. Areas below the 65-dB(A) DNL are typically categorized as compatible for residential use. The Air Force's policy has been to implement, if feasible, noise level reduction (NLR) measures for on-base residential and public use buildings with all new buildings being designed and constructed to comply with the appropriate NLR standards (USAF 1978).

Apart from noise associated with the operation of aircraft, federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. Occupational safety and health regulations are a primary method of enforcing these guidelines and standards.

Hearing Loss. The potential for permanent hearing loss arises from direct exposure to noise on a regular, continuing long-term basis (16 hours a day for 40 years) to levels above 75 dB(A) DNL. Based on an USEPA report (USEPA 1974), hearing loss is not expected in people exposed to 75 dB(A) DNL or less. The Federal Interagency Committee on Urban Noise states that hearing loss due to noise: 1) may begin to occur in people exposed to long-term noise at or above 75 dB(A) DNL, 2) would not likely occur in people exposed to noise between 70 and 75 dB(A) DNL, and 3) would not occur in people exposed to noise less than 70 dB(A) DNL (FICUN 1980).

Noise Interference. Elevated noise levels can potentially interfere with speech, cause annoyance, or disturb sleep. Annoyance resulting from noise exposure is typically measured via community surveys where the level of tolerance can vary greatly among individuals (USEPA 1974). It is estimated that 13.5 percent of the population exposed to 65 dB(A) DNL would be highly annoyed, while 37 percent would be highly annoyed if exposed to a 75 dB(A) DNL (USEPA 1974). Research also indicates that the "type of neighborhood" a person inhabits influences their noise annoyance level, with instances of noise complaints being greater for those living in rural areas than in suburban or urban residential areas (Schomer 2001).

Interior noise levels are typically lower than exterior levels due to the attenuation of the sound energy by the structure, with the amount of noise level reduction provided by a building depending on the type of construction and the number of openings such as doors, windows, chimneys, and plumbing vents. The approximate reduction in interior noise is 15 dB(A) when windows are open and 25 dB(A) for closed windows (USEPA 1974).

Region of Influence. The region of influence for a noise assessment is a function of the type of action proposed. For the Proposed Action and its alternatives, the region of influence would be primarily the military installation itself and an area extending approximately five to seven miles into the surrounding jurisdictions of the City of Del Rio and the county of Val Verde, Texas.

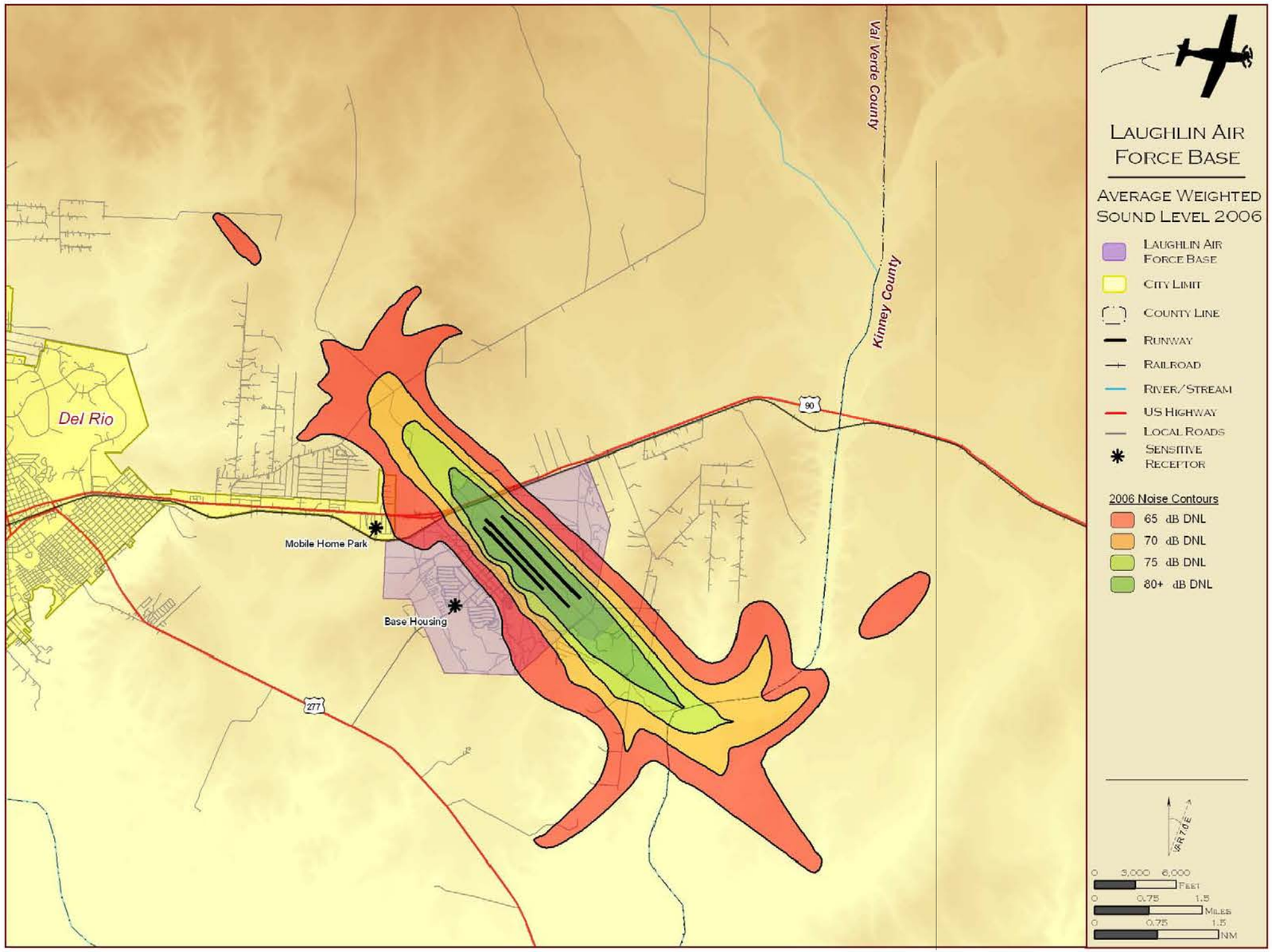
3.3.2.2 Affected Environment

The noise environment at Laughlin AFB primarily consists of noise created from aircraft operations. This noise setting was described in detail in the installation's December 2000 AICUZ report (USAF 2000b). In preparation for this document, the aircraft operations data were updated and modeled in 2006. Other sources of noise include vehicle noise, routine operation of equipment and machinery (e.g., generators; Heating, Ventilation, and Air Conditioning [HVAC]), and operation of construction equipment. The effects associated with the presence of noise at Laughlin AFB were examined in light of their effects on land use compatibility and human health and safety.

Aircraft Noise. The bulk of aircraft operations at Laughlin AFB are conducted by the 47th FTW, the installation host unit. The Air Force has extensively studied the aircraft noise environment at Laughlin AFB, preparing an analysis in 2000 and updating it in 2006. The 2006 updated data details the mix of aircraft types and operations conducted at Laughlin AFB during an average busy day. Training flights in jet engine trainers (T-1A Jayhawk, T-38C Talon) and turbo-propeller trainers (T-6A Texan II) account for the based aircraft operations. In addition, a small number of transient aircraft stationed elsewhere use the airfield; however, these aircraft comprise less than one percent of all operations. The 2006 data update, presented in Table 2-2, indicates that the average annual operations count of all aircraft at Laughlin AFB is just under 505,000 (USAF 2006c).

The resultant predicted noise exposure of 505,000 annual aircraft operations for the mix of aircraft found at Laughlin AFB is shown as a set of noise contours that are centered about the runways. Figure 3-3 depicts the baseline noise exposure in the general vicinity of Laughlin AFB. Table 3-3 details the acreage lying within each noise contour.

Figure 3-3 Baseline Noise Exposure from Aircraft Operations in Vicinity of Laughlin AFB



Source: USAF 2006c

(no document text this page)

Table 3-3 Land Area Exposed to Baseline Noise Levels

Noise Level dB(A) DNL	Baseline: Land Area (Acres)
65 to 69	5,711.35
70 to 74	2,362.06
75 to 80	1,173.40
>80	1,344.20
Total	**10,591.01**

Notes:
dB(A) = "A-weighted" decibel
DNL = Day-Night Average Sound Level

Construction Noise. Noise associated with the operation of machinery on construction sites is typically short-term, intermittent, and highly localized. The loudest machinery generally produces peak SPLs ranging from 86 to 95 dB(A) at 50 feet from the source (Table 3-4). For every multiple of this distance, SPL decreases by six dB(A). It is important to note that the peak SPL range for construction equipment noise does not take into account the ability of sound to be reflected or absorbed by nearby objects, which would further reduce noise levels. Additionally, interior noise levels would be reduced by 18 to 27 dB(A) due to the NLR properties of the building's construction materials (FAA 1992).

Table 3-4 Peak Sound Pressure Level of Heavy Equipment from a Distance of 50 Feet

Equipment	Noise Generated[a]
Bulldozer	95 dB(A)
Scraper	94 dB(A)
Front Loader	94 dB(A)
Backhoe	92 dB(A)
Grader	91 dB(A)
Crane	86 dB(A)

Source: Reagan and Grant 1977
Notes:
dB(A) = A-weighted decibel
[a] Noise from a single source

The dB(A) DNL that would result from operating construction equipment is a function of the frequency, duration, and time of day during which the activity occurs. For example, a bulldozer that generates 95 dB(A) at 50 feet and is operating continuously for 365 days from 0600 hours to 2200 hours for an entire year would be operating during all 15 "day" hours and one "night" hour of the DNL metric. Absent other sources of noise (e.g., aircraft operations), such operation would create a predicted noise exposure of 64 dB(A) DNL.

3.3.3 Land Use

3.3.3.1 Definition of Resource

Land use describes the activities that take place in a particular area and generally refers to human modification of land, often for residential or economic purposes. It also refers to use of land for

preservation or protection of natural resources. It is important as a means to determine if there is sufficient area for proposed activities and to identify any potential conflicts with local land use plans. This section of the EA describes the on-base and off-base land use resources that could potentially be affected by the IFF mission beddown and implementation of construction projects noted in the General Plan.

3.3.3.2 Region of Influence

The ROI consists of Laughlin AFB and vicinity. Off-base resources consist of land immediately adjacent to Laughlin AFB and include areas belonging to the City of Del Rio and Val Verde County. The ROI also includes the land under the airspace where the T-6A Texan II and T-38C Talon would be flown, the Laughlin 1, 2 and 3 MOAs.

3.3.3.3 Laughlin AFB and Vicinity

Laughlin AFB is located on 4,524 acres in Val Verde County within the Rio Grande River Valley Region of southwest Texas. Laughlin AFB sits adjacent to the south side of United States Highway 90 (US Hwy 90), about 150 miles west of San Antonio, the closest metropolitan center. Laughlin AFB's location offers student pilots wide open spaces and large unconstrained airspace. This, combined with excellent weather in the region, provides an outstanding location to conduct aircraft training operations.

AICUZ Program

The Air Force provides land use recommendations to local jurisdictions through the AICUZ program. The purpose of the program is to promote compatible land use development in areas subject to aircraft noise and accident potential. These guidelines have been established on the basis of studies prepared and sponsored by several federal agencies, including the DoD. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties.

The AICUZ study is updated periodically per AFI 32-7063, *Air Installation Compatible Use Zone Program*. According to the last published AICUZ study for Laughlin AFB, there are very few encroachments from incompatible uses in the vicinity of Laughlin AFB (USAF 2000). Noise contours from aircraft operations extend parallel and from the ends of the runways over largely agricultural and open lands. See Figure 3-3 for a graphical representation of the noise contours for Laughlin AFB. The majority of the off-base land under the noise contours is undeveloped and is expected to remain as open space or in the domain of the federal government. All of the clear zones for Laughlin AFB overlie government property. Accident Potential Zones (APZs) I and II extend off base to northwest and southeast. The specific noise exposure levels from aircraft operations in the vicinity of Laughlin AFB were most recently released to local governments for their use in planning documents with the release of the Laughlin AICUZ study in 2000 (USAF 2000b). The AICUZ study also provided the local governments with the information necessary to determine which safety areas and obstacle evaluation areas surround Laughlin AFB. Specific information on the noise environment around Laughlin AFB may be found in Section 3.3.2, Noise. As noted in Section 3.3.2.2 (Noise), the flying operations data were updated for this assessment. Upon the completion of the Proposed

Action, a validation of flight operations with actual operational data would occur and a new set of contours would be released to the community along with a detailed analysis of land use compatibility.

Laughlin AFB

In 2006, Laughlin AFB updated its General Plan, including its land use and capital improvement recommendations. In doing so, the base inventoried existing land uses and noted linkages between land use classifications and also noted potential conflicting land uses. Approximately half the installation is devoted to airfield or airfield operations uses (Table 3-5).

Table 3-5 Laughlin Land Use Classifications

Land Use Category	Percent of Total Base Land	Typical Facilities and Features
Airfield	52.4%	Aircraft operating areas, runways, taxiways, aircraft parking aprons
Aircraft Operations and Maintenance	1.4%	Aircraft operations and maintenance, hangars, shops, docks, control tower, fire station
Industrial	4.6%	Base engineering, maintenance shops, storage, warehousing, utilities, fuels, fire training facilities
Administrative	0.5%	Headquarters, civilian personnel, law center, security operations, education center, flight training
Community Commercial	1.1%	Commissary, exchange, club, dining hall, recreation center, gym, bank
Community Service	0.3%	Post office, library, chapel, child development center
Medical	0.3%	Clinic, medical storage
Accompanied Housing	4.1%	Family housing
Unaccompanied Housing	0.9%	Housing for single personnel, visitor housing
Outdoor Recreation	5.3%	Outdoor courts and fields, swimming pool, golf course
Open Space	29.1%	Conservation area, buffer space

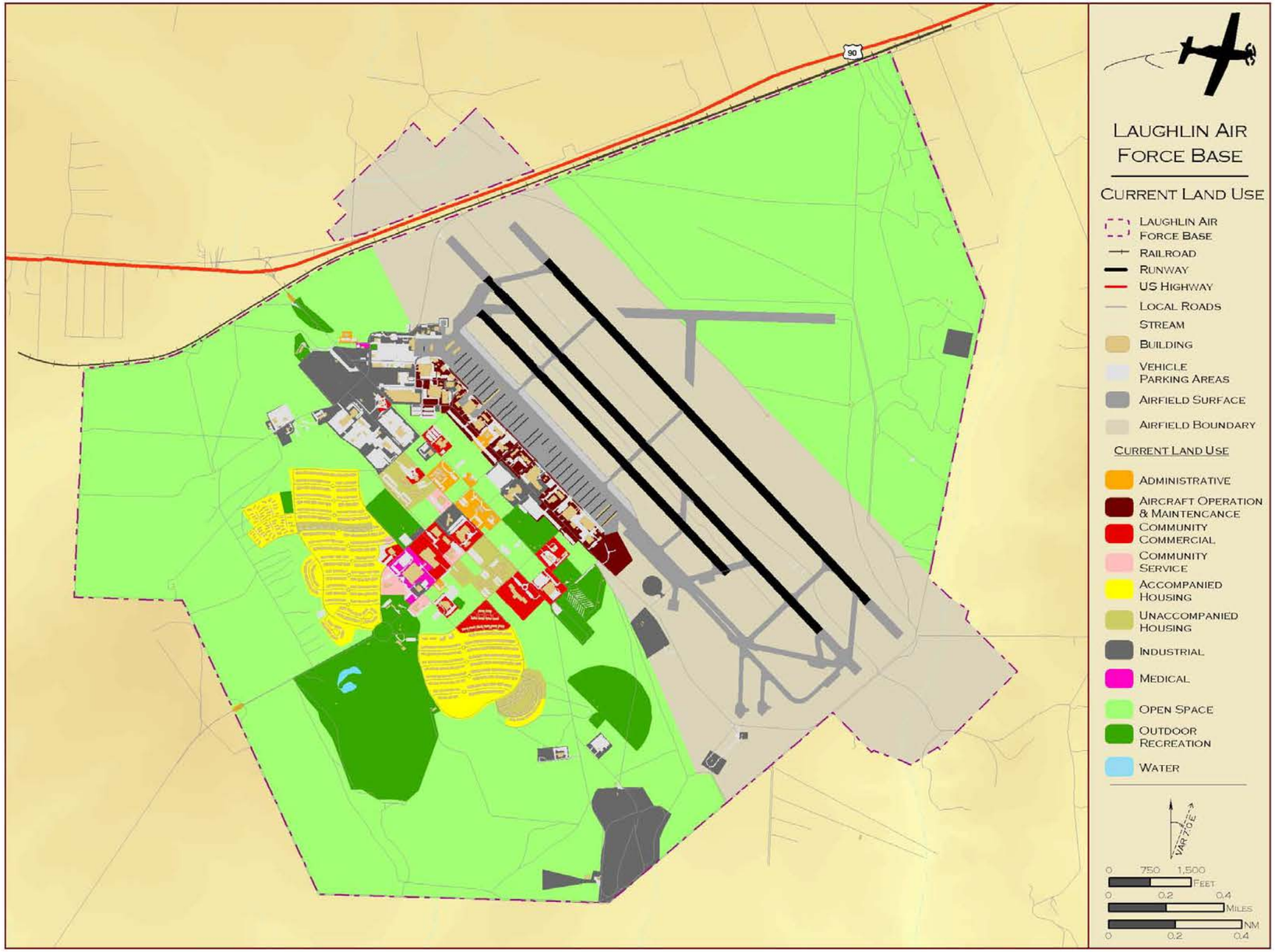
Source: USAF 2006b
Notes:
% = percent

Land use patterns at Laughlin AFB are shown in Figure 3-4 and the relationship of land use classifications is shown in Figure 3-5.

Although the runway complex divides the base lands nearly in half, the eastern half is virtually undeveloped. The western side of the base contains the operations area, maintenance facilities, housing, administration, and recreation areas. Outdoor recreation, community commercial and open space act as a buffer between the airfield/aircraft operations and maintenance uses and the residential areas of the installation. Military family housing is located on the western side of the base (USAF 2006b).

(no document text this page)

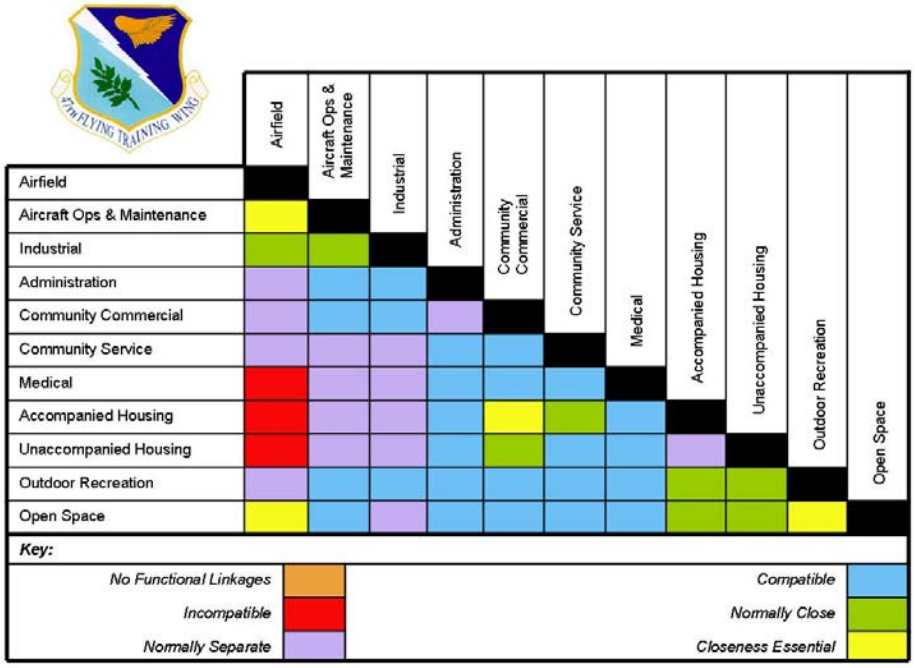
Figure 3-4 Current Land Use



Source: USAF 2006b

(no document text this page)

Figure 3-5 Land Use Relationships



Source: USAF 2006b

3.3.4 Air Quality

3.3.4.1 Air Quality Standards and Regulations

The USEPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) under the *Clean Air Act Amendments of 1990* (CAAA). The CAAA also set emission limits for certain air pollutants from specific sources, set new source performance standards based on best demonstrated technologies, and established national emission standards for hazardous air pollutants.

The CAAA specifies two sets of standards—primary and secondary—for each regulated air pollutant. Primary standards define levels of air quality necessary to protect public health, including the health of sensitive populations such as people with asthma, children, and the elderly. Secondary standards define levels of air quality necessary to protect against decreased visibility and damage to animals, crops, vegetation, and buildings. Federal air quality standards are currently established for six pollutants (known as criteria pollutants), including carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), sulfur oxides (SO_x, commonly measured as sulfur dioxide [SO_2]), lead, and particulate matter (equal to or less than 10 micrometers in aerodynamic diameter (PM_{10}) and equal to or less than 2.5 micrometers in aerodynamic diameter [$PM_{2.5}$]). Although O_3 is considered a criteria pollutant and is measurable in the atmosphere, it is often not considered as a pollutant when reporting emissions from specific sources. O_3 is not typically emitted directly from most emissions sources; rather, it is formed in the atmosphere

from its precursors (NO_x and volatile organic compounds [VOCs]) that are directly emitted from various sources. Thus, emissions of NO_x and VOCs are commonly reported instead of O_3.

The NAAQS for the six criteria pollutants are shown in Table 3-6. Units of measure for the standards shown in this table are micrograms per cubic meter of air ($\mu g/m^3$), except for ozone, which is in parts per million (ppm).

The USEPA classifies the air quality within an Air Quality Control Region (AQCR) according to whether the region meets federal primary and secondary air quality standards. An AQCR or portion of an AQCR may be classified as attainment, nonattainment, or unclassified with regard to the air quality standards for each of the criteria pollutants. "Attainment" describes a condition in which standards for one or more of the six pollutants are being met in an area. The area is considered an attainment area for only those criteria pollutants for which the NAAQS are being met. "Nonattainment" describes a condition in which standards for one or more of the six pollutants are not being met in an area. "Unclassified" indicates that air quality in the area cannot be classified and the area is treated as attainment. An area may have all three classifications for different criteria pollutants.

Table 3-6 National Ambient Air Quality Standards

Pollutant	Standard Value ($\mu g/m^3$)[a]	Standard Type
CO		
1-hr average	40,000	Primary
8-hr average	10,000	Primary
NO_x		
Annual average	100	Primary and secondary
O_3		
1-hr average[b]	0.12	Primary and secondary
8-hr average[c]	0.08	Primary
Lead		
Quarterly average	1.5	Primary
PM_{10}		
24-hr average[d]	150	Primary and secondary
Annual average[e]	50	Primary and secondary
$PM_{2.5}$		
24-hr average[f]	65	Primary
Annual average[g]	15	Primary
SO_2		
3-hr average	1,300	Secondary
24-hr average	365	Primary
Annual average	80	Primary

Notes:
CO = carbon monoxide NO_x = nitrogen oxides O_3 = ozone
SO_2 = sulfur dioxide $\mu g/m^3$ = micrograms per cubic meter
hr = hour
$PM_{2.5}$ = particulate matter equal to or less than 2.5 micrometers in aerodynamic diameter
PM_{10} = particulate matter equal to or less than 10 micrometers in aerodynamic diameter
[a] Units for ozone are parts per million (ppm).
[b] The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
[c] To attain the 8-hour ozone standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[d] The 24-hour standard for PM_{10} is not to be exceeded more than once per year.
[e] To attain the annual PM_{10} standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 $\mu g/m^3$.
[f] The $PM_{2.5}$ 24-hour standard is based on the 3-year average 98th percentile of 24-hour concentrations at each population-oriented monitor.
[g] The $PM_{2.5}$ annual standard is based on 3-year average of annual arithmetic means.

The CAAA requires federal actions to conform to any applicable state implementation plan (SIP). The USEPA has promulgated regulations implementing this requirement (USEPA 2003a and USEPA 2003b). A SIP must be developed to achieve the NAAQS in nonattainment areas (i.e., areas not currently attaining the NAAQS for any pollutant) or to maintain attainment of the NAAQS in maintenance areas (i.e., areas that were nonattainment areas but are currently attaining that NAAQS). General conformity refers to federal actions other than those conducted according to specified transportation plans (which are subject to the Transportation Conformity Rule). Therefore, the General Conformity Rule applies only to nontransportation actions in nonattainment or maintenance areas. Such actions must perform a determination of conformity

with the SIP if the emissions resulting from the action exceed applicability thresholds specified for each pollutant and classification of nonattainment.

Air quality management at Air Force installations is established in AFI 32-7040, *Air Quality Compliance*. AFI 32-7040 requires installations to achieve and maintain compliance with all applicable federal, state, and local standards. Air quality compliance involves prevention, control, abatement, documentation, and reporting of air pollution from stationary sources and mobile sources, if located in nonattainment areas. Maintaining compliance with air quality regulations may require reduction or elimination of pollutant emissions from existing sources and control of new pollution sources.

3.3.4.2 Regional Air Quality

Laughlin AFB is located in Val Verde County and is within the Metropolitan San Antonio Interstate AQCR 217. AQCR 217 consists of the counties of Atascosa, Bandera, Bexar, Comal, Dimmitt, Edwards, Frio, Gillespie, Gonzales, Guadalupe, Karnes, Kendall, Kerr, Kimble, Kinney, La Salle, Mason, Maverick, Medina, Real, Uvalde, Val Verde, Wilson, and Zavala. Bexar, Comal, and Guadalupe Counties are designated as basic nonattainment areas for ozone with a deferred nonattainment date under an Early Action Compact (EAC) for those three counties.

Val Verde County is currently classified as attainment for all criteria pollutants under the NAAQS (USAF 2005b). Laughlin AFB, considered to be a synthetic minor emission source, has one minor source operating permit for a corrosion control facility and maintains permits by rule for their remaining stationary emission sources. Table 3-7 compares the 2004 actual and permitted emissions for Laughlin AFB with the 2001 Val Verde County emissions inventory. Val Verde County emissions include emissions from point, area, non-road mobile, and on-road mobile sources. Laughlin AFB emissions include stationary sources such as boilers, generators, surface coatings, paint booths, storage tanks, and fueling operations, among others. Mobile and biogenic source emission inventories have not been determined for Laughlin AFB.

Table 3-7 Val Verde County Emissions and Laughlin AFB Actual and Permitted Emissions

	Annual Emissions (tpy)					
	CO	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$[d]**
2001 Val Verde County Emissions Inventory[a]	14,146	2,726	1,905	152	3,649	912
2004 Laughlin AFB Actual Emissions[b,d]	23.7	14.2	9.2	4.5	4.4	4.4
Laughlin AFB Permitted Emissions[c,d]	99.5	94	45	10	23.6	23.6

Notes:
AFB = Air Force Base CO = carbon monoxide NO_X = nitrogen oxides
SO_2 = sulfur dioxide tpy = tons per year VOC = volatile organic compound
$PM_{2.5}$= particulate matter equal to or less than 2.5 micrometers in aerodynamic diameter
PM_{10} = particulate matter equal to or less than 10 micrometers in aerodynamic diameter
[a] Includes emissions from point, area, on-road, nonroad mobile sources, and biogenic sources for Val Verde County. Source: AIRData; AIRData Information comes from an extract of USEPA's National Emission Inventory (NEI) database. 2001 is the most current AIRData report available.
[b] 2004 actual emissions were obtained from 2004 Air Emission Inventory for Laughlin AFB (USAF 2004a). Emissions from mobile and biogenic sources not included.
[c] Source: USAF 2005b
[d] $PM_{2.5}$ emissions assumed = PM_{10} emissions.

3.3.5 Earth Resources

3.3.5.1 Definition of the Resource

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), topography, and soil stability.

Seismic properties indicate the potential for earthquake activity in an area. Those regions of the country that have subsurface shifting, faulting, or crustal disturbance are more likely to be affected by earthquake activity.

Topography is defined as the relative positions and elevations of the natural or human-made features of an area that describe the configuration of its surface. An area's topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information about an area's topography typically encompasses surface elevations, slope, and physiographic features (i.e., mountains, ravines, or depressions).

The term "soil" generally refers to unconsolidated materials lying over bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support man-made structures and facilities. Soils typically are described in terms of their series

or association, slope, physical characteristics, and relative compatibility or constraints with respect to particular construction activities and types of land use.

3.3.5.2 Geology

Laughlin AFB lies within the Great Plains Physiographic Province at the junction of the Edwards Plateau and the Rio Grande Plain ecological regions. The approximate divide for these two ecological regions is US Hwy 90. Running generally north of a line formed by US Hwy 90, the Edwards Plateau region is locally characterized by high dry limestone ridges, scrub brush, and poor surface soils. South of US Hwy 90, the Rio Grande Plains generally has gently rolling plains and somewhat deeper and richer soils. Laughlin AFB lies predominantly in the Rio Grande Plain. The base lies near the edge of the Balcones Fault Zone, but there are no active faults or seismic activity in the immediate area. The underlying geology is limestone of the Georgetown formation, which is a basal member of the Washita Group, Cretaceous in age. Depth to bedrock generally varies from zero to 20 feet. (USAF 2006b).

Minerals with significant deposits in Val Verde County include oil, natural gas, and manganese. The oil in the area is asphaltic and is generally not economical to drill. There are some small natural gas deposits being tapped in the northwest part of the county. Manganese was mined near the town of Shumla during World War I but the quality of the ore was not sufficient to allow economical operation of the mines after the war ended. Shumla is approximately 56 miles northeast of Laughlin AFB. No active pits, quarries, mines, or oil or gas wells are known to exist at Laughlin AFB (USAF 2005c).

3.3.5.3 Topography

Most of Val Verde County lies within the Edwards Plateau ecological region, which is a Texas subdivision of the Great Plains physiographic province. The topography of this province is typified by rough and rolling terrain. The extreme southeastern part of the county, in the vicinity of Del Rio, is located in Rio Grande Plain ecological region. The topography of this province is characteristically flat to gently rolling with elevations within the installation boundaries ranging from a low of 1,038 feet above msl in the east and southeast portion of Laughlin AFB, to a high point of 1,130 feet above msl near the northwest corner of the installation. The airfield and the central portion of Laughlin AFB are generally flat, partially a result of construction grading. The western and northwestern portions of Laughlin AFB are gently rolling and exhibit slightly more topographic relief (USAF 2006a).

3.3.5.4 Soils

The predominate soil type on Laughlin AFB is the Zapata-Vinegarroon complex. Typically, the Zapata soil has a surface layer about eight inches thick of moderately alkaline, light brownish gray clay loam that contains a few caliche fragments. The next five inches is strongly cemented caliche that is laminar in the upper part. Weakly cemented caliche is at a depth of 13 inches. Vinegarroon soil has a surface layer of moderately alkaline, light brownish gray gravelly loam about seven inches thick. The subsoil is moderately alkaline, pale brown gravelly clay loam about ten inches thick. The next seven inches is indurated caliche. Weakly cemented caliche is at depth of 24 inches (USDA 1982). The Zapata-Vinegarroon is characterized by very shallow,

gently sloping soils on upland areas. These soils formed in old outwash sediment over thick beds of caliche. As much as 20 percent of the surface is covered by limestone and caliche fragments. These soils are well drained and experience medium surface runoff. Permeability is moderate, and available water capacity is very low. There are lesser areas of Acuna silty clay. This soil type is found in stream terraces and streambeds (USAF 2005c).

3.3.6 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats in which they occur. The natural resources at Laughlin AFB are managed under an Integrated Natural Resources Management Plan (INRMP) (USAF 2005c). For the purposes of this analysis, biological resources are divided into the categories of vegetative communities; wildlife including mammals and bird species; and threatened, endangered, or state listed species of concern.

The United States Fish and Wildlife Service (USFWS) is responsible for the recovery of federally listed threatened and endangered species under the *Endangered Species Act of 1973*. The Texas Parks and Wildlife Department (TPWD) provides management for wildlife at the state level.

3.3.6.1 Vegetation

Val Verde County lies within the western portion of the Edwards Plateau eco-region of Texas. The Balcones Escarpment forms a distinct boundary of the Plateau on its eastern and southern borders and outlines what is known as the Texas Hill Country (TPWD 2005). The eastern and southern halves of the Plateau consist of dense growth of shrubs and small trees, mostly oaks (*Quercus fusiformis* and other species) and juniper (*Juniperus ashei*). Within the northwestern margin the vegetation grades into a short tobosa grass (*Hilaria mutica*) savanna with mesquite (*Prosopis glandulosa*) (Johnston 2006).

Vegetation found on Laughlin AFB is consistent to that within the eco-region described above. Vegetation communities are described in terms of a "series" which identifies one or more dominant plant. A biological survey of the base found four distinct vegetation areas: Cane Bluestem-False Rhodesgrass Series, Cenizo Series-Guajillo Series mosaic, the Sugarberry-Elm series, and the Big Sacaton Series (TPWD 1995).

Degraded remnants of the Cane Bluestem-False Rhodesgrass Series are found in the level uplands on the east side of the base as well as some scattered patches. These sites are heavily mowed to prevent shrub invasion. These grasslands have been heavily invaded by or planted with grasses such as Bermuda (*Cynodon dactylon*), King Ranch bluestem (*Bothriochloa ischaemum* var. *songarica*), and St. Augustine (*Stenotaphrum secundatum*) (TPWD 1995).

Cenizo Series-Guajillo Series mosaic covers the hills of the western half, and eastern edge of the base. Heavy grazing and the suppression of fires have resulted in the proliferation of woody species such as cenizo (*Leucophyllum frutescens*), guajillo (*Acacia berlandieri*), and numerous other species in this habitat (TPWD 1995).

The Sugarberry-Elm Series occupies relatively level to gently sloping terrain. The overstory is dominated by trees such as sugarberry (*Celtis laevigata*), cedar elm (*Ulmus crassifolia*), netleaf hackberry (*Celtis reticulata*), black willow (*Salix nigra*), and Berlandier ash (*Fraxinus berlandieri*). The herbaceous ground cover consists of various grasses and forbs (TPWD 1995).

The Big Sacaton Series occupies relatively level, seasonally wet bottomlands adjacent to Sacatosa Creek. Ground cover consists of spikesedge (*Eleocharis* sp.) and Aparejo muhly (*Muhlenbergia utilis*) covered by a taller layer of Lindheimer muhly (*Muhlenbergia lindheimeri*), big alkali sacaton (*Sporobolus wrightii*), and switchgrass (*Panicum virgatum*) (TPWD 1995).

3.3.6.2 Wildlife

Wildlife at Laughlin AFB is consistent with those expected to occur in the scrub-shrub and grassland vegetative communities described above. Common species observed on the installation include Desert Cottontail (*Sylvilagus audobonii*), Black-tailed Jack Rabbit (*Lepus californicus*), Mexican Ground Squirrel (*Spermophilus mexicanus*), Turkey Vulture (*Cathartes aura*), Red-tailed Hawk (*Buteo jamaicensis*), Rock Dove (*Columba livia*), Mourning Dove (*Zenaida macroura*), Chihuahuan Raven (*Corvus cryptoleucus*), and Cactus Wren (*Campylohychus brunneicapillus*).

3.3.6.3 Rare, Threatened and Endangered Species

Val Verde County has four federally threatened or endangered birds, one fish, one clam, and two flowering plant species (Table 3-8). A biological survey of Laughlin AFB (TPWD 1995) did not find any of these species, however, two rare plant species, longstalk heimia (*Heimia longipes*) and Texas trumpet (*Acleisanthes crassifolia*) were found on the installation. Longstalk heimia is known to occur in five locations on Laughlin AFB, in the floodplain areas along Sacatosa Creek on the eastern edge of the base and in the floodplain of the unnamed southwest drainage along the southern perimeter road west of the sewage ponds (USAF 2005c). A small population of Texas trumpets was found in a shrubland on a gravelly slope in the northwest quarter of the installation near the western perimeter fence (USAF 2005c).

Table 3-8 Federally Threatened or Endangered Species in Val Verde County

Common Name	Scientific Name	Species Group	Federal Status
Bald eagle	*Haliaeetus leucocephalus*	Birds	Threatened
Black-capped vireo	*Vireo atricapilla*	Birds	Endangered
Brown pelican	*Pelecanus occidentalis*	Birds	Endangered
Least tern	*Sterna antillarum*	Birds	Endangered
Devils River minnow	*Dionda diaboli*	Fishes	Threatened
Texas hornshell (mussell)	*Popenaias popeii*	Clams	Candidate
Texas snowbells	*Styrax texanus*	Flowering Plants	Endangered
Tobusch fishhook cactus	*Ancistrocactus tobuschii*	Flowering Plants	Endangered

Source: USFWS 2006

3.3.6.4 Wetlands

EO 11990, *Protection of Wetlands*, May 24, 1977, directs federal agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are directed to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. The CWA sets the basic regulatory framework for regulating discharges of pollutants to US waters. Section 404 of the CWA establishes a federal program to regulate the discharge of dredged and fill material into waters of the US, including wetlands. Four federal agencies are responsible for identifying and regulating wetlands: the United States Army Corps of Engineers (USACE), USEPA, USFWS, and Natural Resources Conservation Service (NRCS). The USACE and USEPA are primarily responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA. The USACE also makes jurisdictional determinations under Section 10 of the *Rivers and Harbors Act of 1899*. The NRCS has developed procedures for identifying wetlands for compliance with the *Flood Security Act of 1985* and the USFWS has developed a classification system for identifying wetlands.

No formal wetland delineation project has been conducted at Laughlin AFB. However, previous studies have identified areas with potential wetlands. These areas are generally located in undeveloped areas along the eastern perimeter and far northwest corner of the installation. (USAF 2005c).

3.3.7 Cultural Resources

3.3.7.1 Regulations and Criteria

Cultural resources are prehistoric and historic sites, districts, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. A historic district is an area that "possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (NPS 1997).

Numerous laws and regulations require that possible effects on cultural resources be considered during the planning and execution of federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the federal agency proposing the actions, and prescribe the relationships among involved agencies. In addition to NEPA, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act (NHPA) (especially Sections 106 and 110), the Archaeological Resources Protection Act (ARPA), the American Indian Religious Freedom Act (AIRFA), and the Native American Graves Protection and Repatriation Act (NAGPRA). Under AIRFA, Laughlin AFB has no known traditional cultural or ceremonial sites to which the base must provide access.

Section 106 of NHPA requires that federal agencies give the Advisory Council on Historic Preservation, State Historical Preservation Officer, and other interested parties a "reasonable opportunity to comment" on proposed actions. Federal agencies must consider whether their activities could affect historic properties that are already listed, determined eligible, or not yet evaluated under the National Register of Historic Places (NRHP) criteria. Properties that are either listed on or eligible for listing in the NRHP are provided the same measure of protection under Section 106.

The following criteria have been established as guidance for evaluating potential entries to the NRHP. "Significance" in American history, architecture, archeology, and culture is granted to districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that meet at least one of the following criteria:

- an association with events that have made a significant contribution to the broad patterns of history (Criterion A);
- an association with the lives of persons significant in history (Criterion B);
- embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or represent a significant and distinguished entity whose components may lack individual distinction (Criterion C); or
- have yielded, or may likely yield, information important in prehistory or history (Criterion D).

Resources less than 50 years of age must be evaluated under Criterion Consideration G: Properties That Have Achieved Significance in the Last Fifty Years. This criterion requires that such resources be "exceptionally important" to qualify for listing. Resources less than 50 years of age must also meet the criteria for resources 50 years or older (i.e., A, B, C, or D) and retain their integrity.

3.3.7.2 Historic Resources

3.3.7.2.1 Previous Investigations

Four architectural investigations (DeVore 1993; Greene 1996; Spude 1996; and Salo et al. 2002) have been conducted for Laughlin AFB. The first investigation by DeVore identified three

potentially eligible resources—Facility No. 302, a storage facility; Structure No. 106, a storage reservoir; and Structure No. 2410, a boundary fence (DeVore 1993). The investigation recommended that further studies be conducted to determine the NRHP eligibility of these facilities and other World War II and Cold War-era resources. Subsequent studies found none to be eligible for listing in the NRHP. Following DeVore's recommendation, a historic buildings inventory (Greene 1996) and an evaluation of World War II and Cold War-era facilities by Spude were conducted (USAF 2004b). The historic buildings inventory included photographs and brief descriptions, but did not make NRHP recommendations. Spude's investigation of one remaining World War II facility (No. 302) and Cold War-era resources found none to be eligible (USAF 2004b).

In 2000, AETC sponsored an inventory and evaluation of Cold War-era resources to confirm earlier recommendations (Salo et al. 2002). A total of 163 resources was identified after infrastructural elements were removed. The majority of the 163 resources were related to housing, administrative, or support needs, and thus, were not directly related to a Cold War mission. As a result, those resources less than 50 years of age did not meet the requirements for exceptional significance under Criterion Consideration G, and those over 50 years of age were not historically or architecturally significant, thus, did not meet the requirements of Criteria A, B, C, or D. Seven resources, less than 50 years of age, had a direct Cold War mission, but upon further examination, it was concluded that these resources were not exceptionally important, and thus did not meet the requirements of Criterion Consideration G; several had also lost their integrity (Salo et al. 2002).

3.3.7.2.2 Historic Properties

None of the buildings scheduled for demolition or alterations at Laughlin AFB are NRHP-eligible. Buildings 52 (Non-Destructive Inspection Shop), 53 (Fuels System Maintenance Facility), 201 (Egress Shop), 241 (Data Processing Installation), 255 (Airman Permanent Party/Permanent Change of Station [PCS] Student Dormitory), 256 (Airman Permanent Party/PCS Student Dormitory), 320 (Student Training Complex), 328 (Simulator Facility), 380 (Physiological Training), 390 (Youth Center), 413 (Flight Line Shack), 460 (Transient Lodging Facility), 461 (Transient Lodging Facility), 462 (Transient Lodging Facility), 463 (Transient Lodging Facility), 476 (Child Development Center), 494 (Golf Clubhouse/Equipment), and 950 (Munitions Cube) were evaluated in 2002 under Criterion Consideration G for properties under 50 years of age and recommended not eligible for listing in the NRHP due to lack of exceptional significance (Salo et al. 2002). Since they remain under 50 years of age at this time, no further evaluation is necessary.

Buildings 210 (Hangar 2), 284 (Noncommissioned Officer Open Mess), 339 (Communications Facility), 348 (Communications Facility), 351 (Base Theater), and 472 (Officers Open Mess) were all constructed in the early 1950s. At the time of the Cold War evaluation, they were not yet 50 years of age, and were evaluated under the stricter criterion for properties less than 50 years of age (Criterion Consideration G). None of the buildings were determined to be of exceptional significance, and thus, were not recommended eligible for listing in the NRHP. These buildings are now over 50 years of age, and thus, qualify for evaluation under the standard NRHP Criteria A, B, C, or D. All six buildings are routine support facilities built in the Military

Vernacular style. This architectural style typically lacks architectural detail, is minimalist, and functional in nature. As routine support facilities, these buildings are not associated with historically significant events or persons, nor are they directly related to any major mission at Laughlin AFB; therefore, they do not meet the requirements of Criteria A or B. They also do not exhibit significant architectural or engineering features. Thus, they do not meet the requirements of Criterion C, and are unlikely to yield important information about prehistory or history (Criterion D). Furthermore, several buildings no longer retain their integrity. Alterations include the replacement of windows, infilling windows, applying brick veneer to exteriors, and adding corrugated metal friezes. Therefore, Buildings 210, 284, 339, 348, 351, and 472 are not recommended as eligible for listing in the NRHP.

Resources 280 and 282 are water storage tanks that were not evaluated during the previous Cold War investigation because they were support structures that did not reflect a direct Cold War mission (Salo et al. 2002). The water storage tank (Building 282), constructed in 1951, is over 50 years of age and is one of the oldest structures on-base. Water storage tank, Building 280, was constructed in 1964 and is less than 50 years of age. Both towers are circular in design. Building 280 is the larger of the two with a capacity for 300,000 gallons; Building 282 has a capacity for 100,000 gallons (Greene 1996:114 and 116). Neither storage tank is considered eligible for the NRHP, regardless of age. As a type, support structures such as these exist at Air Force bases throughout the US and neither has a significant or special association with any major mission at Laughlin AFB. Furthermore, when the cultural landscape is taken into consideration, Building 282 no longer retains its integrity. Constructed in 1951, the water tower, along with nearby buildings constructed during the same time period, reflected the styles, materials, and design of a 1950s military base. Alterations to nearby buildings such as Building 284 and the construction of a second water tower (Building 280) in the 1960s, have impacted the integrity of Building 282. The water tower and the surrounding area no longer retain the look, feel, or association of an early Cold War-era (i.e., 1950s) military cultural landscape.

Building 502 (Aircraft Weather Shelter) was constructed in 2005. As a resource under 50 years of age, and only recently constructed, it fails to meet the requirements for exceptional importance under Criterion Consideration G.

3.3.7.3 Archeological Resources

3.3.7.3.1 Previous Investigations

Two archeological investigations (DeVore 1993 and Tennis et al. 1996) have been previously conducted in relation to Laughlin AFB proper. The earliest investigations (DeVore 1993) on the main base, an auxiliary air field, and one small recreational facility resulted in the recording of three archeological sites (41VV1653, 41VV1654, and 41VV1655) and one isolated find (41VV1652).

In 1994, a survey (Tennis et al. 1996) examined 13 sites (11 prehistoric, 1 historic, and 1 multicomponent) located at Laughlin AFB. As a result of the survey, 11 sites were recommended as potentially eligible for inclusion in the NRHP. Of the 11 sites, determined as potentially eligible, only four (41VV1654, 41VV1688, 41VV1689, and 41VV1690) were actually determined eligible for inclusion in the NRHP, as a result of a subsequent 1998

evaluation (Dering 1998). Only one site, 41VV1684, was found in the upland zone of the base. It was determined ineligible for inclusion in the NRHP. The potential for archeological sites within the cantonment area is therefore very low.

3.3.8 Water Resources

3.3.8.1 Surface Water

Laughlin AFB is located within the Rio Grande Watershed which flows into the Rio Grande River and then discharges into the Gulf of Mexico. The total Rio Grande Watershed drainage area is 182,200 square miles and has the Pecos River, Devils River, Alamito Creek, and San Felipe Creek as its major tributaries within Texas (USGS 1995).

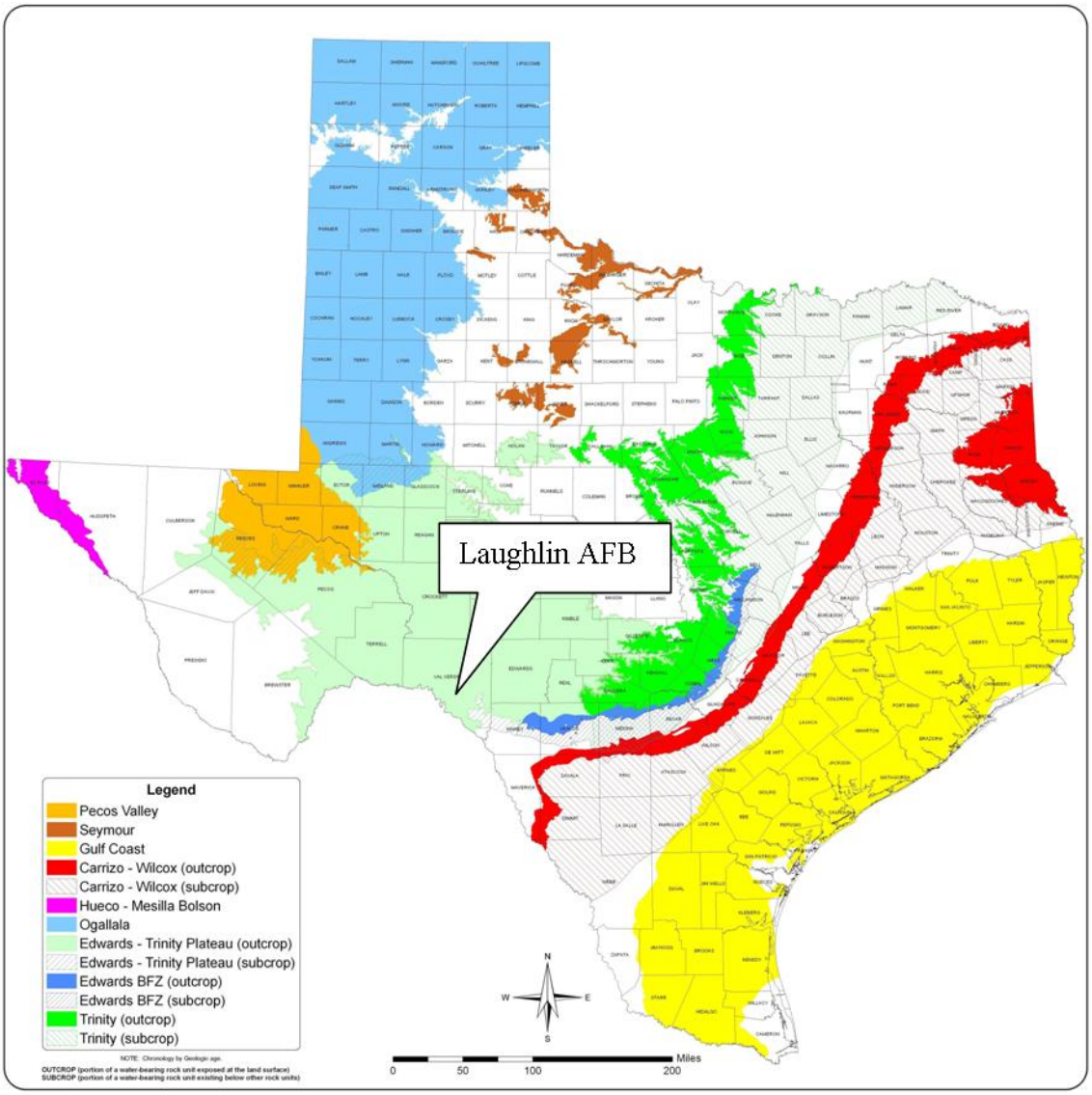
Laughlin AFB is comprised of four drainage areas. Two of the four areas have a relatively high percentage of impervious cover accounting for the majority of the installation runoff (USAF 2003a). These four drainage areas discharge to water bodies located within or adjacent to Laughlin AFB: Sacatosa Creek, Zorro Creek, two unnamed tributaries, and the golf course ponds. Sacatosa Creek originates approximately 7.5 miles north north-east of Laughlin AFB, and flows along the eastern portion of Laughlin AFB. Sacatosa Creek receives discharge from the unnamed tributary that flows through the base, eastern base overland flow, and from the treatment lagoons. Zorro Creek originates approximately 200 yards north north-west of Laughlin AFB, and flows along the western portion of the base, receiving discharges from the northwest area of the base. Both Sacatosa and Zorro Creeks discharge into the Rio Grande River (USGS 1985). The second unnamed tributary receives overland flow from the golf course, family housing, and discharge from the golf course ponds prior to flowing into the Rio Grande River (USAF 2006b).

Permitting for point and storm water discharges has been delegated to the State of Texas by the National Pollutant Discharge Elimination System (NPDES). Individual and general storm water permits require the permittee to develop and implement a pollution prevention plan to monitor discharges for specific pollutants. Laughlin AFB is an industrial facility and, as such, has obtained a TXR050000 Multi-Sector General Permit from the Texas Commission on Environmental Quality (TCEQ) (TCEQ 2006a). This permit (Number TXR05M844) allows Laughlin AFB to discharge storm water associated with industrial activities into receiving waters as designated in the Texas Surface Water Quality Standards. The permit requires monitoring of specific pollutants at outfalls, utilization of BMPs, and implementation of engineering controls to control runoff (USAF 2003a).

3.3.8.2 Groundwater

Laughlin AFB is located above the Edwards-Trinity Aquifer System. The Edwards-Trinity Aquifer System, shown in Figure 3-6, occupies an area of approximately 35,500 square miles in west-central Texas. The groundwater of the Edwards-Trinity Aquifer flows from the north to the south and southeast and typically includes a recharge and artesian zone. The aquifer is generally recharged by direct precipitation. Groundwater is located in both shallow unconfined and deeper confined units (USGS 1995).

Figure 3-6 Location of Edwards-Trinity Aquifer in Relation to Laughlin AFB



Source: TWDB 2006
Notes:
BFZ = Balcones Fault Zone

Groundwater is withdrawn from the Edwards-Trinity Aquifer from wells reaching depths of 150 to 300 feet below surface and the wells generally produce 50 to 200 gallons of water per minute. The groundwater withdrawn from this aquifer is primarily used for agricultural irrigation. The water obtained from the Edwards-Trinity Aquifer contains calcium bicarbonate and high concentration of dissolved solids, making the water a poor source for drinking water. The source of drinking water for the City of Del Rio and Laughlin AFB are the San Felipe Springs. San Felipe Springs are where the Edwards-Trinity Aquifer naturally reaches the surface under artesian pressure through a fault in the rock. The San Felipe Springs are the fourth largest springs in Texas and consist of ten or more springs that extend over a mile along San Felipe Creek (USGS 1995). The San Felipe Springs produce an average of 135 to 150 cubic feet per

second (cfs) (USFWS 1999). These springs are located approximately five miles west north-west of Laughlin AFB.

3.3.8.3 Floodplains

EO 11988, *Floodplain Management*, requires that federal agencies provide leadership and take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands.

Three 100-year floodplains are present on Laughlin AFB. The most recent designation of the floodplains was in 1987 (FEMA 1987). The floodplains present on Laughlin AFB are associated with Sacatosa Creek, Zorro Creek, and an unnamed tributary. The floodplain connected with Sacatosa floodplain is located on the eastern edge of Laughlin AFB, following Sacatosa Creek. The second floodplain is located on the northwest edge of Laughlin AFB, following Zorro Creek. The third floodplain is located at the southern most edge of Laughlin AFB below the treatment lagoons, following the unnamed tributary (FEMA 1987). The locations of the activities associated with the Proposed Action and alternatives are not located within these floodplains.

3.3.9 Hazardous Substances

3.3.9.1 Hazardous Materials

Hazardous material use and management at Laughlin AFB are regulated under the Toxic Substance Control Act (TSCA), Occupational Safety and Health Administration (OSHA), Emergency Planning and Community Right-to-Know Act, and Air Force Occupational Safety and Health Standards. The regulations require personnel using hazardous materials to be trained in the application, management, handling, and storage of material; know the location of material safety data sheets (MSDSs) for all hazardous materials that they are using; and wear the correct personal protective equipment (PPE) required for materials that are being used. Laughlin AFB has a Prevention Management Action Plan in place that documents management, measurement, and reporting goals in relation to hazardous materials located on Laughlin AFB and all associated property. This plan is to be followed. A list of hazardous chemicals, including MSDSs used on-base are located in Building 75 (USAF 2006b).

Current operations at Laughlin AFB and associated property require the use of hazardous materials in varying quantities. Hazardous materials are used by military personnel and on-base contractors throughout the base. The location of hazardous materials, procedures and equipment at Laughlin AFB used to prevent and clean up a release, and actions to be taken in the event of a release are located in the *Laughlin AFB Spill Prevention Control and Countermeasures Plan* (USAF 2006X).

3.3.9.2 Asbestos

A 1993 base-wide survey prepared for Laughlin AFB indicates that asbestos-containing material (ACM) was present in 95 percent of on-base buildings. Laughlin AFB maintains the results of this base-wide survey and can be queried by building number (USAF 2005d).

ACM is potentially present in pipe insulation, cement pipe, floor tile, floor tile adhesive, roof patching sealant, wall board in mechanical closets, wall and ceiling texture, and wall board panels. An Asbestos Management Plan is in effect at Laughlin AFB, and qualified contractors are hired to perform abatement and removal when applicable (USAF 2003b). The plan details procedures for notification, record keeping, protection, and abatement associated with ACM. The Asbestos Management Plan ensures that Laughlin AFB is in compliance with all ACM related federal, state, and local regulations.

3.3.9.3 Lead Based Paint

At this time, a base-wide lead based paint (LBP) survey has not been conducted; however, a survey of the Military Family Housing (MFH) was conducted in the 1993 to 1994 timeframe. Due to the lack of a base-wide survey, it must be assumed that all facilities constructed prior to 1980 have the potential to contain LBP. LBP can be found on windowsills, baseboards, doors, exterior trim work, front and back porches, molding, and baseboards.

Laughlin AFB currently maintains a database related to the limited LBP survey conducted on-base, and has a LBP Management Plan. The database currently contains information from surveys conducted after a 1995 Base-wide LBP assessment. All LBP information prior to 1995 has been lost or destroyed. The LBP Management Plan establishes responsibilities, procedures for assessing risk, hazard management and risk reduction, medical screening, record keeping, and waste disposal requirements, and provides for capture or removal of LBP scrapings or dust. Historic painting activities did not include capture and proper disposal of paint scrapings or dust; therefore, it is possible that the soil in areas where LBP was used may exhibit elevated concentrations of lead (USAF 2006a). Currently families receiving MFH are notified of the possible presence of LBP prior to taking occupancy.

3.3.9.4 Pesticides

Pesticide application is routinely performed and managed by the Base Operating Support contractor. The central bulk storage facility for pesticides is located at Building 129, the Civil Engineering maintenance area (USAF 2006b). Commercially available pesticides and herbicides are applied as needed along roadways, fire breaks, and pre-determined locations (spot applications) throughout Laughlin AFB. Application and use of these and all pesticides and herbicides are done in accordance with the Integrated Pest Management Plan (USAF 2005c).

Historic pesticide applications have occurred throughout Laughlin AFB. Historical pesticides included diazinon, allethrin, chlordane, and pyrethrin-based products. These products were used within appropriate guidelines for application at the time that they were used. Historically, chlordane was injected beneath foundations of buildings when termite infestations were observed. Due to the persistence of chlordane in the environment, it is likely that concentrations of chlordane may be present in soils (USAF 2005d).

Prior to the development of these areas for military use, the land was cultivated for agricultural purposes. Laughlin AFB construction began in 1942, prior to the wide spread use of pesticides and herbicides in agriculture (USAF 2006b).

3.3.9.5 Hazardous Waste

Hazardous wastes are defined by the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, RCRA subtitle C (40 CFR, Parts 260 through 270). The USEPA regulatory authority is delegated to the State of Texas. Hazardous waste management at Laughlin AFB is also regulated under AFI 32-7013, *Hazardous Waste Management and Minimization*.

These regulations are implemented at Laughlin AFB through hazardous waste permitting procedures and the Laughlin AFB Hazardous Waste Management Plan. The plan details hazardous waste packaging, turn-in, transportation, storage, recordkeeping, and emergency procedures. Approximately 457 pounds of RCRA hazardous waste and 280 non-RCRA waste were generated and disposed of at an off-site treatment, storage, and disposal facility during the first quarter of 2006 (USAF 2006d). Hazardous waste is generated at Laughlin AFB from aircraft maintenance, laboratory chemicals, spent hazardous materials, and spills. Air Force waste management operations at Laughlin AFB are registered with the USEPA under identification number TX2571524105 (TCEQ 2006b).

Day-to-day operations generate multiple types of hazardous wastes that require special handling and proper disposal. These include oils and fuels, cleaning compounds, paints, solvents, and batteries. Hazardous wastes are collected at 35 waste and satellite accumulation points and are then transferred to the Laughlin AFB permitted interim storage facility at Building 2026. Once at Building 2026, the waste is removed by a certified contractor within 90 days for off-base treatment/disposal at an appropriate facility (USAF 2006e).

3.3.9.6 Environmental Restoration Program

The ERP, formerly known as the Installation Restoration Program, was implemented by the DoD to identify and evaluate areas and constituents of concern of toxic and hazardous material disposal and spill sites. Once the areas and constituents had been identified, the ERP was tasked to remove the hazards in an environmentally responsible manner. All response actions are based upon provisions of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), and the *Superfund Amendments and Reauthorization Act of 1986* as clarified in 1991 by EO 12580, Superfund Implementation.

Laughlin AFB has a total of 20 ERP sites and 4 AOCs. Currently 12 of the ERP sites are closed or pending closure with no further action required. All 20 ERP sites and 4 AOCs are located within one-half mile of all the proposed construction activities. Figure 3-7 shows the location of the ERP sites and AOCs and Table 3-9 provides additional information about the ERP sites and AOCs (USAF 2005e). The information provided below on the eight active ERP sites and four AOC have been summarized from the ERP Management Action Plan.

Three ERP sites are currently undergoing long term monitoring (LTM), DP007, FT005, and SS016. ERP site DP007, the sludge disposal area, involves groundwater and potential soil contamination with 1-1, trichloroethane. The information on soil contamination is not known at this time. Currently, groundwater monitoring is on-going but remediation activities have not commenced. At ERP site FT005, fire training area, both the soil and groundwater are considered

contaminated. The groundwater is contaminated with xylene; toluene; sec-butylbenzene; phenol; naphthalene; di-n-octylphthalate; cumene; chloroform; benzene; arsenic; 1,3,5-trimethylbenzene; and 1,2,4-trimethylbenzene. The groundwater contamination is being remediated in two phases: free product recovery and air sparging. Free product recovery was conducted from 1997 to 1998. Air sparging commenced in 2004 and is currently on-going. To monitor the results of the remediation activities, groundwater sampling is conducted throughout the site area. The soil contamination at FT005 is currently under investigation. Coordination with Environmental Flight must occur prior to conducting any construction activities near FT005. ERP site SS016, MARS (Military Affiliate Radio System) building, has been identified as having TCE contaminated groundwater. On-site bio-remediation activities and associated monitoring are on-going.

Six ERP sites are currently under remedial investigation: PS018, SS004, SS014, SS015, SS019, and SS020. PS018, Building 800 pesticide facility, involves concentrations of acetone observed within the groundwater. The remedial investigation has been schedule but has yet to take place. SS004, DRMO, has contaminated soils throughout the site. The soils are contaminated with total petroleum hydrocarbons, PCBs, and pesticides. The contaminated soils are to be remediated in the 2008 to 2009 timeframe by removing the contaminated soils and disposing of them in a regulated disposal facility. SS014, Fuel Receiving and Storage Areas, has groundwater contamination present. The groundwater is contaminated with 1,2,4-trimethylbenzene; 1,2-dichloroethylene; 1,3,5-trimethylbenzene; arsenic; benzene; chloroform; cumene; naphthalene; toluene; trichloroethylene; and vinyl chloride. Remediation activities and associated monitoring are anticipated to commence during the fiscal year of 2008. SS015, the storm drainage ditch, has heavy metals and solvent contaminated soils located within the entire site. The remediation activities are on-going and consist of removing the contaminated soils and disposing of the contaminated soil at a regulated disposal facility. The remediation effort is scheduled to be completed by the end 2007. SS019, Building 116 HVAC shop, involves groundwater contaminated with 1,1,1-trichloroethane; 1,1-dichloroethane; acetone; tetrachloroethylene; TCE; and vinyl chloride. Additional sampling and determination as to the extent of the groundwater contamination is planned to occur in the 2007 to 2008 timeframe; and based upon those findings, remediation activities will commence in 2010. The last ERP site that is under remedial investigation is SS020, Jet Engine Test Cells Area. SS020 has acetone; 1,1-dichloroethylene; and TCE contaminated groundwater. A remedial investigation is to be conducted in 2007; and based upon the finding of the investigation, the remedial action scheduled is natural attenuation.

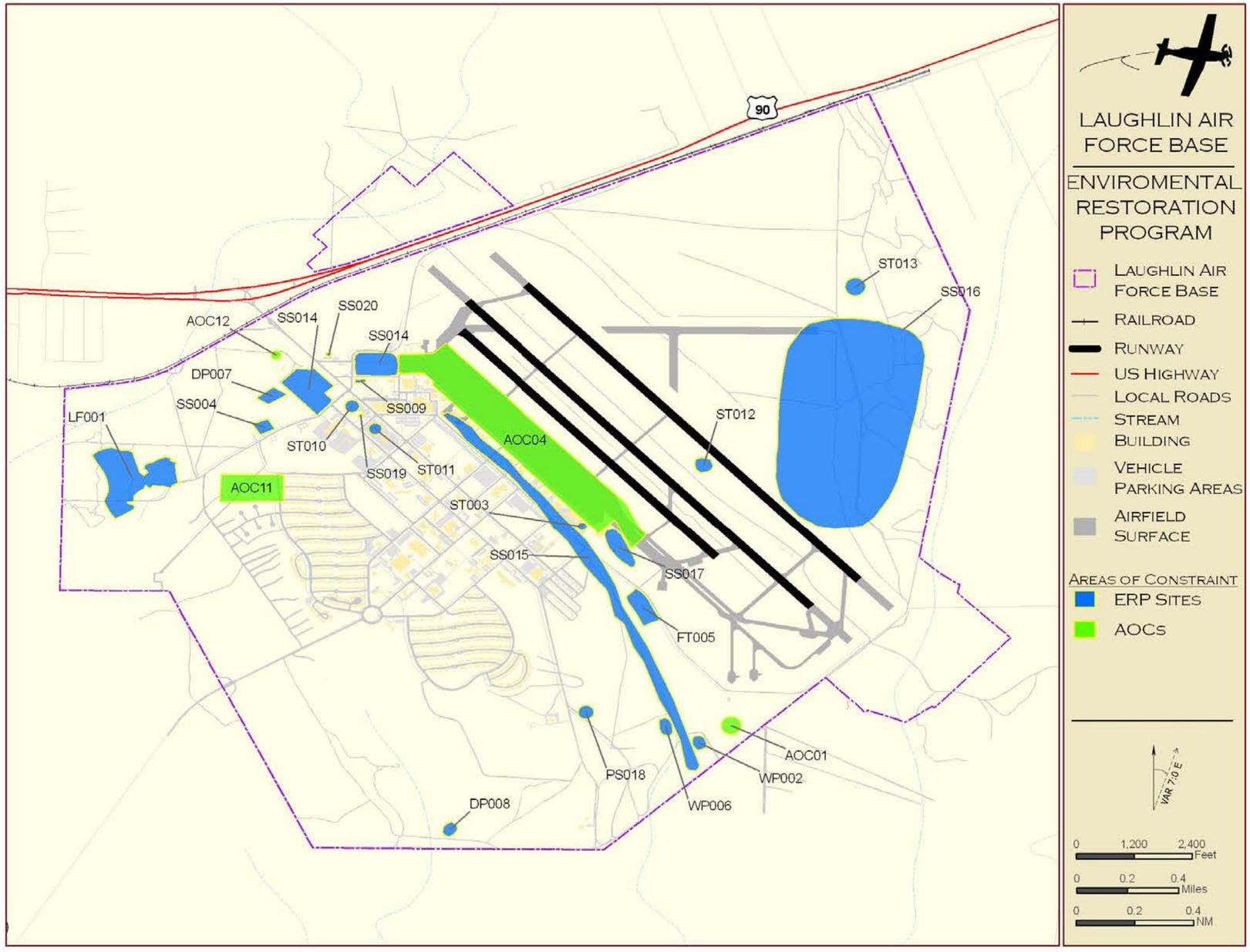
One of the ERP sites, SS017 (the area south of the flightline) is undergoing a feasibility study concurrently with a remedial investigation. SS017 has groundwater contaminated with: bis(2-ethylhexyl)phthalate; bromodichloromethane; chloroform; cis-1,2,-dichloroethylene; tetrachloroethylene; toluene; TCE; and trichloroflouromethane. Currently, the source of the groundwater contamination has not been identified; and, the contamination is contained to groundwater located on base. Based upon the findings of the feasibility study and the remedial investigation, the remediation activity will be determined and conducted.

Four AOCs are located within one-half mile of Proposed Action activities, these AOCs are AOC01, AOC04, AOC11, and AOC12. AOC01, the gun alignment facility, underwent a site investigation that was completed in 2005. During the investigation, all lead-jacked steel shells

were removed from the site. At this time the next phase of remedial activity has not been determined. AOC04, the flight apron, has undergone a site investigation. It was observed that no soil and groundwater contamination was present. Due to the findings of the site investigation, Laughlin AFB will apply to have the site defined as an area of no further response action required. AOC11 is a former ordnance storage facility that is currently undergoing a site investigation. Based upon preliminary results, it is believed that this site does not have contamination present. The last AOC is AOC12, the tar disposal area. AOC12 has undergone remediation activities and is currently awaiting regulator approval for closure.

(no document text this page)

Figure 3-7 Laughlin ERP Sites and AOCs for Laughlin AFB



(no document text this page)

Table 3-9 Laughlin AFB Environmental Restoration Program – ERP Sites and AOC Located Within One-Half Mile of Proposed Construction Activities

Site ID	Site Name	Regulatory Phase	Description
AOC01	Gun Alignment Facility	PA	Site is located near the southwest end of the flightline. The facility was used to adjust the sights on T-33 aircraft from 1953 to 1955 and as a small arms range. The ammunition consisted of lead-jacketed 50 caliber steel shot shells. The lead jackets have been removed from the site. Awaiting regulator approval of closure letter.
AOC04	Flightline Apron	NFRAP	Site includes the entire flightline apron from Taxiway G to the buildings along 2nd Street. Analytical results indicate no significant impacts to soil or groundwater.
AOC11	Former Ordinance Storage Area	NFRAP	There is no indication that soil or groundwater contamination is present at this site.
AOC12	Tar Disposal Area	RA	Site is an area that is 20 by 100 feet used for disposing of tar. Remediation activities have been completed. Awaiting regulator approval of closure letter.
LF001	Base Landfill	NFRAP	Used as a household and industrial waste trench and fill landfill from 1942 to 1974. Bulk liquids, drums of dichlorodiphenyltrichloroethane (DDT), and cyanide crystals were disposed of at this landfill. A two-foot thick cap has been installed over the landfill. The Environmental Restoration Program site was approved for No Further Response Action Planned (NFRAP) status on 1 December 1987.
DP007	Sludge Disposal Area	LTM	Site is located approximately 1,500 feet south of the northwest boundary and immediately west of the petroleum, oil, and lubricants bulk storage area. The site was historically used to dispose of sludge from the bottom of fuel storage tank for an unknown period of time. There is a potential for surface water contamination.
DP008	South Boundary Dike	NFRAP	Site is located along the southern boundary pond. A one-time release of waste solvent occurred in 1974. NFRAP letter was signed on 11 January 2000.
FT005	Firefighter Training Area	RA and LTM	Site is approximately 7.4 acres and consists of two unlined pits that were used to conduct fire training activities from 1952 to 1983. One pit was used from 1952 to 1974; and the second pit was used from 1974 to 1983. In 1983, the pit used from 1974 to 1983 was redesigned and met current regulatory requirements. Aviation gasoline (AVGAS), motor gasoline (MOGAS), jet propellant-4 (JP), and JP-8, engine oil, transformer oil, solvents, and extinguishing agents were used at this site. Free product was removed from 1997 to 1998. Site includes groundwater and soil contamination. Currently groundwater remediation is ongoing.
PS018	Building 800 Pesticide Facility	RI	Site is a former pesticide storage facility. Site includes potential groundwater contaminated with acetone.
SS004	Defense Reutilization and Marketing Office (DRMO)	RI	Site was located northeast corner of DRMO complex to store drummed hazardous waste (pesticides and waste oils containing Polychlorinated Biphenyls [PCBs]) awaiting transportation off base for disposal. The site was in use from 1982 to 1991. Fluids and rainfall that accumulated within the compound were channeled into sump, liquids contained within the sump were sampled prior to disposal on surrounding soil. The proposed remediation activities include removal of soils beginning in 2009.
SS009	Supply Storage Area	NFRAP	Site is a concrete pad located near the intersection of Kansas Avenue and Liberty Drive. Historically, the site was used to store approximately 40 drums containing Dichlorodiphenyltrichloroethane (DDT) from 1973 to 1981.
SS014	Fuel Receiving and Storage Area	RI	Site is located in the north central area of Laughlin, adjacent to the northwest portion of the flightline area. Historically, the site was used for the storage and transportation of JP-4 and AVGAS. Facility is composed of a six 25,000-gallon underground storage tank (UST), underground distribution lines, and a pumping station. The pipelines are no longer in use and have been grouted in-place. The UST and the distribution line areas have shown signs of groundwater and soil contamination. Remediation and associated monitoring is scheduled to commence in 2008.
SS015	Storm Drainage Ditch	RI	The site is an open channel that accepts runoff from the flightline industrial area along Second Street via surface runoff and the western portion of the flightline via a substation drainage system. The site discharges to Sacatosa Creek. Prior to 1974 the drainage ditch was a conduit for industrial rinse waters contaminated with heavy metals and solvents that were channeled to Retention Basin, WP002.
SS016	MARS Building and Area	LTM	Site located on the eastern side of Laughlin AFB in the vicinity of the Military Affiliate Radio System (MARS) building. Analytical results report that groundwater located beneath the site is contaminated with Trichloroethylene (TCE), the source of contamination has not been identified. Remediation activities and monitoring are on-going.

Table 3-9 Laughlin AFB Environmental Restoration Program – ERP Sites and AOC Located Within One-Half Mile of Proposed Construction Activities (Continued)

Site ID	Site Name	Regulatory Phase	Description
SS017	Area South of the Flightline	FS	Site is located south of the parking area. Analytical results indicated a groundwater plume of Perchloroethylene (PCE), the source of the contamination has not been identified. The contamination will be remediated via in-situ bioremediation. Awaiting regulator concurrence on future actions.
SS019	Building 116 HVAC Shop	RI	Site was constructed in 1966 and demolished in 2000. The site was used as a maintenance and air filter cleaning facility. Drums, containing TCE, were stored on site from 1971 through the mid 1980s. Analytical results indicate groundwater contamination present at the site.
SS020	Jet Engine Test Cells	RI	Site located at the north side of Alabama Avenue and easy of Liberty Drive at the current location of Building 7. The site was in use from the 1960s to the early 1970s. Analytical results indicate groundwater contamination from solvents and fuels.
ST003	Defuel Pit	NFRAP	Site is the location of a former 1,000-gallon UST underneath aircraft parking apron next to Building 414. From 1942 to 1974; oils, solvents, transformer oils, and waste fuel were stored within the tank. After 1974, JP-4 was stored within the tank. The tank was removed in 1989.
ST010	Facility 121 – 1 UST	NFRAP	Site includes one 290-gallon UST used to store MOGAS, and was located at Facility 121. The UST was removed in 1988, tank was not breached and surrounding soils were not impacted.
ST011	Facility 126 – 1 UST	NFRAP	Site includes one 280-gallon UST used to store MOGAS, and was located at Facility 126. The UST was purportedly removed in 1974. In 1988 an attempt to find the tank was made, the tank was not found. No contamination had been identified.
ST012	Facility 640 – 2 USTs	NFRAP	Site includes two USTs used to store MOGAS at Facility 640. The tanks were removed in 1988, when removed the tanks appeared to be intact. No contamination had been identified.
ST013	Facility 660 – 1 UST	NFRAP	Site included one 255-gallon UST used to store MOGAS at Facility 660. The tank was removed in 1988, when removed the tank appeared to be intact. No contamination had been identified.
WP002	Old Industrial Waste Pond	NFRAP	Site was originally a 4-acre soil quarry. Until 1976, the site was used as a retention pond, capturing rainfall and sheet flow from the flightline. Effluent entered the pond through a pipe that connected the Storm Drainage Ditch (SS015). The direct discharge of liquid wastes from the corrosion control and chemical cleaning shops continued until 1980.
WP006	New Industrial Waste Pond	NFRAP	Site is located on the west side of the Storm Drainage Ditch, SS015, and was used to provide additional retention capacity for the Old Waste Pond, WP002. Historically, there was potential for unidentified waste from corrosion control or cleaning shops to be released into the site. In 1976 the site was abandoned when all industrial discharges were routed through oil/water separators and into the sanitary sewer system. A remedial investigation had been conducted from 1996 to 2006.

Notes:
AOC = Area of Concern
AVGAS = Aviation Gasoline
DDT = Dichlorodiphenyltrichloroethane
DRMO = Defense Reutilization and Marketing Office
FS = Feasibility Study
HVAC = Heating, Ventilation, and Air Conditioning
JP = Jet Propellent
LTM = Long Term Monitoring
MARS = Military Affiliate Radio System
MOGAS = Motor Gasoline
NFRAP = No Further Response Action Planned
PCB = Polychlorinated Biphenyls
PA = Preliminary Assessment
PCE = Perchloroethylene
RA = Remedial Actions
RI = Remedial Investigation
TCE = Trichloroethylene
UST = underground storage tank

3.3.10 Safety

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. The elements of an accident-prone environment include the presence of a hazard and an exposed population at risk of encountering the hazard. Numerous approaches are available to manage the operational environment to improve safety including reducing the magnitude of a hazard or reducing the probability of encountering the hazard. The primary safety categories discussed here include Aircraft Flying Safety, Bird/Wildlife-Aircraft Strike Hazard (BASH), Munitions and Explosives Safety, and Construction Safety.

3.3.10.1 Aircraft Safety

The existing environment for aircraft safety is based on the physical risks associated with aircraft flight and current military aircraft operation procedures. Aircraft mishaps might involve mid-air collisions with other aircraft; collisions with objects such as towers, buildings, or terrain; weather-related accidents; and bird/wildlife-aircraft collisions. Historical mishap databases enable the military to calculate the mishap rates for each type of aircraft. These rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft. Safe flying procedures, adherence to flight rules, and knowledge of emergency procedures form consistent and repeated aspects of training for all aircrews. Since the inception of the Air Force in 1947, aircraft accidents have steadily declined each year.

The United States Air Force Safety Center has defined four classifications of mishaps: Classes A, B, and C; and High Accident Potentials. Class A mishaps result in a total cost in excess of one million dollars for injury, occupational illness, and property damage; a fatality or permanent total disability; or destruction or damage beyond economical repair to Air Force aircraft. Class B mishaps result in a total cost in excess of 200,000 dollars (but less than one million dollars) in property damage, permanent partial disability, or hospitalization of five or more personnel. Class C mishaps result in total damage that costs in excess of 10,000 dollars (but less than 200,000 dollars), or an injury or occupational illness that results in a loss of worker productivity greater than eight hours. Mishaps not meeting the definitions of Class A, B, or C, but, because of damage or injury, necessitate Air Force reporting, are classified as High Accident Potentials.

Historical data on aircraft mishaps for Laughlin AFB, including SUA and auxiliary airfields, are included in Tables 3-10 through 3-12 for T-6A Texan II, T-38C Talon, and T-1A Jayhawk aircraft respectively. The combined rate of Class A and Class B mishaps is less than three mishaps per 100,000 hours of flight time for the T-6 and T-38C aircraft (Cranston 2006).

Table 3-10 Historical Data on T-6 Mishaps at Laughlin AFB (FY 2001–FY 2006)

Fiscal Year	Class A		Class B		Fatal		Hours Flown	Cumulative Hours
	Count	Rate[a]	Count	Rate[a]	Pilot	All		
2001	0	0.00	0	0.00	0	0	0	0
2002	0	0.00	0	0.00	0	0	0	0
2003	0	0.00	0	0.00	0	0	7,691	7,691
2004	0	0.00	0	0.00	0	0	25,218	32,909
2005	0	0.00	0	0.00	0	0	41,302	74,211
2006	0	0.00	1	2.38	0	0	42,090	116,301
Total/Cumulative Rate[b]	**0**	**0**	**1**	**0.86**	**0**	**0**	**116,301**	

Source: Cranston 2006
Notes:
[a] Rate of mishap per 100,000 hours flown that year.
[b] Rate of mishap per 100,000 cumulative hours flown

Table 3-11 Historical Data on T-38C Mishaps at Laughlin AFB (FY 2001–FY 2006)

Fiscal Year	Class A		Class B		Fatal		Hours Flown	Cumulative Hours
	Count	Rate[a]	Count	Rate[a]	Pilot	All		
2001	0	0.00	0	0.00	0	0	22,375	22,375
2002	0	0.00	0	0.00	0	0	21,335	43,710
2003	0	0.00	0	0.00	0	0	21,067	64,777
2004	0	0.00	0	0.00	0	0	19,459	84,236
2005	0	0.00	0	0.00	0	0	17,836	102,072
2006	1	6.11	0	0.00	0	0	16,368	118,440
Total/Cumulative Rate[b]	**1**	**0.84**	**0**	**0**	**0**	**0**	**118,440**	

Source: Cranston 2006
Notes:
[a] Rate of mishap per 100,000 hours flown that year.
[b] Rate of mishap per 100,000 cumulative hours flown

Table 3-12 Historical Data on T-1A Mishaps at Laughlin AFB (FY 2001–FY 2006)

Fiscal Year	Class A		Class B		Fatal		Hours Flown	Cumulative Hours
	Count	Rate[a]	Count	Rate[a]	Pilot	All		
2001	0	0.00	1	3.23	0	0	30,940	30,940
2002	0	0.00	0	0.00	0	0	32,740	63,680
2003	1	3.09	0	0.00	0	0	32,386	96,066
2004	0	0.00	1	3.14	0	0	31,887	127,953
2005	0	0.00	0	0.00	0	0	29,155	157,108
2006	0	0.00	0	0.00	0	0	29,268	186,376
Total/Cumulative Rate[b]	**1**	**0.54**	**2**	**1.07**	**0**	**0**	**186,376**	

Source: Cranston 2006
Notes:
[a] Rate of mishap per 100,000 hours flown that year.
[b] Rate of mishap per 100,000 cumulative hours flown

By multiplying the cumulative incident rate per 100,000 hours by the hours flown in the most recent year of data (2006), an average number of mishaps per year rate can be determined. The inverse of this number provides an estimate of the average time interval between aircraft mishaps. Based on 2006 flying hours and the aircraft mishaps rates shown above, a Class A or B mishap occurs on average once every 2.76 years for the T-6A, once every 7.27 years for the T-38C, and once every 2.12 years for the T-1A

3.3.10.2 Bird/Wildlife-Aircraft Strike Hazard

BASH is a safety concern because of the danger a strike poses to aircraft and aircrews. Birds might be encountered at altitudes as high as 30,000 feet or more. However, most birds fly close to ground level. Approximately 95 percent of all reported bird have occurred below 3,000 feet AGL. About half of these bird strikes occur in the airport environment and approximately one-third occur during low-altitude training. At Laughlin AFB, there are many common bird types that might be present and pose a hazard. Waterfowl are usually only a hazard during the migratory season. Waterfowl typically migrate at night, and generally fly between 1,500 and 3,000 feet AGL during the fall migration and between 1,000 and 3,000 feet AGL during the spring migration. Additionally, other large avian species, such as hawks, turkey vultures, and gulls, pose a threat to military aircraft (USAF 2006f).

The Air Force devotes considerable attention to avoiding the possibility of bird/wildlife-aircraft strikes. It has conducted a worldwide program for decades to study bird migration, bird flight patterns, and past strikes to develop predictions of where and when bird/wildlife-aircraft strikes might occur. This program, which consistently updates the data, also defines avoidance procedures through a Bird Avoidance Model (BAM). Each time an aircrew plans a training flight along an established training route or other training airspace, they use the BAM to define altitudes and locations to avoid. Use of this model has minimized bird/wildlife-aircraft strikes. Each installation or flying unit also develops and maintains a BASH plan that dictates the location and timing of avoidance measures at the airfield and within the airspace used by the unit. Installation BASH Plans provide strategies and protocols, which are coordinated and

approved by the USFWS, to reduce the risk of BASH accidents (USAF 2006f). A summary of bird/wildlife-aircraft strikes for the last five years is provided in Table 3-13 below.

Table 3-13 Bird/Wildlife-Aircraft Strikes at Laughlin AFB (Calendar Years 2001–2006)

Calendar Year	Number of Strikes Involving T-6 Aircraft	Number of Strikes Involving T-38C Aircraft	Number of Strikes Involving T-1A Aircraft
2001	0	20	28
2002	0	22	34
2003	12	29	38
2004	20	25	44
2005	40	33	62
2006	12	14	44
Total	**84**	**143**	**250**

Source: Cranston 2006

3.3.10.3 Munitions and Explosives Safety

Explosive safety zones (ESZs) are required for areas where ordnance are stored or handled. ESZs are typically determined based on the net explosive weight of the ordnance to be stored or handled and the blast-resistant properties of the magazine. Explosive Safety QD arcs are used to delineate the extent of each ESZ and help avoid incompatible land uses near munitions storage facilities. ESZ requirements are specified in Air Force Manual 91-202, *Explosive Safety Standards*. Laughlin AFB maintains two munitions storage facilities on the southeast corner of the installation. Building 950 is used to store small arms and aircraft egress items, and Building 905 is used for the inspection and maintenance of munitions and egress items. Both of these buildings have a QD arc of 700 feet, measured from the outside walls of the building. A hot cargo pad, which is used approximately twice a year for training, also exists on the west side of the airfield with a QD arc of 2,000 feet.

3.3.10.4 Construction and Demolition Safety

Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of on-site military and civilian workers are safeguarded by numerous DoD and Air Force regulations designed to comply with standards issued by OSHA and USEPA. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors. The 47th FTW maintains a Ground Safety program to minimize the risk of accidents associated with day-to-day ground operations including construction.

3.3.11 Utilities and Infrastructure

For the purposes of analyzing Laughlin AFB utility systems, an effective population metric has been developed providing a more accurate representation of the effective 24-hour population that installation utility systems must support. Under this metric, Laughlin AFB personnel who live off-base are weighted by a factor of one-third to represent their average eight-hour per day demand on installation utilities. By this calculation, Laughlin AFB currently has an effective population of 2,582.

Table 3-14 Laughlin AFB Effective Population

Category	Population	Effective Population Factor	Effective Population
On-Base Personnel (24-hr population)	1,753	1.00	1,753
Off-Base Personnel [a] (8-hr population)	2,486	0.33	829
Total	**4,239**	**--**	**2,582**

Source: USAF 2005a
Notes:
hr = hour
[a] 765 military dependents residing off base are not included in the eight-hour population for the installation.

3.3.11.1 Potable Water

Laughlin AFB maintains a pumping station at San Felipe Springs which consists of two 1,900-gallon per minute (gpm) pumps and a backup pump with a 5,000-gpm capacity. Drinking water for Laughlin AFB is pumped from the station to the installation by way of a 14-inch diameter concrete steel cylinder pipeline and is stored at Laughlin AFB in two above ground storage tanks with a combined capacity of 400,000 gallons (USAF 2005c). Total potable water consumption at Laughlin AFB for FY 2005 was approximately 314 million gallons, or approximately 17 percent of the base's water supply capability of 1,825 million gallons per year. With an installation effective population of 2,582, the per capita average daily consumption of water was approximately 333 gallons. Note that the purpose of this consumption number is to normalize domestic, industrial, commercial, and public water demand on a per capita basis to allow for determination of water consumption under the Proposed Action and Alternative 1. Due to the use of the effective population metric and the representation of industrial, commercial, and public water demands on a per capita basis, the value is high and does not represent an actual "per person" consumption rate for the installation. At the current rate of usage, Laughlin AFB could accommodate a 480 percent increase in consumption. According to the 2006 Laughlin AFB General Plan, the installation's drinking water quality is considered good (USAF 2006b).

3.3.11.2 Sanitary Sewer

Wastewater at Laughlin AFB is treated in a series of aerobic ponds located along the southern boundary of the installation. Treated water is discharged to an unnamed surface drainage (USAF

2005c). In FY 2005, Laughlin AFB generated an average of 193,000 gallons per day (gpd) of wastewater or 39 percent of the base's wastewater treatment capacity of 0.5 million gallons per day (USAF 2005f and USAF 2005b). Based on an effective population of 2,582, this translates into a per capita daily wastewater generation of approximately 75 gallons. At the current rate, Laughlin AFB could accommodate a 163 percent increase in wastewater generation (USAF 2006b).

3.3.11.3 Solid Waste

Municipal solid waste management and compliance at Air Force installations are established in AFI 32-7042, *Solid and Hazardous Waste Compliance*. AFI 32-7042 incorporates by reference the requirements of RCRA Subtitle D (40 CFR 240 through 244, 257, and 258) and all other applicable federal regulations, AFIs, and DoD directives. In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; record keeping and reporting; and recycling of solid waste, as addressed in AFI 32-7080, *Pollution Prevention Program*.

All municipal solid waste generated at Laughlin AFB is collected and transported by a private contractor. This waste is currently disposed of at the Del Rio Landfill, approximately five miles from Laughlin AFB. With a disposal area of approximately 207 acres, the Del Rio Municipal Landfill accepts approximately 62,600 tons of solid waste annually, including construction and demolition (C&D) waste. The Del Rio Municipal Landfill does not keep records of the total amount of C&D waste accepted annually. Assuming current disposal rates, the remaining life expectancy of the landfill is 15 years. There are plans for expansion; however, no land has been acquired yet (Campbell 2006).

In FY 2005, Laughlin AFB disposed of 1,271.18 tons of solid waste to the Del Rio Landfill (USAF 2006e). Laughlin AFB disposed of 765.46 tons of solid waste from October through May in FY 2006 with an average monthly generation of approximately 96 tons (USAF 2006d). Recycling is encouraged for all personnel living and working at Laughlin AFB (USAF 2006e) and the installation recycled 440.219 tons of solid waste from October through May of FY 2006 (USAF 2006d). This equates to a diversion rate of 36.5 percent. During FY 2005, Laughlin AFB diverted 919.34 tons from the landfill through recycling. This equates to a 42 percent overall diversion rate for FY 2005 (USAF 2006e). Based on an effective population of 2,582, this translates into approximately 2.44 lbs of solid waste generated per person per day. Annual solid waste generation rates do not include C&D wastes. Currently, 47 CES/CEV is working with the 47th Contracting Squadron to ensure contractors are required by contract to recycle C&D waste. Construction contractors will also be required to report to 47 CES/CEV quantities of waste recycled and sent to the landfill.

3.3.11.4 Drainage

Storm water runoff from Laughlin AFB is collected in four drainage areas and utilizes open ditches and swales to transport water to three outfalls. Drainage Area 1 diverts storm water runoff to the outfall located in the middle of the southern installation boundary. Water then travels approximately four miles across farmland to Sacatosa Creek. Drainage Area 2 discharges

to Zorro Creek. Drainage Area 3 drains to an outfall on the southern boundary of Laughlin AFB with discharge flowing approximately eight miles to the Rio Grande River. Drainage Area 4 has no outfall and storm water flows across the eastern and northeastern installation boundary onto adjacent farmland and along the railway line to the north (USAF 2006b).

Laughlin AFB operates under a TCEQ Storm Water General Permit issued on March 5, 2003. This permit, TXR150000, was issued under the Texas Pollutant Discharge Elimination System (TPDES) and will expire 5 March 2008 (TCEQ 2003).

3.3.11.5 Transportation

Laughlin AFB has approximately 60 miles of streets and roads, of which approximately 25 miles are asphalt. The remaining streets and roads are gravel or dirt (USAF 2006b). Laughlin AFB is located just outside Del Rio on US Hwy 90. Two gates provide access to the installation—the Liberty or North Gate and the Laughlin Gate or West Gate. Access to Laughlin AFB is primarily via the Liberty Gate located on the north side of the cantonment area on Liberty Drive (USAF 2006b).

The most recent traffic study of the area occurred in March 2002 and was conducted by the Military Traffic Management Command Transportation Engineering Agency (USAF 2002a). During peak traffic times, vehicles at the Main Gate frequently extend to US Hwy 90. The study also identified the Main Gate Railroad Crossing as a hazard to vehicles waiting in queue to enter Laughlin AFB. The study indicated that the one existing inbound processing lane at the Main Gate is not sufficient to adequately handle peak hour traffic without backups, despite the fact that peak-hour traffic counts decreased by 200 vehicles from the previous study conducted in April 2000. The West Gate, however, can operate efficiently with the one existing inbound lane, regardless of the 200 percent increase in peak-hour inbound vehicles from the April 2000 study (USAF 2002a).

3.3.11.6 Electricity/Natural Gas

Electricity is provided to Laughlin AFB by American Electrical Power and natural gas is supplied by West Texas Gas Company (USAF 2006b). Electrical consumption for FY 2005 averaged 117,529 megawatt-hours (MWh) per day, while natural gas consumption averaged 152 thousand cubic feet (kcf) per day (USAF 2005g). Based on an effective population of 2,582, this translates into a per capita daily electrical and natural gas consumption rate of 46 MWh per day and 0.06 kcf per day, respectively. Currently, both systems operate at a fraction of their capacities and have available capacity to support an approximately 200 percent increase over current consumption (Graf 2006).

American Electrical Power distributes electricity to Laughlin AFB by way of two high voltage overhead feeder lines originating from the Hamilton Road substation located outside the installation's northern perimeter. The majority of the cantonment area is serviced by overhead lines, while the family housing area and the airfield both have underground distribution systems. The electrical distribution system has been undergoing upgrades including replacing problematic switchgear. Laughlin AFB maintains 45 power generators providing backup electricity to mission essential facilities (USAF 2006b).

Natural gas is provided to Laughlin AFB by way of a six-inch diameter high pressure, steel pipeline, entering the installation at the southwest boundary. The main lines are 2- and 3-inch polyethylene, and the feeder lines are three-quarter- and 1-inch polyethylene and the system has been rated in good condition.

3.3.12 Socioeconomic Resources

3.3.12.1 Socioeconomic Resources

Laughlin AFB is located approximately six miles east of the Del Rio, Texas community and approximately 150 miles west of downtown San Antonio, within Val Verde County (USAF 2006b). The socioeconomic status of Laughlin AFB and the region are addressed in this section. The scope of this section includes population, housing, education, and economic activity.

3.3.12.1.1 Population

According to the US Census Bureau (USCB), the 2000 estimated population for Val Verde County was 44,856, representing an approximately 15.8 percent increase from 1990 to 2000 (USCB 2006a). An estimated 33,867 people, or 76 percent, of the 2000 Val Verde County population reside in the City of Del Rio (USCB 2006b), with an average family size of 3.09 (USCB 2006b). Del Rio, which is located entirely within Val Verde County, experienced a slower growth rate from 1990 to 2000 compared to Val Verde County. For Del Rio, the 2000 population estimate of 33,867 represents an increase of 8.5 percent over the ten year period (USCB 2006c). In contrast, population growth for the State of Texas from 1990 to 2000 was approximately 22.8 percent (USCB 2006d), and the nationwide population growth was 13.1 percent from 1990 to 2000 (USCB 2006e). In 2006, the City of Del Rio had approximately 35,136 residents, with an expected increase of approximately 5,000 by the year 2020 (Vernon 2006).

Based on the FY 2005 Laughlin AFB Economic Impact Analysis report, there are 714 military personnel living on base (57.6 percent) and 526 living off base (42.4 percent). The exact distribution of on- and off-base military dependents is not known; therefore, the number of on- and off-base dependents was calculated via the same ratio of on- and off-base active duty military. Using this assumption, there are 1,039 active-duty military dependents living on-base (1.45 dependents per person), and 765 off-base military dependents (1.45 dependents per person) (USAF 2005a). The total on-base population at Laughlin AFB is 5,004 personnel, which includes military, dependents, and civilian personnel (USAF 2005a).

3.3.12.1.2 Housing

The Laughlin AFB Housing Requirements and Market Analysis (HRMA) for 2003 defines the housing market area as covering a 60-minute commute or 20 miles from Laughlin AFB's headquarters building or major work centers. The HRMA analyzes data from 2002 and makes projections through 2007. In 2007, there are projected to be 4,295 rental units within the housing market area (USAF 2003c). According to the 2003 HRMA, of the 4,295 rental units, 2,372 units will be considered to be unsuitable by Air Force standards. Of the remaining suitable rental units

(1,923), an estimated 1,708 will be occupied and 215 will be vacant (USAF 2003c). According to the General Plan, there are currently 516 MFH units at Laughlin AFB (USAF 2006b).

3.3.12.1.3 Education

Children who live in permanent quarters on Laughlin AFB, as well as those living off-base in Del Rio attend schools within the San Felipe Del Rio Consolidated Independent School District (CISD).

The San Felipe Del Rio CISD includes eight elementary schools, two middle schools, one freshman school, and one high school. According to the San Felipe Del Rio CISD Pupil Service Coordinator (Limones 2006), the elementary school in this district with the highest percentage of dependents of Laughlin AFB personnel is Ruben Chavira Elementary. For all other grades, there is only one school in the school district. Enrollment and capacities, if known, at these schools are as follows:

- Ruben Chavira Elementary School (grades: kindergarten through fifth) – Enrollment: 575; Capacity: unknown (Casillas 2007)
- Del Rio Middle School (grades: seventh through eighth)– Enrollment: 1,509; Capacity: 2,400 (Carrasco 2007)
- San Felipe Memorial Middle School (grade: sixth) – Enrollment: 763; Capacity: unknown (Casillas 2007)
- Del Rio Freshman School (grade: ninth) - Enrollment: 799; Capacity: 1,000 (Muraira 2007).
- Del Rio High School (grades: tenth through twelfth) – Enrollment: 2,100; Capacity: 2,200 (McCutchinson 2007).

According to Abelardo Casillas, Management Information Systems Director for the San Felipe Del Rio CISD, Ruben Chavira Elementary School is not currently near capacity. However, in the event that the school did reach capacity, above-capacity students would be bussed to other elementary schools within the District. It was also noted that San Felipe Memorial Middle School is not near capacity and could accommodate a large increase in student population (Casillas 2007).

Del Rio High School is currently near capacity; however, the school is expanding in size by adding new wings in order to accommodate an increase in student population unrelated to this action (McCutchinson 2007).

In addition to the public schools listed above, the Del Rio has multiple private primary and/or secondary schools. There is also a junior college and one university within 150 miles of Del Rio: Southwest Texas Junior College and Angelo State University.

3.3.12.1.4 Economy

Laughlin AFB Economic Activity and Contribution. The following information is summarized from the 2005 Laughlin AFB Economic Impact Statement (USAF 2005a).

Laughlin AFB generates economic activity in the region through employee payrolls, service contracts, construction programs and other expenditures. Approximate annual payroll for military personnel living on-base is 24 million dollars, 23 million dollars for those living off-base, and 325,000 dollars for Air National Guard (ANG)/Reservists. The total annual payroll for both military and civilians is approximately 138.3 million dollars. Annual expenditures for Service Contracts, Commissary, Base Exchange, Health Care, Education, and Temporary Duty are 9.6 million dollars. Construction program costs include funds for military construction programs, military family housing, and operations and maintenance, totaling 37.2 million dollars. The number of on-base jobs, including both military and civilian, is 3,200, and other jobs created indirectly is calculated to be 1,189, resulting in a total value of 181.1 million dollars. Thus, the cumulative annual economic impact is estimated to be 227.9 million dollars (payroll is 61 percent, expenditures are four percent, construction programs are 16 percent, and estimated value of jobs created is 19 percent) (USAF 2005a).

Regional Employment and Income. According to the 2000 Census, per capita personal income in Del Rio was 43 percent lower than the US average (USCB 2006f). In 2000, the Del Rio unemployment rate was 6.1 percent, which was higher than the state average for that period (3.8 percent) and the US average (3.7 percent) (USCB 2006f, USCB 2006g and USCB 2006h). In Del Rio, the leading non-governmental industries in 2000 were educational, health, and social services (23 percent of working civilian population); retail trade (14.1 percent of working civilian population); public administration (11.8 percent of working civilian population); and manufacturing (10.5 percent of working civilian population) (USCB 2006i). Twenty-six percent of the population in Del Rio work for federal, state, or local governments, with 1.3 percent employed by DoD (USCB 2006i).

3.3.13 Environmental Justice and Environmental Health and Safety of Children

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, provides that "each Federal Agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." In an accompanying Presidential memorandum, the President specified that federal agencies shall analyze the environmental effects of their proposed actions on minority and low-income communities, including human health, economic, and social effects when such analysis is required by NEPA.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, mandates the investigation of environmental effects on children. This EO acknowledges that children may suffer disproportionately from environmental health risks and safety risks. Therefore, each federal agency is required to make it a priority to identify and assess environmental health and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

This section presents relevant City of Del Rio and Val Verde County data regarding environmental justice, along with an analysis of census reporting areas that would be affected by the proposed and alternative actions. This analysis follows the *Air Force Interim Guidance for*

Environmental Justice Analysis, November 1997, and the CEQ Environmental Justice Guidance under NEPA, December 1997. This section also presents baseline conditions for the health and safety of children.

3.3.13.1 Existing Conditions

In order to determine if minority and low-income populations are disproportionately impacted by the Proposed Action or alternatives, two areas of comparison must first be determined: the potentially affected area, or the ROI, and the larger regional area that includes the affected area and serves as a Community of Comparison (COC). The ROI is the geographic area that would be adversely affected by a proposed project. The ROI for this environmental justice analysis is the City of Del Rio. Val Verde County, which includes the ROI, will be the COC under this environmental justice analysis.

Disadvantaged groups within the ROI and COC, including low-income and minority communities, are specifically considered in order to assess the potential for disproportionate occurrence of impacts. For the purposes of this analysis, disadvantaged groups are defined as follows:

- *Minority Population:* Black or African Americans; American Indians and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; and some other race. For the 2000 Census, race and Hispanic origin (ethnicity) were considered two separate concepts and were recorded separately. For the purposes of this analysis, the total minority race population will be separate from the total Hispanic population to determine total minority race population from the Hispanic total within the affected areas.
- *Low-Income Population:* Person living below the poverty level, according to income data collected in US Census 2000.

Laughlin AFB is located in Val Verde County, approximately six miles east of Del Rio, Texas. In the year 2000, the population of Del Rio was 33,867. Caucasians represented 79.7 percent of the population and minorities represented 20.2 percent. Of the total population, Hispanics or Latinos were the predominant ethnicity at 81.0 percent (USCB 2006j).

Census data for the year 2000 showed the population for Val Verde County as being 44,856. Caucasians represented 78.9 percent of the population and minorities represented 21.1 percent. Hispanics or Latinos were the predominant ethnicity at 75.5 percent (USCB 2006k).

Based on the 2000 Census data, the incidence of persons in the City of Del Rio with incomes below the poverty level was 27.0 percent compared to 26.1 percent in Val Verde County. Nationally, 12.4 percent of the population lives below the poverty level (USCB 2006l, USCB 2006m, USCB 2006n).

In 2000, the total population of the US was 281,421,906. Minorities represented 22.4 percent of the population with 12.3 percent Black or African American; 0.9 percent American Indian and Alaskan Native; 3.6 percent Asian; 0.1 percent Native Hawaiian and Other Pacific Islander; 5.5

percent some other race. A Hispanic or Latino ethnicity was reported by 12.5 percent of the population (USCB 2006o).

Table 3-15 summarizes census data on minority and low-income populations for Del Rio and Val Verde County. Additional information is provided for the State of Texas and the US (USCB 2006p, USCB 2006q).

Table 3-15 Percent Minority Population and Low-Income Population

Demographic Area	Total Population	Total Hispanic/ Latino Population	Percent Hispanic/ Latino	Total Minority Race Population [a]	Percent Minority Race	All Income Levels [b]	Total Low-Income Population	Percent Low Income
City of Del Rio	33,867	27,446	81.0%	6,855	20.2%	33,562	9,066	27.0%
Val Verde County	44,856	33,849	75.5%	9,439	21.0%	44,040	11,507	26.1%
State of Texas	20,851,820	6,669,666	32.0%	5,537,682	26.6%	20,287,300	3,117,609	15.4%
United States	281,421,906	35,305,818	12.5%	63,135,052	22.4%	273,882,232	33,899,812	12.4%

Source: USCB 2006l
Notes:
[a] Minority Race includes Black or African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; and some other race.
[b] All income levels includes everyone except those in institutions, military group quarters, and college dormitories, and unrelated individuals under 15 years old.

Any area who's population consists of greater than 50 percent minorities (including Hispanics or Latinos) or low-income families is considered to be a majority-minority or majority low-income population. Additionally, if the affected area's percentage of minority or low-income population is greater than that of the general population (in this case, the City of Del Rio compared to Val Verde County), the affected area is considered to be a minority or low-income population. Based upon this threshold, the City of Del Rio is a majority-minority population, as well as a low-income population.

Considering that 714 military personnel and 1,039 dependents living on Laughlin AFB, and assuming that there is one dependent spouse for every military personnel, there are approximately 325 children of military personnel living on Laughlin AFB. This is approximately 18.5% of the on base population. Children at Laughlin AFB are exposed to the same environmental setting as the rest of the population on Laughlin AFB.

Chapter 4

Environmental Consequences

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes the potential environmental impacts that are likely to occur as a result of implementation of the proposed or alternative actions. The No Action Alternative provides a baseline against which the impacts of the proposed and alternative action can be compared. A discussion of mitigation measures is included as necessary. Any resultant irreversible or irretrievable commitments of resources are noted as well. Criteria and assumptions used to evaluate potential impacts are discussed at the beginning of each section.

4.2 CHANGE IN CURRENT MISSION

The activities associated with implementation of the proposed or alternative actions would not change the current mission of Laughlin AFB, but would continue to support and, in some areas, increase the current mission of the installation.

4.3 DESCRIPTION OF THE AFFECTS OF ALL ALTERNATIVES ON THE AFFECTED ENVIRONMENT

4.3.1 Airspace Use and Management

An impact to airspace management and use could occur if the Proposed Action or alternative: 1) restricts movement of other air traffic in the area, 2) conflicts with ATC in the region, 3) changes operations within airspace already designated for other purposes, 4) results in a need to designate controlled airspace where none previously existed; 5) results in a reclassification of controlled airspace from a less restrictive to a more restrictive classification; or 6) results in a need to designate regulatory SUA.

4.3.1.1 Proposed Action

Under the Proposed Action, aircraft operations would increase by 21 percent. While notable, this level of activity would not be sufficient to reclassify the airspace surrounding Laughlin AFB or Del Rio International Airport to Class B airspace, largely because that classification is primarily intended for large-scale air carrier airports emplaning over 5 million passengers. The criteria for establishing and maintaining the existing Class C airspace are based on the number of passengers using the primary airports, as well as the number of instrument operations occurring at the primary and satellite airports (FAA 2006b).

The Proposed Action would not restrict the movement of other air traffic in the area. This area of Texas is fairly remote and does not have a high population density. Consequently, the level of civil aviation activity is fairly low compared to other places, such as the east coast or even the San Antonio metropolitan area. Apart from the low traffic counts for civil users, the fact that the Laughlin RAPCON assigns training airspace units and controls all traffic (civil and military) within the Class C airspace allows it to sequence civil users into Del Rio and to use SUA for IFR

traffic when it is not otherwise in use. This is often not the case in other parts of the country where a lack of good radar coverage and communications with the using agency prevents ATC from using SUA when it is active. The Proposed Action would not create a need to develop additional or new controlled airspace, nor does its implementation require regulatory SUA (i.e. a Restricted or Prohibited area).

Civil users operating under IFR may notice an increase in MOA utilization; however, the utilization rates are relatively high already. To the extent that this does occur, civil users operating under IFR to Del Rio International Airport would continue to use the existing corridor between the Laughlin 1 and Laughlin 2 and 3 MOAs. The level of IFR traffic into Del Rio is not such that delays and holding would be expected. It is foreseeable that expansion of the MOAs may become necessary. At that point a separate analysis of that action in coordination and cooperation with the FAA would occur prior to designation of additional airspace. Also, the SUPT and IFF missions are largely daylight and fair weather operations; therefore, during periods of low visibilities and ceilings (i.e. Instrument Meteorological Conditions) many sorties are scrubbed and the airspace becomes available for use by civil users.

Additional flight traffic in the corridor running along and east of the Rio Grande River, between Spofford Auxiliary Airfield and Laughlin AFB may be observed. Spofford Auxiliary Airfield was constructed to relieve traffic pattern saturation at Laughlin AFB by SUPT training aircraft such as the T-6A Texan II currently and its predecessor, the T-37 Tweet. SUPT training aircraft based at Laughlin AFB routinely fly along defined corridors between the two airfields, either prior to using the training airspace or afterward. The Proposed Action would increase T-6A Texan II operations by slightly more than 20 percent and some of that increase would be distributed to the Spofford area. T-38C Talon aircraft do not use Spofford Auxiliary Airfield and the beddown of the IFF mission would not affect that airfield.

4.3.1.2 Alternative 1 – Potential Development Alternative

Under this alternative, flight operations would be identical to those of the Proposed Action and the effects would be the same as described above.

4.3.1.3 No Action Alternative

Under this alternative the additional flying activities associated with the beddown of the IFF mission and the additional T-6A Texan II aircraft would not occur. The affected airspace and airfield environment would be as described in Section 3.3.1.7 and 3.3.1.8.

4.3.1.4 Mitigative Actions

No mitigation actions to the effects from the Proposed Action on airspace use and management are necessary in light of the proposed modest increases to flight operations and the relative low civil aviation traffic counts in the region. However, the Air Force has a program of public outreach to aviators through which it publishes Mid-Air Collision Avoidance (MACA) guides. These brochures, distributed to fixed base operators at nearby airports, are primarily intended for pilots operating under VFR. The MACA contains information on preferred flight tracks, operational characteristics of high-performance military aircraft, and, points of contact to ascertain real-time status of SUA.

4.3.2 Noise

When evaluating noise effects, several aspects are examined, including: 1) the degree to which noise levels generated by training and operations, as well as ongoing construction, demolition, and renovation activities are higher than the ambient noise levels; 2) the degree to which there is hearing loss and/or annoyance; and 3) the proximity of noise-sensitive receptors (i.e., residences) to the noise source. An environmental analysis of noise includes the potential effects on the local population. Such an analysis estimates the extent and magnitude of the noise generated by the proposed and alternative actions.

4.3.2.1 Proposed Action

As depicted in Table 2-2, the Air Force would increase flying operations of the T-6A Texan II from approximately 385,000 per year in FY 2006 to 471,000 in FY 2012 or by 22 percent under this alternative. Operations of the T-38C Talon would be increased from approximately 94,000 per year in FY 2006 to 113,000 annual operations in FY 2012, a 21 percent increase. No change in T-1A Jayhawk operations are planned.

Demolition and construction activities would occur as previously described in Table 2-3.

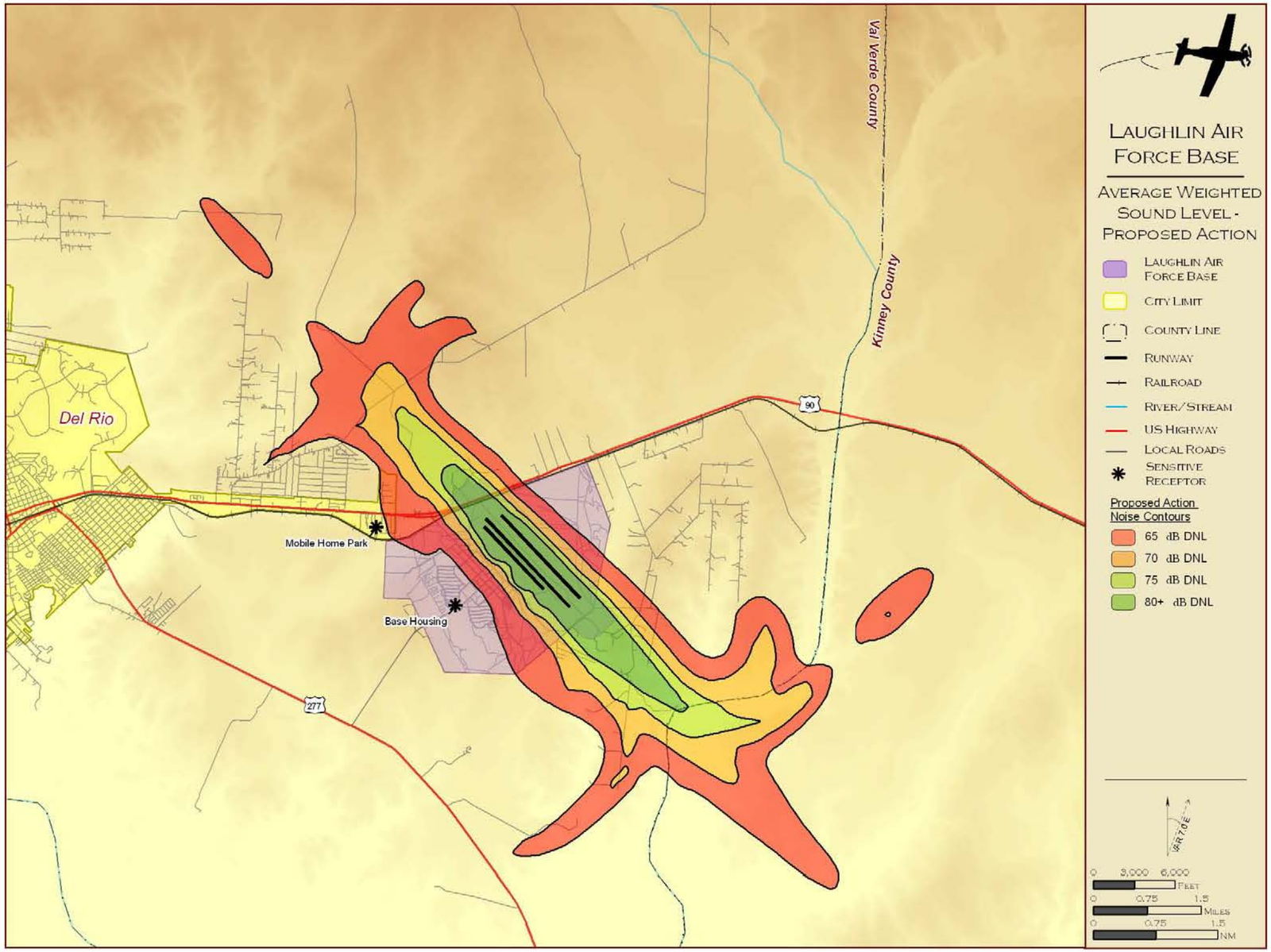
Aircraft Operations

As noted in Section 3.3.1, the DNL is the preferred metric for assessing the impacts to the noise environment from aircraft operations. The DoD AICUZ program sets 65 dB(A) DNL as the threshold for land use planning purposes (see Section 3.3.3) because it correlates reasonably well with a rapid increase of the percentage of persons annoyed from noise.

The noise contours would enlarge slightly if the Proposed Action were implemented. Of interest to the sensitive receptors, the increased operations of T-6A Texan II have a somewhat more pronounced effect because their flight tracks are oriented to the westernmost runway and are therefore closer to the sensitive receptors. Figure 4-1 shows the predicted noise exposure (noise contours) that would be expected if the Proposed Action were implemented. A comparison of the baseline (FY 2006) and Proposed Action predicted noise exposure contours is shown in Figure 4-2. Table 4-1 compares the baseline and Proposed Action acreage lying within the various noise contours.

(no document text this page)

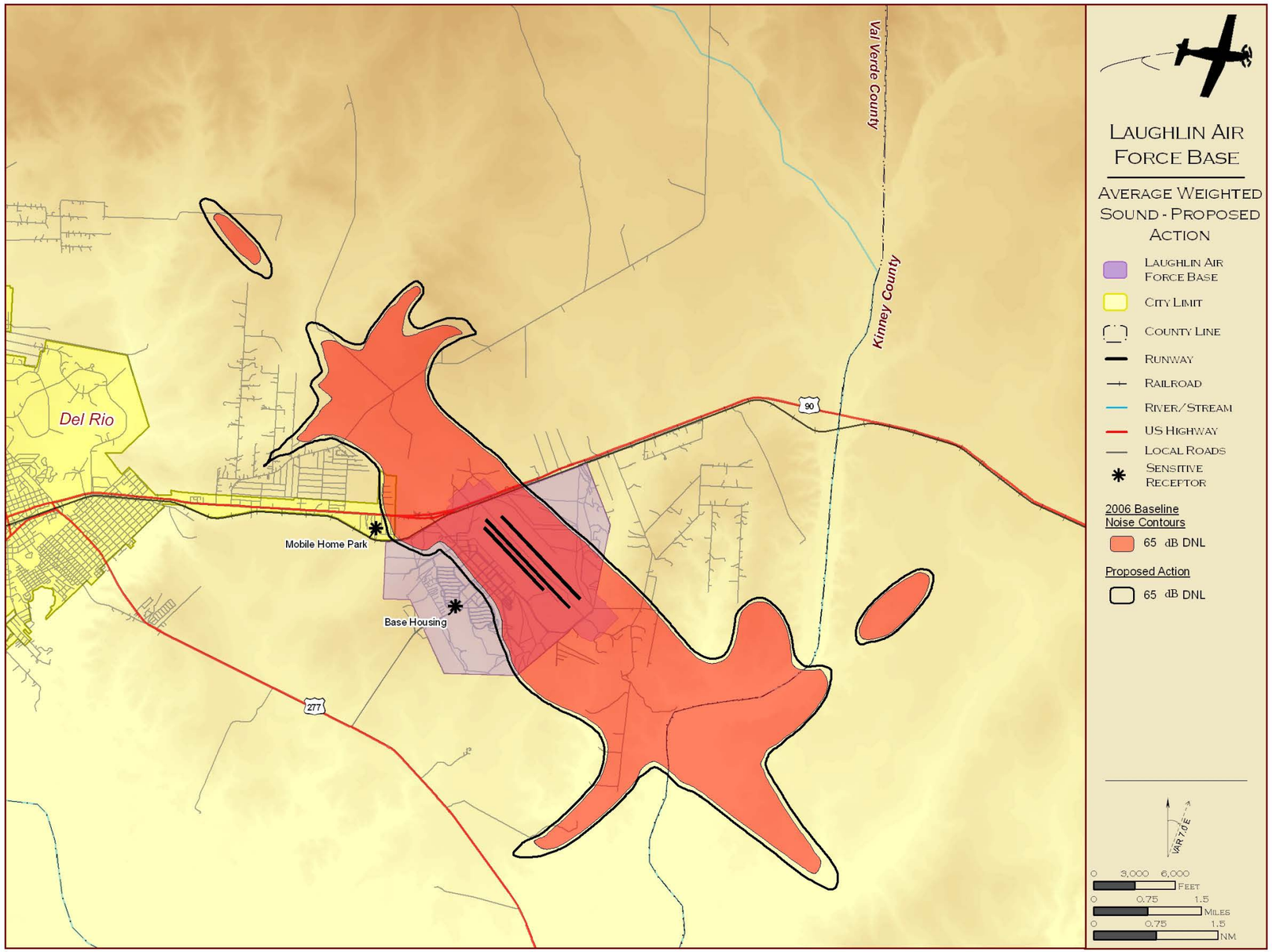
Figure 4-1 Predicted Noise Exposure from Aircraft Operations in Vicinity of Laughlin AFB (FY 2012)



Source: USAF 2006c

(no document text this page)

Figure 4-2 Comparison of Predicted Noise Exposure 65 dB(A) DNL From Aircraft Operations in Vicinity of Laughlin AFB (Baseline and Proposed Action)



Source: USAF 2006c

(no document text this page)

Table 4-1 Land Area Exposed to Baseline and Proposed Action Noise Levels

Noise Level dB(A) DNL	Baseline: Land Area (Acres)	Proposed Action: Land Area (Acres)
65 to 69	5,711.35	6607.6
70 to 74	2,362.06	2694.3
75 to 80	1,173.40	1321.7
>80	1,344.20	1497.4
Total	**10,591.01**	**12,121.0**

Source: USAF 2006c
Notes:
dB(A) = "A-weighted" decibel
DNL = Day-Night Average Sound Level

Below the 65 dB(A) DNL level of exposure, a preferred method of analyzing potential impacts is to examine prevailing ambient noise levels at sensitive receptors and compare the predicted noise exposure from the Proposed Action. It is useful to note that some increases of noise levels are not readily apparent to listeners. Table 4-2 presents noise levels and their corresponding perception.

Table 4-2 Decibel Changes and Perception

Changes in Noise Level (dB)	General Perception
3	Just Noticeable
5	More Noticeable
10	Twice As Loud
20	Much Louder

Notes:
dB = decibel

It is well accepted that sound level increases below 3 dB are not perceptible. Additionally, it should be remembered that due to the logarithmic nature of the dB, a doubling of noise events creates a 3 dB increase. Table 4-3 presents two sites identified by installation personnel as sensitive receptors with the baseline and Proposed Action predicted noise exposure.

Table 4-3 Noise Exposure at Sensitive Receptors

Point Identification	Location/Sensitive Receptor	Baseline: Noise Level (DNL)	Proposed Action: Noise Level (DNL)
1	Point 5,350 feet southwest of Runway 13R/31L (on-base residential area; Base Housing)	60.4 dB(A)	61.2 dB(A)
2	Point 7,840 feet northwest of Runway 13R/31L (off-base residential area; former trailer park)	62.4 dB(A)	63.3 dB(A)

Source: USAF 2006c
Notes:
dB(A) = "A-weighted" decibel
DNL = Day-Night Average Sound Level

Construction Activities

As noted in Section 3.3.2.2, noise associated with construction activities does not typically generate a predicted noise exposure of 65 dB(A) DNL or greater because even at extremely high rates of operation, the equipment itself does not generate noise so intense that averaged over a year would produce a 65 dB(A) DNL. The nature of sound is such that the temporary noise effects from the operation of construction equipment are minor in comparison to the existing noise exposure from aircraft noise. In essence, the aircraft noise masks the noise from construction equipment, or stated another way, the overall contribution to the cumulative noise exposure from construction noise is small compared to the existing noise environment created by the operation of aircraft.

Since the contribution to the DNL by construction generated noise would be minimal (<64 dB[A] DNL) and the location of construction equipment is unknown, it is not possible to determine whether operation of said equipment would cause the existing DNL contours to shift. Therefore, a detailed analysis of construction noise is not performed in this assessment. However, it is foreseeable that increased noise could temporarily occur under the Proposed Action resulting from activities inherent to construction and demolition activities. These activities would produce noise generated by heavy equipment and vehicles involved in demolition, site preparation, foundation preparation, construction, and finishing work. There would be a possibility of short-term, localized speech interference or annoyance near construction zones. In addition, adherence to standard Air Force Occupational Safety and Health regulations would minimizes the risk of hearing loss to construction workers. These regulations require hearing protection along with other personal protective equipment and safety training.

Noise-sensitive receptors would be exposed to construction noise intermittently, and only for the duration of the project; therefore, an extended disruption of normal activities would not be anticipated.

4.3.2.2 Alternative 1- Potential Development Alternative

Under this alternative, flying operations would remain as described for the Proposed Action therefore the effect from flying operations would be the same as described in Section 4.3.2.1.

The effect from operation of construction equipment and similar activities would be similar to the Proposed Action. While this alternative calls for more construction than the Proposed Action, the construction activities would occur over a slightly longer timeframe and the impacts would still be considered short-term and minor.

4.3.2.3 No Action Alternative

Under the No Action Alternative, the increased flight operations associated with the BRAC actions, bedding down additional T-6A Texan II and T-38C Talon aircraft, would not occur. The noise setting would remain as described in Section 3.3.2.2.

4.3.2.4 Mitigative Actions

The Air Force engages in a program of extensive outreach to local communities to facilitate land use planning to foster the establishment of compatible uses in the vicinity of its installations. The AICUZ program at Laughlin AFB is an ongoing process. Upon the completion of the beddown activities, an updated study would be prepared and updated noise contours would be furnished to the adjacent municipalities. Additionally, the nature of training operations at Laughlin tends to mitigate adverse noise effects and annoyance in that very few flight operations and ground engine runs occur after 2200 hours and before 0700 hours.

Though the effects from construction noise are considered minimal, there are several BMPs that could be employed to further reduce its effect on residential areas. One suggestion is to restrict the operation of extremely noisy equipment (e.g., brick cutters or jackhammers) before 0900 hours and after 1700 hours. Additionally, properly operating and maintained equipment (e.g., possessing mufflers, gaskets, sharpened and lubricated blades), maximizing the distance of loud equipment from a residence, directing equipment to use less noise-sensitive routes, fitting silencers to combustion engines, fastening machinery covers or panels tightly, isolating vibrating parts and damping, constructing sound barriers to reduce propagation, or shutting off idling machinery between work periods are other suggestions to reduce construction-associated noises and disturbances (Tempest 1985; Eaton 2000; Suter 2002).

4.3.3 Land Use

A comparative methodology was used to determine impacts to land use at Laughlin AFB. Facility operations and any construction or modification activities associated with each alternative were examined and compared to existing land use conditions and land use plans. Impacts were identified as they relate to changes in land ownership and use classifications, extent of changes, and potential conflicting uses on base and off base.

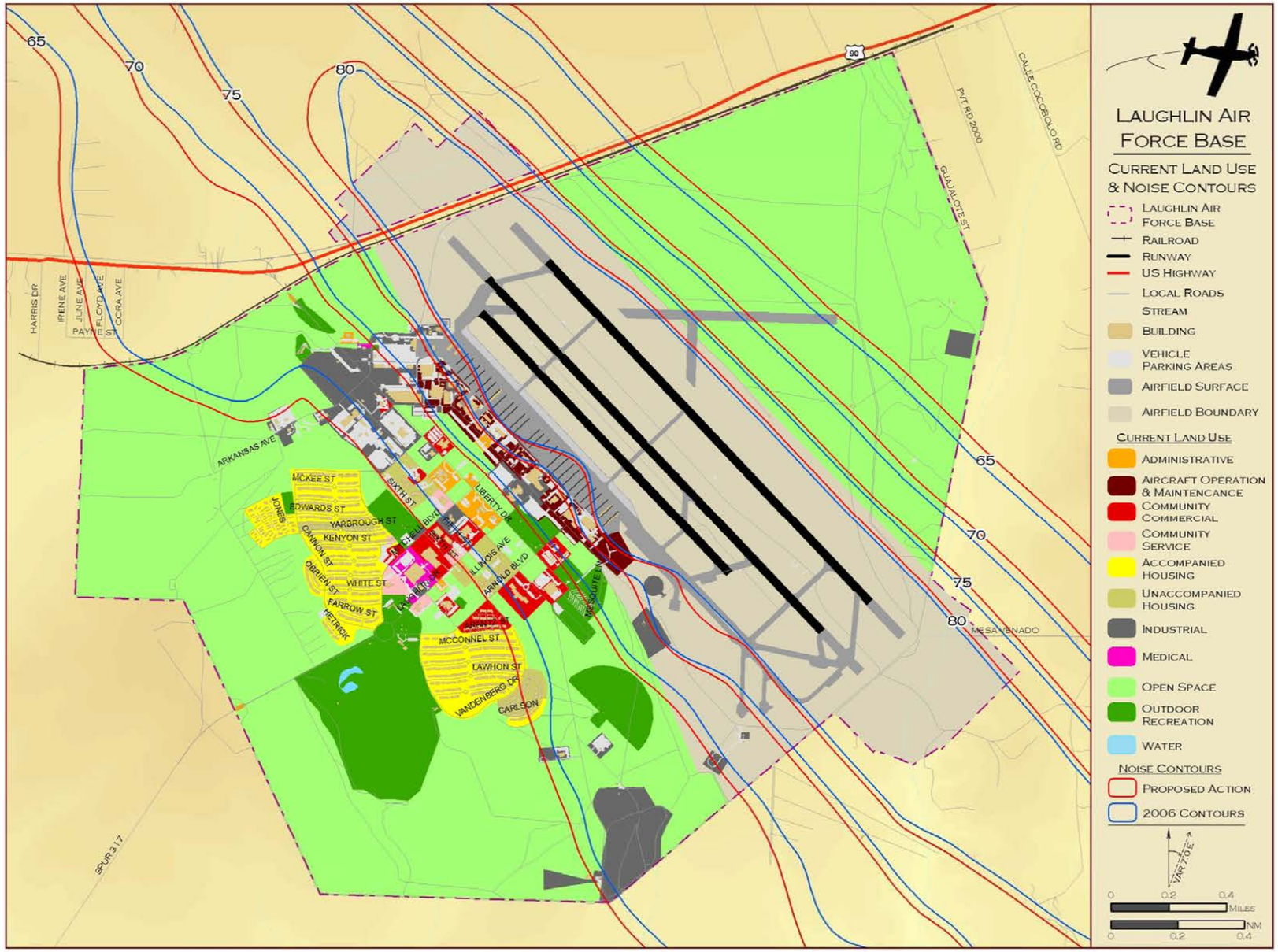
4.3.3.1 Proposed Action

AICUZ

Selection and implementation of this alternative would mean that aircraft operations would increase and with it noise from those operations. Figure 4-3 shows a comparison of the on-base land use with the baseline and Proposed Action noise contours overlaid. With implementation of the Proposed Action it is possible, but not likely, that the increased noise from aircraft operations

may become perceptible to some residents. The 65 dB(A) DNL contour begins to encroach into base housing areas; along the west side of the runway complex. The increase in contour width is largely due to the T-6A Texan II aircraft operations. However, as noted in Table 4-2, a change of less than 3 dB(A) DNL is not ordinarily perceptible. The adverse effects that normally may be anticipated from this action would be mitigated by the ordinary noise attenuation that occurs with modern construction techniques and with specialized interior NLR that would occur by minimizing openings from doorways, windows, chimneys and plumbing vent stacks. The indoor NLR expected from these improvements would be approximately 20 dB(A). Areas around the base would remain subject to noise levels of 65 dB(A) DNL or greater, but land uses generally remain compatible with these levels. Specifically, additional areas of Kinney County that are along the runway extended centerline south east of Laughlin AFB would be enclosed within the 65 dB(A) DNL contour. A review of the 2000 AICUZ report indicates that most of the real estate exposed to a slight increase in DNL is either part of Laughlin AFB, agricultural or open space lands. It was estimated that fewer than 100 residents lived within the 65 dB(A) DNL or greater noise contour. Small portions of the areas experiencing an increase in noise exposure may include residential and commercial land uses. The area surrounding Laughlin AFB is already subjected to flight activity, including regular low-level overflights of military aircraft arriving and departing from the airfield.

Figure 4-3 Comparison of Baseline (FY 2006) and Proposed Action Noise Environment with Current Land Uses



Source: USAF 2006b and USAF 2006c

(no document text this page)

Land use resources would not be negatively impacted under the Proposed Action. The proposed construction would occur in areas designated for such activities in the Laughlin AFB General Plan. The Proposed Action would be compatible with existing land use in the vicinity of the project.

4.3.3.2 Alternative 1 – Potential Development Alternative

With respect to AICUZ, the effects from implementing this alternative would be identical to the Proposed Action since flying operations would be the same. Land development on the installation under this alternative would be more extensive than the Proposed Action but would still be conducted in accordance with the land use planning guidance contained in the General Plan and AICUZ documents therefore the effects from implementing this alternative would be similar to those under the Proposed Action.

4.3.3.3 No Action Alternative

Land use would not be impacted if the No Action alternative were selected. Existing land use patterns and development trends would continue on Laughlin AFB and off base, as described in Section 3.3.3 (Land Use).

4.3.3.4 Mitigative Actions

The Air Force engages in a program of extensive outreach to local communities to facilitate land use planning to foster the establishment of compatible uses in the vicinity of its installations. The AICUZ program at Laughlin AFB is an ongoing process. Upon completion of the beddown activities, an updated study would be prepared and updated noise contours and compatible land use planning recommendations would be furnished to the adjacent municipalities.

4.3.4 Air Quality

The following factors were considered in evaluating air quality: (1) the short- and long-term air emissions generated from operations, renovation, construction, and demolition activities; (2) the type of emissions generated; and (3) the potential for emissions to result in ambient air concentrations that exceed one of the NAAQS. The air pollutant emission calculations for the proposed and alternative actions included in the sections below are detailed in Appendix B.

4.3.4.1 Proposed Action

The facility and infrastructure projects found in Table 2-3 for the Proposed Action would generate heavy equipment and fugitive dust emissions from construction, renovation, and demolition activities. Heavy equipment and fugitive dust emissions were calculated based on emissions factors established by the USEPA (USEPA 1985). Air emissions associated with construction, renovation, and demolition activities for the Proposed Action from FY 2007 through FY 2014 are presented in Table 4-4 as compared to the baseline emission inventories presented in Table 3-7.

Table 4-4 Proposed Action Construction, Renovation, and Demolition Air Emissions

Scenario	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$[d]
Proposed Action FY 2007 (tpy)	0.46	0.03	0.16	0.02	0.78	0.78
Proposed Action FY 2008 (tpy)	3.52	0.38	4.57	0.48	3.73	3.73
Proposed Action FY 2009 (tpy)	1.21	0.09	0.83	0.09	1.73	1.73
Proposed Action FY 2010 (tpy)	0.95	0.15	2.06	0.22	0.51	0.51
Proposed Action FY 2011 (tpy)	13.10	2.08	29.54	3.12	4.47	4.47
Proposed Action FY 2012 (tpy)	1.31	0.18	2.43	0.26	13.77	13.77
Proposed Action FY 2013 (tpy)	5.22	0.79	11.04	1.17	2.27	2.27
Proposed Action FY 2014 (tpy)	0.25	0.05	0.62	0.06	0.22	0.22
Highest Annual Emission Rate for Each Pollutant (tpy)	13.10	2.08	29.54	3.12	13.77	13.77
2004 Laughlin AFB Actual Emissions (tpy)[b,d]	23.7	14.2	9.2	4.5	4.4	4.4
Laughlin AFB Permitted Emissions (tpy)[c,d]	99.5	94	45	10	23.6	23.6
2001 Val Verde County Emissions Inventory (tpy)[a]	14,146	2,726	1,905	152	3,649	912
Highest Annual Emissions as Percent of 2001 Val Verde County Emissions	0.09%	0.08%	1.55%	2.05%	0.38%	1.5%

Notes:
AFB = Air Force Base CO = carbon monoxide NO_X = nitrogen oxides
SO_2 = sulfur dioxide tpy = tons per year VOC = volatile organic compound
$PM_{2.5}$= particulate matter equal to or less than 10 micrometers in aerodynamic diameter
PM_{10} = particulate matter equal to or less than 10 micrometers in aerodynamic diameter
[a] Includes emissions from point, area, on-road, nonroad mobile sources, and biogenic sources for Val Verde County. Source: AIRData; AIRData Information comes from an extract of USEPA's National Emission Inventory (NEI) database. 2001 is the most current AIRData report available.
[b] 2004 actual emissions were obtained from 2004 Air Emission Inventory for Laughlin AFB (USAF 2004a). Emissions from mobile and biogenic sources not included.
[c] Source: USAF 2005h
[d] $PM_{2.5}$ emissions assumed = PM_{10} emissions.

Impacts to air quality from construction, renovation, and demolition activities would be a short-term increase in air emissions that would cease upon completion of the projects. These projects would not be expected to cause long-term impacts to the regional baseline air quality. As seen in Table 4-4, the highest annual emissions from the Proposed Action would not exceed 2.05 percent of the 2001 Val Verde County emissions for any criteria pollutant.

As stated in Section 3.3.4, Laughlin AFB is not required to maintain a mobile source emissions inventory. There would be minor, long-term increases in air emissions associated with privately-owned vehicles (POV) from the additional assigned personnel. These impacts would be minimal as there would be only a 3.5 percent increase in assigned personnel as part of the Proposed Action.

A long-term increase in air emissions associated with the additional aircraft and air operations would be expected as a result of the Proposed Action. The Air Force's Air Conformity Applicability Model (ACAM) (USAF 2005h) was used to estimate emissions from aircraft operations, including ground operations, for both the baseline and Proposed Action aircraft

operations as shown in Tables 2-1 and 2-2. Table 4-5 summarizes the aircraft emissions estimates generated from ACAM.

Table 4-5 Estimated Baseline and Proposed Action Aircraft Air Emissions

Aircraft (Count)	Annual Sorties	CO (tpy)	VOC (tpy)	NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Baseline						
T-6A Texan II (65)	26,905.5	156.63	32.52	51.27	7.48	1.96
T-38C Talon (79)	10,787.4	716.57	46.34	39.67	10.58	18.26
T-1A Jayhawk (52)	12,000.2	113.69	65.74	31.47	4.14	14.3
TOTAL	49,693.1	986.89	144.62	122.41	22.22	34.52
Proposed Action						
T-6A Texan II (79)	32,903.1	191.52	39.77	62.69	9.15	2.39
T-38C Talon (94)	13,034.6	865	55.97	47.87	12.77	22.04
T-1A Jayhawk (52)	12,000.2	113.69	65.74	31.47	4.14	14.3
TOTAL	57,937.9	1,170.21	161.48	142.03	26.06	38.73
Increase	8,244.8	183.32	16.86	19.62	3.86	4.21
Increase as a Percent of 2001 Val Verde County Emissions	--	1.30%	0.62%	1.03%	2.54%	0.12%

Notes:
CO = carbon monoxide NO_X = nitrogen oxides % = percent
SO_2 = sulfur dioxide tpy = tons per year VOC = volatile organic compound
PM_{10} = particulate matter equal to or less than 10 micrometers in aerodynamic diameter

Under the Proposed Action, total emissions from all sources would increase from baseline conditions. However, the increase in emissions would contribute only a small percentage to regional emissions (less that ten percent) and would not be expected to cause the region to exceed the NAAQS. The Proposed Action would occur in an attainment area, would not be subject to a conformity analysis, and would not expose the public or operational personnel to hazardous levels of air pollution.

4.3.4.2 Alternative 1 – Potential Development Alternative

Minor, short-term increases in air emissions associated with the facility and installation development presented in Table 2-4 would occur as a result of similar renovation, construction, and demolition found in the Proposed Action. While this alternative calls for more construction activities than the Proposed Action, the activities would occur over a slightly longer timeframe and the air quality impacts would still be considered short-term and minor. Air emissions associated with construction under Alternative 1 are presented in Table 4-6 below. It is assumed the installation development would occur over a period of ten years; therefore, total emissions are presented as an average annual value over ten years.

Table 4-6 Alternative 1 Construction, Renovation, and Demolition Air Emissions

Scenario	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$[d]
Average Annual Emissions (tpy)	6.5	0.8	10.4	1.1	5.1	5.1
2004 Laughlin AFB Actual Emissions (tpy)[b,d]	22.6	8.3	6.4	0.6	4.1	4.1
Laughlin AFB Permitted Emissions (tpy)[c,d]	99.5	94	45	10	23.6	23.6
2001 Val Verde County Emissions Inventory (tpy)[a]	14,146	2,726	1,905	152	3,649	912
Average Annual Emissions as Percent of Val Verde County Emissions	0.05%	0.03%	0.54%	0.72%	0.14%	0.56%

Notes:
AFB = Air Force Base tpy = tons per year VOC = volatile organic compound
CO = carbon monoxide SO_x = sulfur oxides NO_X = nitrogen oxides
$PM_{2.5}$= particulate matter equal to or less than 10 micrometers in aerodynamic diameter
PM_{10} = particulate matter equal to or less than 10 micrometers in aerodynamic diameter
[a] Includes emissions from point, area, on-road, nonroad mobile sources, and biogenic sources for Val Verde County. Source: AIRData; AIRData Information comes from an extract of USEPA's National Emission Inventory (NEI) database. 2001 is the most current AIRData report available.
[b] 2004 actual emissions were obtained from 2004 Air Emission Inventory for Laughlin AFB (USAF 2004a). Emissions from mobile and biogenic sources not included.
[c] Source: USAF 2005b
[d] $PM_{2.5}$ emissions assumed = PM_{10} emissions.

Air quality impacts from construction, renovation, and demolition activities would be a short-term increase in air emissions that would cease upon completion of the individual projects. These projects would not be expected to cause long-term impacts to the local or regional baseline air quality and would contribute only a small percentage to regional emissions during the period of construction.

Minor, long-term increases in air emissions associated with POV operations as a result of the eight percent increase in assigned personnel would also occur as a part of Alternative 1. These impacts would be slightly greater than those defined under the Proposed Action. Air emissions associated with aircraft operations would be the same as those discussed in the Proposed Action.

Similar to the Proposed Action, total emissions from all sources would increase from baseline conditions under Alternative 1. However, the emissions would contribute only a small percentage to regional emissions, and would not be expected to cause the region to exceed the NAAQS. Alternative 1 would occur in an attainment area, would not be subject to a conformity analysis, and would not expose the public or operational personnel to hazardous levels of air pollution.

4.3.4.3 No Action Alternative

There would be no change to baseline air emissions at Laughlin AFB as a result of the No Action Alternatives.

4.3.4.4 Mitigative Actions

Only minor impacts to local air quality would be expected from the Proposed Action and Alternative 1; therefore, no mitigative actions would be required. BMPs to minimize fugitive dust emissions would include watering the disturbed construction area, covering dirt and aggregate trucks and/or piles, preventing dirt carryover to paved roads, and using erosion barriers and wind breaks.

4.3.5 Earth Resources

4.3.5.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of the Proposed Action and alternatives on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering designs are incorporated into project development.

Analysis of potential impacts on geological resources typically includes:

- Identification and description of resources that could potentially be affected.
- Examination of the Proposed Action and alternatives and the potential effects they may have on the resource.
- Provision of mitigation measures in the event that potentially adverse impacts are identified.

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

4.3.5.2 Proposed Action

Under the Proposed Action, construction activities, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. The soils in the vicinity of the proposed construction projects at Laughlin AFB have been altered over time; and the project area is permanently disturbed with existing facilities and paved roads. Impacts would include an increase in soil erosion and release of fugitive dust emissions that would be minimized through the implementation of BMPs to reduce wind and runoff erosion. Therefore, minor adverse effects on geological resources would be expected from implementation of the Proposed Action.

4.3.5.3 Alternative 1 – Potential Development Alternative

Potential impacts would be similar to those described under the Proposed Action depending on location of the construction. Projects under this alternative could potentially occur in areas of the installation that have not been previously developed; although major changes to topography are

not expected. Therefore, minor adverse impacts would be localized to each site of construction and controlled using BMPs to reduce wind and runoff erosion.

4.3.5.4 No Action Alternative

Under the No Action Alternative, earth resources would not change from the baseline conditions.

4.3.5.5 Mitigative Actions

Should the Proposed Action or Alternative 1 be implemented, mitigation measures would not be needed. However, proposed construction projects should include site-specific sediment and erosion control plans that detail BMPs to prevent soil disturbance, capture and contain loose soil, and slow the movement of storm water during heavy rains. Fugitive dust from construction activities would be minimized by watering and soil stockpiling, thereby reducing the total amount of soil exposed to wind.

4.3.6 Biological Resources

Impacts to biological resources would be considered significant if species or habitats of concern are adversely affected over relatively large areas of their range or disturbances reduced population size or distribution.

It is assumed that the Proposed Action and Potential Development Alternative (Alternative 1) would adhere to management recommendations outlined in the INRMP and avoid development in environmentally sensitive areas such as wetlands, floodplains, and areas of suitable habitat or known locations of threatened and endangered species. Therefore, no direct or indirect impacts to wetlands, floodplains, or endangered species would be expected to occur as a result of the Proposed Action and alternatives. Potential indirect impacts to threatened species are discussed below.

4.3.6.1 Proposed Action

Implementation of the Proposed Action would have minimal effects on the biological resources at Laughlin AFB. The Proposed Action would result in developing approximately 178 acres of open space. The proposed construction and renovation projects would occur within the cantonment area of Laughlin AFB, a previously disturbed area characterized by landscaped areas among buildings, roads and parking areas. Wildlife such as small mammals and birds inhabiting the parts of the cantonment area that would be developed would be expected to relocate to other vegetated areas on or surrounding the base. The rare plant species found on Laughlin AFB are located in undeveloped portions on the installation and not in the area of any proposed construction or demolition activities.

Noise from construction activities, increased traffic, and earth moving would temporarily disturb wildlife near the construction areas. This disturbance is expected to be short-term and minor given the existing noise environment adjacent to an active airfield.

The Devils River minnow, a federally threatened species, is not found on the installation, but could potentially occur in off-base water bodies that receive surface runoff from Laughlin AFB (See Section 3.3.8.1). As a result, this species could be indirectly affected from increased sediment runoff from construction sites. The use of BMPs such as installing silt fences and watering exposed soil would reduce or eliminate potential indirect effects to the minnow and other wildlife downstream from the installation. Silt fences would reduce sediment runoff at construction sites and protect the integrity of the water quality in the area. Watering exposed soil would reduce dust in the area and minimize or eliminate the potential air quality impacts to local wildlife. To reduce potential long-term effects of runoff from increased impervious surfaces, project designs would be consistent with the installation SWPPP.

4.3.6.2 Alternative 1 – Potential Development Alternative

This alternative proposes to develop 889 acres (approximately 40 percent) of the current open space that is not considered an environmentally sensitive area such as wetlands, floodplains, and areas of suitable habitat or known locations of threatened and endangered species. Development activities would adhere to management recommendations outlined in the INRMP. It should be noted that the intensity of proposed development varies. Of the 889 acres of open space developed, 561 acres would be reclassified to Airfield land use and 94 acres would be reclassified to Recreational land use. Both of these land uses represent historically lower intensity development that would still be capable of supporting some wildlife. Wildlife present in other more intensely-developed land uses would relocate to other areas on or off the installation. The vegetation and wildlife communities at Laughlin AFB are typical of those surrounding the installation and throughout Val Verde County, which is largely undeveloped. Loss of these areas would not affect wildlife populations common in these communities.

Biological surveys at the installation conducted in 1995 did not find any threatened or endangered species; however, two rare plant species were identified. Known locations of these plants would be avoided and pre-construction surveys would be done in those areas with appropriate habitat to ensure protection of these plants.

4.3.6.3 No Action Alternative

Implementation of the No Action Alternative would not change the baseline environment for Biological Resources discussed in Section 3.3.6.

4.3.6.4 Mitigative Actions

The last documented biological survey of the installation was done in 1995. If Alternative 1 were implemented, it would be recommended that the project areas be surveyed for suitable habitat or locations of threatened, endangered, or species of concern prior to site planning or ground disturbance. If species of concern are found within the project areas, consultation with USFWS should occur. For both the Proposed Action and Alternative 1, BMPs would be used at construction sites to reduce sediment runoff to habitat found in receiving waters.

4.3.7 Cultural Resources

Significant impacts to cultural properties would occur only if the proposed or alternative actions would adversely affect historic properties. An adverse effect is an undertaking that diminishes the integrity of a property's location, design, setting, materials, workmanship, feeling, or association. An adverse effect can occur through the destruction or alteration of the property, isolation from or alteration of the environment, introduction of intrusive elements (visual, audible, or atmospheric), neglect, and the transfer, lease, or sale of the property (ACHP 1995).

The nature and potential significance of cultural resources in the potentially affected areas were identified by considering the following definition: historic properties, under 36 CFR Part 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP." For the purpose of these regulations this term includes artifacts, records, and remains that are related to and located within such properties. The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet NRHP-listing criteria.

4.3.7.1 Historic Resources

4.3.7.1.1 Proposed Action

The Proposed Action would involve demolition of building and structure numbers 255, 256, 280, 282, 284, 339, 348, 351, 460, 461, 462, 463, 472, and 494, and the addition or alteration to building and structure Nos. 52, 53, 201, Hangar 2 (Building 210), 241, 320, 328, 380, 390, 413, 476, 502, and 950. The Proposed Action would also include new construction on the Main Base.

The Proposed Action would have no effect on historic properties. The buildings and structures proposed for demolition or alteration are not eligible for listing in the NRHP. Twenty of the buildings and structures are less than fifty years of age and do not meet the qualifications for exceptional importance under Criterion Consideration G. The remaining 7 buildings and structures lack integrity in design, setting, materials, feel, and association. Furthermore, they do not hold historical or architectural significance, and thus, do not meet the requirements for listing in the NRHP under Criteria A, B, C, or D.

4.3.7.1.2 Alternative 1 – Potential Development Alternative

Alternative 1 would have no effect on historic properties. This alternative calls for a broader approach to installation development but it is assumed the same buildings and structures proposed for demolition or alteration in the Proposed Action would be included in this alternative.

4.3.7.1.3 No Action Alternative

Under the No Action Alternative, there would be no demolition or construction activities or change from the baseline condition; and therefore, no adverse effect on historic properties.

4.3.7.1.4 Mitigative Actions

There would be no adverse impacts to historic properties as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.7.2 Archeological Resources

4.3.7.2.1 Proposed Action

Based on previous studies of the installation, the proposed construction on the Main Base would be expected to have no effect on archeological resources. Additionally, there is a low potential to identify or discover any new or unknown sites during construction or demolition activities as investigations have indicated that the areas have been disturbed and exhibit no potential for intact deposits.

4.3.7.2.2 Alternative 1 – Potential Development Alternative

Based on previous studies of the installation, the proposed construction on the Main Base would be expected to have no effect on archeological resources. Additionally, there is a low potential to identify or discover any new or unknown sites during construction or demolition activities as investigations have indicated that the areas have been disturbed and exhibit no potential for intact deposits.

4.3.7.2.3 No Action Alternative

Under the No Action Alternative, there would be no demolition or construction activities or change from the baseline condition; and therefore no adverse effect on archeological properties.

4.3.7.2.4 Mitigative Actions

Impacts to archeological resources would not be expected from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.8 Water Resources

Impacts to surface water and groundwater resulting from the proposed or alternative action may occur if project activities resulted in the following:

- Surface water quality declining such that the existing surface water quality standards would be violated.
- An increase in water usage from the San Felipe Springs so that users downstream would be impacted.

4.3.8.1 Surface Water

4.3.8.1.1 Proposed Action

The actions associated with the Proposed Action that have the potential to impact surface water resources are: demolition activities, shallow excavation, paving, and construction activities. The potential for increased sediment loading of surface water during the initial demolition and construction activities is the most likely impact associated with the Proposed Action. This potential impact would be short-term and manageable through implementation of a SWPPP along with the incorporation of BMPs for sediment control during construction. Implementation of these actions would minimize potential water quality problems.

Based upon Table 2-3, the Proposed Action would result in an increase of 1,017,385 square feet of impervious cover associated with the proposed construction projects. This represents an approximately seven percent increase in impervious cover (334.6 acres of existing impervious cover per Table 2-4) on the installation. This increase of impervious cover would result in an increase of surface water runoff during rain events, approximately 667,988 gallons of runoff per inch of rain, which would be equivalent to 24.60 cubic feet per second of water entering into the storm water system[*]. The increased runoff has the potential to increase sediment loads within the water bodies. Under the Proposed Action, upgrading the storm drain system would be a component of the action. The increase in sediment loads should be maintained and managed by the proper implementation of the base wide SWPPP.

Seven of the individual projects under the Proposed Action, would be expected to disturb over one acre of soil. Each of these projects would require a Notice of Intent (NOI) under the Texas Construction General Permit, TXR15000, to be filed with the TCEQ and the creation and implementation of a site specific SWPPP.

4.3.8.1.2 Alternative 1 – Potential Development Alternative

Impacts for Alternative 1 would be similar to those described for the Proposed Action except for the increase in construction and facility space would result in an increase of 5,719,428 square feet (See Table 2-4) of impervious cover. This represents a 40 percent increase in installation impervious cover. This development would increase the amount of surface runoff in the long term and could result in a short-term increased sediment runoff during construction activities. As with the Proposed Action, it is assumed expansion of the installation stormwater collection system would occur under this alternative. The increase in sediment loads should be maintained and managed by the proper implementation of the base wide SWPPP. Implementation of this alternative would not have long-term adverse impacts on surface water quality or quantity on Laughlin AFB or downstream surface water bodies.

[*] 24.60 cubic feet per second is based upon the Rational Method, using 0.90 as the runoff coeffient and 1.17 inches of rain/hour

4.3.8.1.3 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.8.1.

4.3.8.1.4 Mitigative Actions

In order to minimize the potential for increased total suspended solids in downstream surface water bodies, the base wide SWPPP, and where necessary construction-site specific SWPPPs should be implemented. No other mitigative actions would be required due to absence of long-term adverse impacts to surface water quality or quantity.

4.3.8.2 Groundwater

4.3.8.2.1 Proposed Action

Implementation of the Proposed Action would not impact the quality or quantity of groundwater at Laughlin AFB or the surrounding area. Groundwater beneath the subject property is anticipated to be approximately 40 feet below ground surface (bgs). Excavation for any construction and demolition activities is not expected to reach probable groundwater levels. As a result, groundwater is not likely to be encountered. If groundwater were encountered, care would be taken during construction activities to ensure that groundwater resources would be protected from contamination. Likewise, in the event groundwater is encountered during any construction or demolition activities, care would be taken during construction activities to ensure that workers are protected from potentially contaminated groundwater.

4.3.8.2.2 Alternative 1 – Potential Development Alternative

Impacts for this Alternative 1 would be the same as those described for the Proposed Action.

4.3.8.2.3 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.8.2.

4.3.8.2.4 Mitigative Actions

There would be no adverse impacts to groundwater resources as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required. As mentioned above, if groundwater is encountered during construction activities, care would be taken during construction and demolition activities to ensure that groundwater resources are protected from contamination.

4.3.8.3 Floodplains

4.3.8.3.1 Proposed Action

The Proposed Action activities would not be located within the floodplains as described in Section 3.3.8.3. Since the activities would not be located within the floodplains, there would be no impact to this resource.

4.3.8.3.2 Alternative 1 – Potential Development Alternative

The installation development under Alternative 1 would not occur in the floodplains; therefore, there would be no impact to this resource.

4.3.8.3.3 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.8.3.

4.3.8.3.4 Mitigative Actions

There would be no adverse impacts to floodplains as a result of the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.9 Hazardous Substances

The degree to which proposed construction and demolition activities could affect the existing environmental management practices was considered in evaluating potential impacts to hazardous materials and wastes, including ERP sites. Impacts could result if nonhazardous regulated or hazardous substances were collected, stored and/or disposed of improperly or if the volume of waste material exceeded the current management capacity of the installation.

4.3.9.1 Proposed Action

4.3.9.1.1 Hazardous Materials

The use of hazardous materials during the implementation of the Proposed Action is expected to be limited to construction vehicle maintenance (fuel, oils, and lubricants) activities, construction materials (adhesives, sealants, etc.), and additional aircraft maintenance activities (fuel, oils, lubricants, corrosion removers, and paint). These materials would be required to be properly contained, manifested, and managed in accordance with all federal, state, and local regulations, AFIs, and DoD Directives. Authorization from Laughlin AFB Environmental Flight would need to be acquired prior to use of hazardous materials.

4.3.9.1.2 Asbestos

ACM is potentially present in all buildings. The guidelines present in the Laughlin AFB Asbestos Management Plan would be followed to abate all ACM from the affected facilities prior to demolition activities. A positive long-term positive impact would occur, due to

renovation activities removing ACM currently present. No ACM would be used in the construction of any new facilities.

4.3.9.1.3 Lead-Based Paint

LBP must be considered to be present in all facilities constructed prior to 1980. Procedures stated in the *Laughlin AFB LBP Management Plan* would be followed to properly test and manage facilities that have been found to contain LBP. Areas where LBP has been abated or not found should still be regarded as possibly containing LBP. LBP may be present within the soils surrounding the facilities. If it is necessary to remove soils for off-site disposal, a limited number of random samples would be collected to assess the presence or absence of lead in soil, and to property categorize the soil for hazardous constituents per applicable state and federal regulations for disposal offsite. Long-term impacts resulting from this alternative would be positive in the removing of LBP and LBP contaminated soils.

New personnel and associated family members would need to be informed of the potential presence of LBP within current MFH located at Laughlin AFB prior to their residency.

4.3.9.1.4 Pesticides

Currently, Laughlin AFB pest management applies commercially available pesticides. Base records indicate the historical application of several pesticides that are no longer approved for use. Although these pesticides were used in accordance with manufacturers' guidance and directions, the potential exists for residual concentrations in the soil underlying on-base facilities. If it is necessary to remove soils for off-site disposal, a limited number of random samples would be collected to assess the presence or absence of pesticides in soil, and to properly categorize the soil for hazardous constituents per applicable state and federal regulations for disposal off site. Long-term impacts resulting from the Proposed Action would be positive in the removing of pesticide contaminated soils, if contaminated soils are found.

4.3.9.1.5 Hazardous Waste

Additional regulated wastes would be generated by the 15 percent increase in aircraft maintained and operated on Laughlin AFB. During demolition activities, associated with the Proposed Action, any ACM- and LBP-containing materials removed would be managed in accordance with established installation management plans and state and federal regulations. LBP-containing materials would qualify for household hazardous waste exemption and would be treated as C&D wastes. As described in Section 4.3.9.1.4, a limited number of soil samples should be collected to ascertain the presence or absence of pesticides and lead so that any excess soil may be disposed of in accordance with applicable state and federal regulations. The additional hazardous wastes generated by the increase in aircraft would be regulated under the *Laughlin AFB Hazardous Waste Management Plan* and would be handled, packaged, stored, and disposed of as stated in the plan. No negative short- or long-term impacts resulting from this alternative were identified. Positive impacts would include the proper disposal of abated LBP, ACM, and LBP and/or pesticide contaminated soils decreasing potential human contact with those materials.

4.3.9.1.6 Environmental Restoration Program

As described in Section 3.3.9, there are 20 ERP sites and four AOCs within one-half mile of proposed demolition and construction activities. Of these 20 ERP sites, 12 are closed or pending closure with no further action required. Proposed construction and demolition activities are not expected to impact any active ERP sites or AOCs. It is unlikely that construction activities under the Proposed Action would encounter groundwater. If groundwater is encountered, during construction activities related to the Proposed Action, care would be taken during construction activities to ensure that groundwater resources and human health are protected from potentially contaminated groundwater.

4.3.9.2 Alternative 1 – Potential Development Alternative

Under Alternative 1, the impacts would be the same as those described for Proposed Action, except that additional aircraft maintenance and industrial facilities could be constructed resulting in an increase in the hazardous waste stream. Also, under Alternative 1, exact locations of proposed construction sites are unknown; however, ERP sites and AOCs were excluded from the area subject to development.

4.3.9.3 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.9.

4.3.9.4 Mitigative Actions

Impacts with regard to hazardous materials and wastes would not be expected from the proposed activities. All hazardous materials and wastes would be managed according to established plans and state and federal regulations. Therefore, no mitigative actions would be required.

Impacts with regard to the ERP sites would not be expected from the proposed activities. As noted above, in the unlikely event groundwater was encountered, care would be taken during demolition and construction activities to ensure that groundwater resources are protected from contamination. Likewise, in the event groundwater is encountered during new construction, care would be taken during construction activities to ensure that workers are protected from contaminated groundwater. Per the ERP Management Action Plan, if work is to be conducted near FT005, the Environmental Flight office should be contacted prior to any construction activities.

4.3.10 Safety

4.3.10.1 Proposed Action

Aircraft Safety. Under the Proposed Action, annual hours flown for T-6 and T-38C would increase by 22 and 21 percent. Based on the mishap rates for these aircraft, the frequency of a Class A or B mishap for the T-6A would increase from one every 2.76 years to one every 2.26 years. For the T-38C, aircraft mishaps would be expected to increase from one every 7.24 years

to one every six years, although continued implementation of the installation flying safety program could reduce the mishap rates for both aircraft.

BASH. An increase in flying operations at Laughlin AFB would also increase the risk of a bird/wildlife-aircraft strike; however, continued implementation of the 47th FTW BASH Plan would minimize conditions giving rise to incidents involving birds and wildlife.

Explosive Safety Zones. The Proposed Action includes the alteration of Building 950 and the construction of additional munitions cubes at this location. Depending upon the amount of additional explosives to be stored, the QD arcs for these facilities may require expansion. These facilities would be located in a relatively remote area of the installation and are not expected to create any land use incompatibilities. It should also be noted that modernization of existing munitions storage facilities through these projects could improve the safety of munitions storage.

Construction Safety. Short-term, minor adverse effects would be expected due to the temporary increase in construction activities on the installation. Construction contractors would be required to establish and maintain safety programs that would provide protection to their workers and limit the exposure of base personnel to construction hazards.

4.3.10.2 Alternative 1 – Potential Development Alternative

Under Alternative 1, flying operations would be the same as the Proposed Action therefore impacts to safety would the same as those presented under the Proposed Action. Under Alternative 1, short-term, minor safety impacts would be slightly higher than the Proposed Action due to the increased amount of construction.

4.3.10.3 No Action Alternative

Under the No Action Alternative, conditions would remain at the baseline condition at Laughlin AFB. No impacts to safety at Laughlin AFB would be expected.

4.3.10.4 Mitigative Actions

Mitigation measures would not be needed under the Proposed Action or alternative actions. Laughlin AFB would continue its Ground and Flight Safety programs to ensure that all installation operations are conducted in the safest manner possible. Construction contractors would be required to develop and implement safety plans for each construction project.

4.3.11 Utilities and Infrastructure

Under the Proposed Action, an additional 178 full-time military and civilian personnel would be assigned to Laughlin AFB. The distribution of military versus civilian, and accompanied versus unaccompanied is unknown. For purposes of calculating additional utilities consumption, generation, and traffic counts, a conservative approach was taken which assumes that all personnel would be accompanied by 1.45 dependents per person (calculated value of current dependents per person at Laughlin AFB), totaling 258 dependents. This would result in a total increase of 436 persons at Laughlin AFB as a result of the Proposed Action.

Under Alternative 1, 410 full-time personnel would be assigned to Laughlin AFB; using this methodology, it is assumed that 256 would be unaccompanied and 154 would be accompanied. Assuming 1.45 dependents per accompanied person, there would be an additional 223 dependents arriving as a result of Alternative 1. This would result in a total increase of 633 persons at Laughlin AFB as a result of Alternative 1. For dependents under both the Proposed Action and Alternative 1, it is assumed that there is one spouse per military personnel, with the remaining dependents assumed to be children.

Additionally, due to uncertainties in the distribution of military versus civilian, a worst-case approach was taken with respect to utilities by assuming all incoming personnel would be 24-hour residents.

4.3.11.1 Potable Water

4.3.11.1.1 Proposed Action

Implementation of the Proposed Action would result in a minor, long-term increase in potable water consumption. An additional 436 personnel and dependents would result in an annual increase in potable water consumption by approximately 53 million gallons, or 16.8 percent. There is currently sufficient capacity at Laughlin AFB to accommodate this increase in potable water consumption.

4.3.11.1.2 Alternative 1 – Potential Development Alternative

Impacts for Alternative 1 would be the same as the Proposed Action, except that potable water consumption would increase by approximately 77 million gallons, or 24.5 percent, due to the addition of 633 personnel and dependents.

4.3.11.1.3 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.11.1.

4.3.11.1.4 Mitigative Actions

There would be no adverse impacts to potable water as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.11.2 Sanitary Sewer

4.3.11.2.1 Proposed Action

An additional 436 personnel and dependents would result in a minor, long-term annual increase in wastewater generation of approximately 33,000 gallons daily, or 17 percent. Currently, Laughlin AFB could accommodate a 163 percent increase in wastewater generation; therefore there is sufficient capacity to accommodate the 17 percent increase in wastewater generation that would be associated with the Proposed Action.

4.3.11.2.2 Alternative 1 – Potential Development Alternative

Impacts for Alternative 1 would be the same as the Proposed Action, except the daily wastewater generation would increase by approximately 47,000 gallons, or 24.3 percent, due to the addition of 633 personnel and dependents.

4.3.11.2.3 No Action Alternative

Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.11.2.

4.3.11.2.4 Mitigative Actions

There would be no adverse impacts to the sanitary sewer system as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.11.3 Solid Waste

The following factor was considered in evaluating potential impacts to solid waste management: the degree to which proposed construction, changes in operation, and the potential for generated additional waste could affect the existing solid waste management program and capacity of the area landfills. The solid waste generated during construction activities would consist of materials such as solid pieces of concrete and asphalt, metals, and lumber. The contractor would be responsible for disposing of solid waste in accordance with all federal, state, and local laws.

4.3.11.3.1 Proposed Action

Construction, renovation, and demolition activities associated with the Proposed Action would result in an increase in solid waste generated at Laughlin AFB. It is assumed that all projects would be completed within one year of their start and that generation of solid waste would be spread out over each year of construction. Table 4-7 shows the estimated C&D waste that would be generated as a result of construction, renovation, and demolition activities associated with the Proposed Action. Table 4-8 shows the estimated amount (in tons) of additional C&D waste which would be generated each year of the Proposed Action.

Table 4-7 Solid Waste Generation from Construction, Renovation, and Demolition Activities Associated with the Proposed Action

Fiscal Year of Project	Project Description	Area Affected (SF)	Rate of Debris (lb/SF) [a]	Estimated Solid Waste Generated from Action (Tons)
2007	Add/alter by expanding the existing Aerospace Physiology facility	1,206	24.05	14.50
2007	Add/alter by expanding the existing Child Development Center facility	1,206	24.05	14.50
2007	Add/alter by expanding the tool room in the Hangar 2 maintenance facility	750	24.05	9.02
2007	Construct an additional munitions cube in the existing ammunition storage area	120	3.89	0.23
2007	Add/alter munitions storage to include four additional storage cubes.	480	24.05	5.77
2007/2008	Construct a 55 person, Unaccompanied Officers Quarters to house new mission personnel.	39,073	3.89	76.00
2007/2008	Add/alter Student Training Complex, Anderson Hall by expanding the existing student complex	10,473	24.05	125.94
2007/2008	Add/alter by expanding the existing Non-Destructive Inspection facility	3,251	24.05	39.09
2007/2008	Add/alter by expanding the existing simulator facility.	3,218	24.05	38.70
2007/2008	Add/alter by expanding the existing fuel systems maintenance facility.	3,305	24.05	39.74
2007/2008	Add/alter Aircraft by expanding the existing Aircraft Weather Shelter.	13,735	24.05	165.16
2007/2008	Add/alter Egress Shop.	3,660	24.05	44.01
2007/2008	Expand Flight Line Shack	600	24.05	7.22
2008/2009	Construct a Gasmask Confidence Chamber for military personnel to ensure proper fit and wear of the mask in a chemical environment. Facility would allow for the release of tear gas and camphor.	180	3.89	0.35
2008/2009	Build facility to house the Office of Special Investigations currently located in one section of Building 339.	4,500	3.89	8.75
2008/2009	Base Theater Demolition	5,000	155	387.50
2009/2010	Construct an addition to Building 241 for communications.	16,000	24.05	192.40
2009/2010	Communications Facility Demolition	11,000	155	852.50
2010	Temporary Living Facilities Demolition, Bldg. 461	2,000	155	155.00
2010	Temporary Living Facilities Demolition, Bldg. 462	3,000	155	232.50
2010	Temporary Living Facilities Demolition, Bldg. 463	3,000	155	232.50
2011	Expand Main Gate and West Gate, and relocate the north part of the Main Gate Air Park to south of the Main Gate.	303,360	24.05	3,647.90

Table 4-7 Solid Waste Generation from Construction, Renovation, and Demolition Activities associated with the Proposed Action (Continued)

Fiscal Year of Project	Project Description	Area Affected (SF)	Rate of Debris (lb/SF) [a]	Estimated Solid Waste Generated from Action (Tons)
2011/2012	Build a water tower to replace existing two towers. The location of the new tower would be adjacent to the existing towers to ease connection to the existing water distribution system.	4,000	3.89	7.78
2011/2012	Construct New Physiological Training Facility	10,764	3.89	20.94
2011/2012	Build a new facility to house telephone switching functions and to replace Building 339. The site would be close to the current facility due to the requirement to attach to the current telephone infrastructure.	5,000	3.89	9.73
2011/2012	Communications Facility Demolition	6,000	155	465.00
2011/2012	Physiological Training Demolition	9,000	155	697.50
2012	Addition to Youth Center to include an enclosed basketball court.	7,280	24.05	87.54
2012	Expand the Golf Course. Ample open space is located adjacent to the existing nine-hole course to allow the development of an additional nine-holes. Expansion would be to the west and southwest of the existing golf course.	NA	NA	NA
2012	Redesign Parking and Construct Pedestrian Walkway	3,300	24.05	39.68
2012/2013	Construct a new facility to house enlisted personnel supporting the current mission. The current dormitories, Buildings 255 and 256, were constructed in 1983 and 1984 respectively. Due to their age and usage they can no longer be cost effectively renovated to comply with the new dormitory standards. New dormitory would be located in vicinity of the existing enlisted dormitories.	75,347	3.89	146.55
2012/2013	Construct a collocated club. The collocated club would replace Buildings 472, 284, and 494. The new club would be constructed adjacent to the golf course for ease of multi-use and greatly improve the quality of life for the base populace.	37,000	3.89	71.97
2013/2014	Club XL Demolition	17,000	155	1,317.50
2013/2014	Club Amistad Demolition	10,000	155	775.00

Notes:
SF = square feet NA = Not Applicable
lb/SF = pounds per square foot
[a] USEPA 1998. Estimated non-residential construction debris rates, as reported in the *Characterization of Building-Related Construction and Demolition Debris in the United States*, are 3.89 lbs/SF, and non-residential demolition rates are estimated to be 155 lbs/SF. Demolition debris rate include concrete slabs. Non-residential renovation debris rates were unavailable; however, the *Characterization of Building-Related Construction and Demolition Debris in the United States* states that, based on the assumption that for non-residential renovation, waste generation per dollar is equal to the residential rate, total non-residential renovation is less than the residential generation by the ratio of dollars spent. Therefore, for purposes of this analysis, the rate of debris generated for residential renovation (24.05 lbs/SF) was used for non-residential renovation.

Table 4-8 Estimated Additional Solid Waste Generated Per Year of Proposed Action

Fiscal Year [a]	Construction Debris Generated (Tons)	Renovation Debris Generated (Tons)	Demolition Debris Generated (Tons)	Total Debris Generated (Tons)
2007	38.23	273.72	0	311.95
2008	42.55	229.93	193.75	466.23
2009	4.55	96.2	620	720.75
2010	0	96.2	1,046.25	1,142.45
2011	19.23	3,647.9	581.25	4,248.38
2012	128.49	127.22	581.25	836.96
2013	109.26	0	1,046.25	1,155.51
2014	0	0	1,046.25	1,046.25
Total	**342.30**	**4,471.17**	**5,115.00**	**9,928.47**

Notes:
[a] For projects which would occur over two years, the amount of debris generated for that project was divided equally between the two years.

Based on the estimated rates indicated in Table 4-8, approximately 9,928 tons of C&D waste would be generated over the 8 year period of the Proposed Action. Since Laughlin AFB does not keep records of the amount of C&D waste generated annually, the percent increase as a result of the Proposed Action can not be determined.

As a result of an additional 178 full-time military and civilian personnel and their families (436 persons total) at Laughlin AFB, there would also be a long-term minor increase in administrative solid waste generated at newly constructed facilities, as well as a long-term minor increase in municipal solid waste generated in the local area. Based on the current per capita rate of municipal solid waste generation, it is estimated that an additional 388,302 pounds (194.2 tons) of municipal solid waste would be generated annually as a result of the Proposed Action.

The Del Rio Municipal Landfill currently receives approximately 62,600 tons of solid waste per year. By combining municipal solid waste and C&D waste generated as a result of the Proposed Action, annual increases in the amount of solid waste disposed of at the Del Rio Municipal Landfill would range from 0.8 percent to 7.1 percent over the time period of the Proposed Action. This is a conservative estimate since this range does not account for any materials which would be recycled. These would be short-term, minor increases. Since the Del Rio Municipal Landfill has a remaining life expectancy of 15 years with plans to expand the landfill, there would be sufficient capacity to handle the short-term increase in solid waste.

4.3.11.3.2 Alternative 1 – Potential Development Alternative

Under Alternative 1, there would be approximately 12,065 tons of C&D waste generated from construction of 1,003,296 square feet of facilities. Assuming that demolition activities described in the Proposed Action also occur under Alternative 1, an additional 5,115 tons of C&D waste would be generated, for a total of 17,180 tons. It is assumed for the purposes of this analysis that the generation of this solid waste would be distributed over ten years. This equates to an annual generation of 1,718 additional tons of solid waste.

Impacts to administrative and municipal solid waste would be the same as the Proposed Action, except that 721,007 pounds (360.5 tons) of municipal solid waste would be generated annually as a result of Alternative 1.

Impacts to the Del Rio Landfill would be short-term and minor. By combining municipal solid waste and C&D waste generated as a result of Alternative 1, annual increases in the amount of solid waste disposed of at the Del Rio Municipal Landfill would be approximately 28 percent.

4.3.11.3.3 No Action Alternative

Under the No Action Alternative, there would be no change to the baseline conditions described in Section 3.3.11.3.

4.3.11.3.4 Mitigative Actions

There would be no adverse impacts to solid waste as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.11.4 Drainage

4.3.11.4.1 Proposed Action

As a result of the Proposed Action, there would be an increase of approximately one million square feet, or 23 acres of impervious cover at Laughlin AFB. This would include additional impervious cover associated with facility additions, new construction, and additional paved areas. Construction, renovation, and demolition activities would require excavation and disturbance of areas currently stabilized with grass or pavement, and may require installation of utility lines beneath roadways, parking lots, and sidewalks.

For each project site greater than one acre, a TPDES Construction General Permit, as well as a SWPPP would be required. In addition, for sites which would disturb more than five acres, the contractor would also be required to pay an annual Water Quality Fee, as well as submit an NOI to the TCEQ. Any short-term impacts to drainage would be mitigated by implementation of the SWPPP.

4.3.11.4.2 Alternative 1 – Potential Development Alternative

Under Alternative 1, there would be an increase of approximately 5.7 million square feet, or 131 acres of impervious cover at Laughlin AFB. The impacts associated with this increase, as well as the requirement for SWPPPs and permits would be similar to those defined for the Proposed Action.

4.3.11.4.3 No Action Alternative

Under the No Action Alternative, there would be no change to the baseline conditions described in Section 3.3.11.4.

4.3.11.4.4 Mitigative Actions

There would be no adverse impacts to drainage as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.11.5 Transportation

4.3.11.5.1 Proposed Action

There would be a minor, long-term increase in traffic counts on the installation and in the local area resulting from the addition of 436 personnel and dependents to Laughlin AFB. There would also be an additional minor, short-term increase in traffic counts associated with a variety of tradespersons entering the installation on a daily basis to accomplish construction, renovation, and demolition activities. Increased traffic counts would be expected in the early morning hours as workers arrive at their job site and in the early evening as workers depart for the day. This would typically coincide with the normal commuting patterns of Laughlin AFB occupants who work similar hours. Under the Proposed Action, insufficient conditions currently existing at the Main Gate (USAF 2002b) would be corrected through an expansion of that gate. The West Gate at Laughlin AFB would also be expanded. These two projects would provide long-term positive impacts to traffic flow at installation entry points.

Transportation of heavy equipment, materials, and roll-off dumpsters to and from the construction locations would add additional short-term traffic on the installation and on public roads that connect to the installation. The heavy loads that would be expected from this type of traffic could adversely affect road surface conditions if the roadway section is not adequate to support continued heavy equipment traffic for an extended period. Repair of small roadway sections may be required following completion of the construction projects.

4.3.11.5.2 Alternative 1 – Potential Development Alternative

Impacts for Alternative 1 would be the same as the Proposed Action, except that there would be an addition of 633 personnel and dependents contributing to the minor, long-term increase in traffic counts. Also, additional construction activities would occur under Alternative 1, which would increase the wear of road surfaces. It is likely that expansion of the Main Gate and West Gate would occur under Alternative 1; therefore, impacts to traffic flow would be the same as the Proposed Action.

4.3.11.5.3 No Action Alternative

Under the No Action Alternative, there would be no change to the baseline conditions described in Section 3.3.11.5.

4.3.11.5.4 Mitigative Actions

There would be no adverse impacts to transportation as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.11.6 Electricity/Natural Gas

4.3.11.6.1 Proposed Action

Implementation of the Proposed Action would cause minor, long-term increases in overall electrical and natural gas consumption on Laughlin AFB due to the addition of personnel, dependents, and facilities. For purposes of this analysis, it is assumed that the per capita values of electricity and natural gas consumption identified in Chapter 3 include facility consumption of these utilities. An additional 436 personnel and dependents would result in an increase in electrical consumption of approximately 20,056 MWh per day, or 17 percent. Natural gas consumption would also increase by approximately 26 kcf per day, or 17 percent. These increases are well within the capacity of the existing utility systems.

4.3.11.6.2 Alternative 1 – Potential Development Alternative

Impacts for Alternative 1 would be the same as the Proposed Action, except that there would be an electrical consumption increase of approximately 29,118 MWh per day, or 25 percent, and a natural gas consumption increase of approximately 38 kcf per day or 25 percent.

4.3.11.6.3 No Action Alternative

Under the No Action Alternative, there would be no change to the baseline conditions described in Section 3.3.11.6.

4.3.11.6.4 Mitigative Actions

There would be no adverse impacts to electricity/natural gas consumption as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.3.12 Socioeconomic Resources

The analysis below for socioeconomic resources is based on the following assumptions:

Population. Under the Proposed Action, an additional 178 full-time military and civilian personnel would be assigned to Laughlin AFB. The distribution of military versus civilian, and accompanied versus unaccompanied is unknown. For purposes of analysis, a conservative

approach was taken which assumes that all personnel would be accompanied by 1.45 dependents per person (calculated value of current dependents per person at Laughlin AFB), totaling 258 dependents. This would result in a total increase of 436 persons at Laughlin AFB as a result of the Proposed Action.

Under Alternative 1, 410 full-time personnel would be assigned to Laughlin AFB. It is assumed that 256 would be unaccompanied and 154 would be accompanied. Assuming 1.45 dependents per accompanied person, there would be an additional 223 dependents arriving as a result of Alternative 1. This would result in a total increase of 633 persons at Laughlin AFB as a result of Alternative 1. For dependents under both the Proposed Action and Alternative 1, it is assumed that there is one spouse per military personnel, with the remaining dependents assumed to be children.

Housing. Since the distribution of accompanied and unaccompanied personnel under the Proposed Action is not known, it is assumed that all 178 full-time personnel would be accompanied.

Education. New families assigned to Laughlin AFB would enroll their children in the San Felipe Del Rio CISD. It is assumed that elementary age children would be enrolled at Ruben Chavira Elementary School.

Economy. Under the Proposed Action, construction, renovation, and demolition of facilities would begin in 2007 and would be completed by 2014. Table 2-3 indicates when each project is projected to begin and for purposes of analysis, it is anticipated that each project would be completed in the year in which it begins. Due to this schedule, economic impacts associated with construction would be expected to vary as the construction periods begin and end.

4.3.12.1 Proposed Action

Population. There would be an approximate one percent increase in the 2000 Val Verde County population due to the addition of 178 full-time military and civilian personnel and approximately 258 dependents. This would result in a minor, long-term impact to the population in the local community.

Housing. If MFH is available on base at time of arrival, military personnel and their families would live on base. When on-base MFH is no longer available, arriving military personnel and their families would be required to live off base. There are projected to be approximately 215 suitable vacant rental units within the housing market area in 2007 (USAF 2003c). This would accommodate all military personnel and families; therefore, there would be no impacts to housing for military personnel and families. This would, however, result in a decrease in off-base housing units available to the general public; therefore, there would be a minor long-term impact on housing for the general community. This impact would become short term if the commercial housing market responded with additional construction.

Education. There would be a long-term increase in area school populations due to the enrollment of an additional 80 children in the San Felipe Del Rio CISD. The grade distribution of the

additional students is unknown; however, current capacities at San Felipe Del Rio CISD schools indicate that all schools identified in Section 3.3.12.3 could accommodate an additional 80 children.

Economy. Expenditures incurred during construction, renovation, and demolition would result in a positive short-term impacts to the local economy. Also, the addition of 436 individuals to the local community would result in a positive long-term impact.

4.3.12.2 Alternative 1 – Potential Development Alternative

Population. Impacts for Alternative 1 would be the same as the Proposed Action, except that the population of Val Verde County would be increased by an additional 197 persons.

Housing. Impacts for Alternative 1 would be the same as the Proposed Action, except that under Alternative 1, it is assumed that a portion of the overall installation development would include construction of additional MFH and unaccompanied housing to accommodate additional personnel (See Table 2-4). Therefore, adequate housing would be available for all military personnel and families and there would be no impacts to housing for military personnel and families. If off-base housing were utilized by arriving personnel, there would be a decrease in off-base housing units available to the general public; therefore, there would be a minor long-term impact on housing for the general community. This impact would become short term if the commercial housing market responded with additional construction.

Education. There would be a long-term increase in area school populations due to the enrollment of an additional 69 children in the San Felipe Del Rio CISD. The grade distribution of the additional students is unknown; however, current capacities at San Felipe Del Rio CISD schools indicate that all schools identified in Section 3.3.12.3 could accommodate an additional 69 children.

Economy. Expenditures incurred during construction, renovation, and demolition would result in positive short-term impacts to the local economy. Also, the addition of 633 individuals to the local community would result in a positive long-term impact.

4.3.12.3 No Action Alternative

Population. Under the No Action Alternative, there would be no change in the baseline conditions described in Section 3.3.12.1. Therefore, there would be no impact on population.

Housing. Under the No Action Alternative, there would be no change to baseline conditions described in Section 3.3.12.2. Therefore, there would be no impact on housing.

Education. Under the No Action Alternative, there would be no change to baseline conditions described in Section 3.3.12.3. Therefore, there would be no impact on education.

Economy. Under the No Action Alternative, there would be no change to baseline conditions described in Section 3.3.12.4. Therefore, there would be no impact on education.

4.3.12.4 Mitigative Actions

Impacts to population, off-base housing, and school enrollment resulting from the Proposed Action and Alternative 1 would be minor; and, the local community would be able to accommodate these impacts. Therefore, no mitigative actions would be required.

4.3.13 Environmental Justice and Environmental Health and Safety of Children

As discussed in Section 3.3.13, the Air Force has issued guidance on environmental justice analysis and analysis of the environmental health and safety of children as a part of the Environmental Impact Analysis Process. In order to comply with EO 12898, ethnicity and poverty status in the study area have been examined and compared to state and national statistics to determine if minority or low-income groups could be disproportionately affected by the Proposed Action and alternatives. Additionally, to comply with EO 13045, environmental health and safety risks have been identified to determine if children could be disproportionately affected by the Proposed Action and alternatives.

4.3.13.1 Proposed Action

Construction activities associated with the Proposed Action would cause short-term increases in air and noise emissions for the duration of construction activities. However, emissions would attenuate rapidly with distance from the construction site and would be evenly distributed throughout the project area, thereby not disproportionately affecting a single population, including children. Short-term solid waste impacts would be limited to the construction and established disposal sites. Short-term traffic congestion would increase on the installation and would equally affect all who transit the area. Therefore, no disproportionate impacts to majority-minority or low-income populations from short-term solid waste and transportation impacts would be expected. Expenditures associated with project activities would have a short-term positive impact on the local economy. It is assumed that workers, both skilled and unskilled, would be drawn from the available work force. As such, short-term positive impacts would be evenly distributed within the region, thereby not disproportionately affecting a single population. Disposal of hazardous substances would be managed by the contractor; therefore, children would not be exposed to hazardous materials or wastes generated by the Proposed Action.

4.3.13.2 Alternative 1 – Potential Development Alternative

Impacts for this alternative would be the same as those described for Proposed Action.

4.3.13.3 No Action Alternative

Under the No Action Alternative, there would be no change to the baseline conditions described in Section 3.3.13.

4.3.13.3.1 Mitigative Actions

There would be no disproportionate adverse impacts to children, minority, or low-income populations as a result from the Proposed Action, Alternative 1, or the No Action Alternative; therefore, no mitigative actions would be required.

4.4 CUMULATIVE EFFECTS

Airspace Use and Management

No other actions were identified in the ROI that, when combined with the impacts of the Proposed Action of Alternative 1, would have a cumulative impact to the airspace setting in Del Rio, Laughlin AFB or the MOAs.

Noise

There are no other actions in the ROI that would have a cumulative impact to the aircraft operations noise setting in the vicinity of Laughlin AFB. With respect to noise from construction activities, the proposed sites would be sufficiently dispersed geographically and temporally so that their transitory, localized impacts would not create an adverse cumulative impact.

Land Use

The cumulative effects of the Proposed Action and Alternative 1 along with the other construction projects on Laughlin AFB would be in accordance with the installation General Plan, and therefore, would result in the long-term benefits of implementing the land use recommendations contained in the plan.

Air Quality

The Air Force proposes to conduct twelve other construction and/or demolition projects (see Section 2.6) during the same general time period as the Proposed Action or Alternative 1 at Laughlin AFB. Air emissions from these other construction projects would also primarily be short-term in nature, and associated with construction activities. The cumulative effects from the Proposed Action or Alternative 1, and the other proposed projects would be expected to have little impact when compared to the total emissions for Val Verde County.

Earth Resources

The projects discussed in Section 2.6 are similar in scope and scale to those in the Proposed Action and Alternative 1. The soils in the vicinity of the proposed construction projects at Laughlin AFB have been altered over time and the project area is permanently disturbed with existing facilities and paved roads. Potential cumulative effects would include an increase in soil disturbance associated with construction activities. These impacts would be minimized by the use of BMPs to minimize soil erosion and reduce fugitive dust emissions.

Biological Resources

Implementing all of the proposed projects and developing 40 percent of the open space areas would reduce the wildlife population on the installation. Once these lands are developed, they would no longer support the same type or abundance of wildlife or vegetation communities. Continued development beyond this level would ultimately eliminate wildlife communities within the boundaries of the installation. This would not likely affect the wildlife populations of the area; however, the lack of wildlife on an installation decreases visual aesthetics and personnel morale and welfare.

Cultural Resources

There are no architecturally historic properties at Laughlin AFB, including the larger ROI; therefore, there would be no cumulative impacts resulting from the Proposed Action or Alternative 1. Any potential adverse effects to significant archeological resources under the Proposed Action or Alternative 1 would be mitigated through data recovery; thus, there would be no potential for cumulative impacts.

Water Resources

Surface water management would present the main issue of concern. In the short term, construction and shallow excavation required during the construction activities would primarily require addressing sediment control and runoff. In the long term, additional overall land flow would be possible due to increased impervious surface. It would also be probable, as a result of newer storm water designs and construction techniques, that an improvement in surface water control and long-term reduction in sedimentation would occur. As a result, activities associated with the proposed and alternative actions would not contribute to cumulative effects to water resources.

Hazardous Materials and Wastes

The Proposed Action and alternative action activities would require the management of ACM, LBP, and aircraft associated hazardous materials and waste. Management of these materials and waste streams would occur under the existing Laughlin AFB management programs and would not result in adverse effects. The potential for the presence and management of pesticide-impacted soils beneath existing facilities would also not result in adverse effects. Therefore, the proposed and alternative actions would not contribute to cumulative effects to hazardous materials and wastes in or around Laughlin AFB.

Safety

No cumulative impacts on safety related to the operation of aircraft would be anticipated. Implementation of the Proposed Action and the other construction projects at Laughlin AFB would slightly increase the short-term risk associated with construction contractors performing work at these locations. Contractors would be required to establish and maintain safety programs that would provide protection to their workers and limit the exposure of base personnel to construction hazards.

Utilities and Infrastructure

None of the other projects scheduled to occur during the same time as the Proposed Action or Alternative 1 would contribute to a change in population. Therefore, these concurrent projects would not contribute to the overall increases in potable water consumption, sanitary waste, and electrical and natural gas consumption resulting from the Proposed Action and Alternative 1. They would, however, contribute to an increase in solid waste generation resulting from construction, renovation, and demolition. These concurrent actions would also contribute to the temporary short-term increase in traffic at Laughlin AFB and the surrounding area due to transportation of heavy equipment, materials, and roll-off dumpsters to and from the construction locations. This would increase the deterioration of roadways already projected from the Proposed Action and Alternative 1. Additional impervious cover constructed as a result of the concurrent actions would contribute to an increase in storm water runoff resulting from the Proposed Action and Alternative 1.

Socioeconomic Resources

None of the other projects scheduled to occur during the same time as the Proposed Action or Alternative 1 would contribute to a change in population, housing, or education. Therefore, these concurrent projects would not contribute to the overall increases to population, housing, and education requirements resulting from the Proposed Action and Alternative 1. Projects occurring during the same time period as the Proposed Action and Alternative 1 would contribute additional positive impacts to the economy through expenditures in the local area.

Environmental Justice and Environmental Health and Safety of Children

The impacts associated with the Proposed Action and alternatives are short-term in nature and would not disproportionately affect children, minorities, or low-income populations in the project area or contribute to negative cumulative effects for children or environmental justice populations.

(no document text this page)

Chapter 5

List of Preparers

CHAPTER 5
LIST OF PREPARERS

Name/Organization	Degree	Resource Area	Years of Experience
Carlton Hendrix/WESTON	BS, Environmental Engineering; MS Civil Engineering	Project Manager; Resource Lead, Air Quality, Earth Resources, Safety	8
Paige Rhodes/WESTON	BS, Biology; MS, Environmental Science	Senior Technical Review	14
Kurt M. Hellauer/Geo-Marine, Inc.	BA, Government	Resource Lead, Airspace Use and Management, Noise, Land Use	15
Marsha Prior/Geo-Marine, Inc.	BA, Sociology; MA, Anthropology; PhD, Anthropology	Resource Lead, Cultural Resources	15
Dana Banwart/Geo-Marine, Inc.	BS, Biology	Resource Lead, Biological Resources	8
Jennifer Peters/WESTON	BS, Geography	Resource Lead, Water Resources; Hazardous Materials and Wastes	5
Tamara Carroll/WESTON	BS, Bioenvironmental Science	Resource Lead, Infrastructure and Utilities, Socioeconomics, Environmental Justice and Environmental Health and Safety of Children; Document compilation and formatting	5
Elisa Morales/WESTON	BS, Biology	Resource Specialist, Socioeconomics, Environmental Justice and Environmental Health and Safety of Children	4
Raul Reyes/WESTON	BAAS, Wildlife Biology	Resource Specialist, Earth Resources; Safety; Environmental Justice and Environmental Health and Safety of Children, Safety	8

(no document text this page)

Chapter 6

List of Persons and Agencies Consulted

CHAPTER 6
LIST OF PERSONS AND AGENCIES CONSULTED

Federal Agencies

International Boundary and Water Commission, United States Section
NEPA Coordinator

Laughlin Air Force Base, Texas
Barefoot, Eric (47CES/CEVR)
Barlet, Maj. Gary (47 CS/CC)
Barrios, Celmente (47CES/CECCM)
Caniglio, Msgt. Dora (47ADS/SGGT)
Estrada, Robert (47CES/CECC)
Flores, Ramon (47 CES/CEV)
Gallaher, Danny (47FTW/MX)
Gallegos, Dan (47CES/CEVR)
Hewitt, Mark (47FTW/MX)
House, Duane (47FTW/MXXD)
Morin, David (47 CES/CEV)
Olsen, Nathan (47CES/CECM)
Parks, Stuart (47CES/DJI)
Pence, Maj. Dan (47 FTW/XP)
Reed, Maj. Eric (87 FTS)
Rials, Msgt. Thurman (47 SFS/SFO)
Rutzke, Msgt. Robin (47ADS/SGGT)
Scott, Jeff (47 CS/SCX)
Stone, Lisa (MSG/SV)
Torres, Robert (47 OSS/OSOR)
Woods, Laine (AFOSI)

National Park Service
Harnishfeger, Lauren

Randolph Air Force Base, Texas, Headquarters Air Education and Training Command
Salas, Patricia (HQ AETC/A7CVI)

United States Department of Agriculture, Natural Resource Conservation Service, Del Rio Service Center
Lindley, Clay

United States Environmental Protection Agency, Federal Assistance Section
Jansky, Michael

United States Fish and Wildlife Service, Ecological Services Field Office
Pine, Robert (Field Supervisor)

Schools and School Districts

Del Rio Freshman School
Muraira, Christina (Attendance Secretary)

Del Rio High School
McCutchinson, Ronnie

Del Rio Middle School
Carrasco, Lisa (Attendance Clerk)

Native American Tribes

Kickapoo Traditional Tribe of Texas, Kickapoo Traditional Council
Garza, Juan

Texas State Agencies

Middle Rio Grande Development Council, Committee on the Environment
Gonzalez, Roberto (Chairperson)

Office of the Governor, Texas Review and Comment System
Francis, Denise (State Single Point of Contact)

Texas Commission on Environmental Quality
NEPA Coordinator
Rubinstein, Carlos (Acting Regional Director)

Texas Historical Commission – State Historic Preservation Office
Oaks, Lawrence F. (Executive Director)

Texas Water Development Board
Ward, Kevin (Executive Administrator)

City of Del Rio

City of Del Rio
Rivas, Ray (City Planner)

Del Rio Chamber of Commerce
Henderson, Linda (Executive Director)

Mayor's Office
Valdez, Efrain (Mayor)

Val Verde County

County Courthouse
Fernandez, Manuel (Judge)
Nettleton, Robert (Commissioner)

Edwards County

County Courthouse
Gallegos, Nick (Judge)

(no document text this page)

Chapter 7

References

CHAPTER 7
REFERENCES

ACHP. 1995. Advisory Council on Historic Preservation and GSA Interagency Training Center. Introduction to Federal Projects and Historic Preservation Law: Participant's Course Book. Page II-55.

Campbell, Dharell. 2006. Telephone conversation between Tamara Carroll, Weston Solutions, Inc. and Dharell Campbell, Landfill Coordinator, Del Rio Municipal Landfill. 4 August.

Carrasco. 2007. Telephone conversation between Raul Reyes, Jr., Weston Solutions, and Lisa Carrasco, Del Rio Middle School. 8 January.

Casillas. 2007. Telephone conversation between Tamara Carroll, Weston Solutions, and Abelardo Casillas, Management Information Systems Director, San Felipe Del Rio Consolidated Independent School District. 10 January.

Cranston, Michael Major. 2006. Personal communication between Major Michael Cranston, Chief of Flight Safety, Laughlin AFB and Raul Reyes, Jr., Weston Solutions, providing T-6 and T-38C mishap data. September 21, 2006.

Dering, J. P., ed. 1998. *Archaeological Context and Land Use in the Western Rio Grande Plains: Phase II Evaluations at Eleven sites on the Laughlin Air Force Base, Val Verde County, Texas.* Technical Report No. 1. College Station: Center for Ecological Archaeology, Texas A&M University.

DeVore, S.L. 1993. *Cultural Resource Assessment of Laughlin Air Force Base, Val Verde County, Texas*. Denver: Interagency Archeological Services, National Park Service Center.

DoD. 1977. Department of Defense. Instruction 4165.57 Air Installation Compatible Use Zones. Washington, D.C.

Eaton, Stuart. 2000. Construction Noise. Vancouver: Workers' Compensation Board of British Columbia.

FAA. 2006a. Federal Aviation Administration. FAA National Aeronautical Charting Office (NACO) Digital Aeronautical Information CD—Volume No. 0613 Effective from December 21, 2006 to January 18, 2007.

_____. 2006b. Federal Aviation Administration. *Directive 7400.20F Procedures for Handling Airspace Matters.* 16 February.

_____. 1992. Federal Aviation Administration. Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations. Washington, D.C: United States Department of Transportation.

FEMA. 1987. Federal Emergency Management Agency. Federal Insurance Rate Map for Val Verde County, Texas. June 1, 1987.

FICUN. 1980. Federal Interagency Committee on Urban Noise. *Guidelines for Considering Noise in Land Use Planning and Control.* June.

GMI. 2006. GeoMarine, Inc. 2006 Aircraft Operations Data for Laughlin AFB. Data collected and processed by Geo-Marine, Inc. at Laughlin AFB, Texas. June.

Graf. 2006. E-mail correspondence between Carlton Hendrix, Weston Solutions, and Ben Graf, 47 CES/CEV. 25 August.

Greene, J.A. 1996. *Laughlin Air Force Base, Del Rio, Texas, Historic Building Inventory.* Denver: National Park Service.

Johnston, Marshall Ph.D. 2006. Edwards Plateau, CPD Site NA32. The University of Texas, Botany Department, Austin, Texas. http://www.nmnh.si.edu/botany/projects/cpd/na/na32.htm. Accessed August 1, 2006.

Limones. 2006. Telephone conversation between Tamara Carroll, Weston Solutions, and Manuel Limones, Pupil Services Coordinator. 14 August.

McCuthinson. 2007. Telephone conversation between Raul Reyes, Jr., Weston Solutions, and Ronnie McCutchinson, Del Rio High School. 8 January.

Muraira. 2007. Telephone conversation between Raul Reyes, Jr., Weston Solutions, and Christina Muriara, Del Rio Freshman School. 8 January.

NPS. 1997. National Park Service. *How to Apply the National Register Criteria for Evaluation.* National Register Bulletin 15. Washington, D.C.: US Department of the Interior, National Park Service, Interagency Resources Division.

Reagan, Jerry A. and Charles. A. Grant. 1977. Special Report: Highway Construction Noise: Measurement, Prediction, and Mitigation. Federal Highway Administration Bulletin: May 2.

Salo, E., et al. 2002. *Laughlin Air Force Base: Cold War Buildings and Structures Inventory and Assessment.* United States Air Force Air Education and Training Command Cold War Context Series Reports of Investigations Number 4. Plano: Geo-Marine, Inc.

Schomer, Paul. 2001. A White Paper: Assessment of Noise Annoyance. Champaign, Illinois: Schomer and Associates, Inc.

Spude, R.L. 1996. Historical Structures Evaluation. National Park Service, Denver Service Center.

Suter, Alice H. 2002. Construction Noise: Exposure, Effects, and the Potential for Remediation; A Review and Analysis. AIHA Journal 63:768-789.

TCEQ. 2006a. Texas Commission on Environmental Quality. Multi-Sector General Permit No. TXR05M844. August.

_____. 2006b. Texas Commission on Environmental Quality. Central Registry Query – Regulated Entity Information. Available at http://www4.tceq.state.tx.us/crpub/index.cfm?fuseaction=regent.showSingleRE&reg_ent_id=577745442002178. Accessed on December 20, 2006.

_____. 2003. Texas Commission on Environmental Quality. General Permit to Discharge Waste, TPDES General Permit No. TXR150000. 5 March.

Tempest, William, ed. 1985. The Noise Handbook. New York: Academic Press.

Tennis, C., et al., eds. 1996. *Archaeological Survey of Laughlin Air Base, Val Verde, Texas.* Archaeological Survey Report No. 239. San Antonio: Center for Archaeological Research, The University of Texas at San Antonio.

TPWD. 2005. Texas Parks and Wildlife. Hill Country Wildlife District, Val Verde County Homepage. http://www.tpwd.state.tx.us/landwater/land/habitats/hillcountry/counties/valverde/. Accessed August 1, 2006.

TPWD. 1995. Texas Parks and Wildlife. Biological Survey of Laughlin Air Force Base. Prepared by Texas Natural Heritage Program Division Texas Parks and Wildlife. April 1995.

TWDB. 2006. Texas Water Development Board. *Major Aquifers for Texas*. December.

USAF. 2006a. United States Air Force. *Environmental Assessment for Multiple Projects - Laughlin AFB*, prepared by SAIC for Laughlin AFB, May.

_____. 2006b. United States Air Force. *General Plan – Laughlin AFB*, prepared by URS Corporation for Laughlin AFB, May.

_____. 2006c. United States Air Force. *Air Operations Summary for Laughlin AFB (Draft).*

_____. 2006d. United States Air Force. *Solid Waste Diversion FY06 Metrics – Laughlin AFB,* US Air Force Air Education and Training Command, Laughlin AFB.

_____. 2006e. United States Air Force. *Hazardous Waste Management Plan – Laughlin AFB*, US Air Force Air Education and Training Command, Laughlin AFB.

_____. 2006f. United States Air Force. *BASH Plan 706, Laughlin AFB, Texas,* for 47TH Flying Training Wing, Laughlin AFB, Texas. April 2006.

_____. 2006e. United States Air Force. *Laughlin Air Force Base Solid Waste Plan*.

_____. 2005a. United States Air Force. Laughlin Air Force Base 47th Flying Training Wing Economic Impact for Fiscal Year 2005.

_____. 2005b. United States Air Force. *Application of the Resource Capability to Air Education and Training Command, Laughlin AFB- Draft Report.* Prepared by Weston Solutions, Inc. December.

_____. 2005c. United States Air Force. Laughlin Air Force Base. *Integrated Natural Resource Management Plan*. Laughlin Air Force Base, Texas. March.

_____. 2005d. *Environmental Baseline Survey for Military Family Housing – Laughlin AFB*, prepared by URS Corporation for Laughlin AFB, August.

_____. 2005e. *Management Action Plan – Laughlin AFB*, US Air Force Air Education and Training Command, Laughlin AFB.

_____. 2005f. United States Air Force. *January to December 2005 Waste Water Report*.

_____. 2005g. United States Air Force. *Electric, Natural Gas, and Water Consumption for CY05, Laughlin Air Force Base, Texas*.

_____. 2005h. United States Air Force. Air Conformity Applicability Model, Version 4.3. Air Force Center for Environmental Excellence, Brooks City-Base, TX. December.

_____. 2004a. United States Air Force. *2004 Air Emissions Inventory for Laughlin AFB, Texas*.

_____. 2004b. United States Air Force. *Integrated Cultural Resources Management Plan*. Volume 1. Laughlin AFB, TX: HQ AETC/CEV. October.

_____. 2003a. United States Air Force. *Storm Water Pollution Prevention Plan,* US Air Force Air Education and Training Command, Laughlin AFB.

_____. 2003b. United States Air Force. *Asbestos Management Plan – Laughlin AFB,* US Air Force Air Education and Training Command, Laughlin AFB.

_____. 2003c. United States Air Force. Housing Requirements and Market Analysis: 2002-2007, Laughlin Air Force Base, Texas. December.

_____. 2002a. United States Air Force. *Gate Security, Safety, and Capacity Traffic Engineering Guidance, Laughlin Air Force Base, Texas*. March.

_____. 2002b. United States Air Force. *2002 Traffic Study at Laughlin Air Force Base*.

_____. 2000a. United States Air Force. Realistic Bombing Training Range Environmental Impact Statement (EIS).

_____. 2000b. United States Air Force. Air Installation Compatible Use Zone (AICUZ) Study for Laughlin Air Force Base, Texas.

_____. 1999. United States Air Force. Air Force Handbook 32-7084 AICUZ Program Manager's Guide. Washington, D.C.: United States Air Force.

_____. 1998. United States Air Force. Air Force Instruction 32-7063 Air Installation Compatible Use Zone Program. Washington, D.C.: United States Air Force.

_____. 1978. United States Air Force. Departments of the Air Force, the Army, and the Navy, AFM 19-10, TM 5-803-2, NAVFAC P-970, Environmental Protection, Planning in the Noise Environment. Washington, D.C.: United States Air Force.

USCB. 2006a. United States Census Bureau. *Census 2000 Population Estimate for Val Verde County*. Available at: http://factfinder.census.gov/servlet/SAFFPopulation?_event=Search&geo_id=01000US&_geoContext=01000US&_street=&_county=Val+Verde+County&_cityTown=Val+Verde+County&_state=04000US48&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=010&_submenuId=population_0&ds_name=null&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry=. Accessed 15 August 2006.

_____. 2006b. United States Census Bureau. *Census 2000 Demographic Profile Highlights for Del Rio City, Texas*. Available at: http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&geo_id=05000US48465&_geoContext=01000US%7C04000US48%7C05000US48465&_street=&_county=Del+Rio&_cityTown=Del+Rio&_state=04000US48&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=050&_submenuId=factsheet_1&ds_name=DEC_2000_SAFF&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry=. Accessed 15 August 2006.

_____. 2006c. United States Census Bureau. *Census 2000 QuickFacts for Del Rio City, Texas*. Available at: http://quickfacts.census.gov/qfd/states/48/4819792.html. Accessed 15 August 2006.

_____. 2006d. United States Census Bureau. *Census 2000 QuickFacts for Texas*. Available at: http://quickfacts.census.gov/qfd/states/48000.html. Accessed 15 August 2006.

_____. 2006e. United States Census Bureau. *Census 2000 QuickFacts for the United States*. Available at: http://quickfacts.census.gov/qfd/states/00000.html. Accessed 15 August 2006.

_____. 2006f. United States Census Bureau. Census 2000 Del Rio City, Texas, Fact Sheet. Available at: http://factfinder.census.gov/servlet/SAFFFacts?_event=&geo_id=16000US4819792&_geoContext=01000US%7C04000US48%7C16000US4819792&_street=&_county=Del+Rio&_cityTown=Del+Rio&_state=04000US48&_zip=&_lang=en&_sse=on&ActiveGeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_1&ds_name=null&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry=. Accessed 19 December 2006.

_____. 2006g. United States Census Bureau. *Profile of Selected Economic Characteristics: 2000 – Texas.* Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=04000US48&-qr_name=DEC_2000_SF4_U_DP3&-ds_name=D&-_lang=en&-redoLog=false. Accessed 19 December 2006.

_____. 2006h. United States Census Bureau. *Profile of Selected Economic Characteristics: 2000 – United States*. Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-qr_name=DEC_2000_SF4_U_DP3&-geo_id=01000US&-ds_name=D&-_lang=en&-redoLog=false. Accessed 19 December 2006.

_____. 2006i. United States Census Bureau. *Profile of Selected Economic Characteristics: 2000 – Del Rio.* Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-qr_name=DEC_2000_SF3_U_DP3&-geo_id=16000US4819792&-ds_name=DEC_2000_SF3_U&-_lang=en&-redoLog=false&-_sse=on. Accessed 19 December 2006.

_____. 2006j. United States Census Bureau. Population and Race Information for Del Rio, Texas. Available at: http://factfinder.census.gov/servlet/DTTable?_bm=y&-context=dt&-ds_name=DEC_2000_SF1_U&-mt_name=DEC_2000_SF1_U_P001&-mt_name=DEC_2000_SF1_U_P003&-mt_name=DEC_2000_SF1_U_P011&-CONTEXT=dt&-tree_id=4001&-all_geo_types=N&-geo_id=16000US4819792&-search_results=16000US4819792&-format=&-_lang=en. Accessed 20 December 2006.

_____. 2006k. United States Census Bureau. Population and Race Information for Val Verde County, Texas. Available at: http://factfinder.census.gov/servlet/DTTable?_bm=y&-context=dt&-ds_name=DEC_2000_SF1_U&-CONTEXT=dt&-mt_name=DEC_2000_SF1_U_P001&-mt_name=DEC_2000_SF1_U_P003&-mt_name=DEC_2000_SF1_U_P011&-tree_id=4001&-redoLog=true&-all_geo_types=N&-_caller=geoselect&-geo_id=05000US48465&-search_results=01000US&-format=&-_lang=en. Accessed 20 December 2006.

_____. 2006l. United States Census Bureau. Poverty Status of Individuals for Del Rio, Texas. Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-context=qt&-qr_name=DEC_2000_SF3_U_QTP34&-ds_name=DEC_2000_SF3_U&-CONTEXT=qt&-tree_id=403&-redoLog=false&-all_geo_types=N&-geo_id=16000US4819792&-search_results=16000US4819792&-format=&-_lang=en. Accessed 20 December 2006.

_____. 2006m. United States Census Bureau. Poverty Status of Individuals for Val Verde County, Texas. Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-context=qt&-qr_name=DEC_2000_SF3_U_QTP34&-ds_name=DEC_2000_SF3_U&-CONTEXT=qt&-tree_id=403&-redoLog=true&-all_geo_types=N&-_caller=geoselect&-geo_id=05000US48465&-geo_id=NBSP&-search_results=01000US&-format=&-_lang=en. Accessed 20 December 2006.

_____. 2006n. United States Census Bureau. Poverty Status of Individuals for the United States. Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-context=qt&-qr_name=DEC_2000_SF3_U_QTP34&-ds_name=DEC_2000_SF3_U&-CONTEXT=qt&-

tree_id=403&-redoLog=true&-all_geo_types=N&-_caller=geoselect&-geo_id=01000US&-search_results=01000US&-format=&-_lang=en. Accessed 20 December 2006.

_____. 2006o. United States Census Bureau. Population and Race Information for the United States. Available at: http://factfinder.census.gov/servlet/DTTable?_bm=y&-geo_id=01000US&-ds_name=DEC_2000_SF1_U&-_lang=en&-mt_name=DEC_2000_SF1_U_P001&-mt_name=DEC_2000_SF1_U_P003&-mt_name=DEC_2000_SF1_U_P011&-format=&-CONTEXT=dt. Accessed 20 December 2006.

_____. 2006p. United States Census Bureau. Population and Race information for Texas. Available at: http://factfinder.census.gov/servlet/DTTable?_bm=y&-context=dt&-ds_name=DEC_2000_SF1_U&-CONTEXT=dt&-mt_name=DEC_2000_SF1_U_P001&-mt_name=DEC_2000_SF1_U_P003&-mt_name=DEC_2000_SF1_U_P011&-tree_id=4001&-redoLog=true&-all_geo_types=N&-_caller=geoselect&-geo_id=04000US48&-search_results=01000US&-format=&-_lang=en. Accessed 20 December 2006.

_____. 2006q. United States Census Bureau. Poverty Status of Individuals for Texas. Available at: http://factfinder.census.gov/servlet/QTTable?_bm=y&-context=qt&-qr_name=DEC_2000_SF3_U_QTP34&-ds_name=DEC_2000_SF3_U&-CONTEXT=qt&-tree_id=403&-redoLog=true&-all_geo_types=N&-_caller=geoselect&-geo_id=04000US48&-search_results=01000US&-format=&-_lang=en. Accessed 20 December 2006.

USDA. 1982. United States Department of Agriculture, Soil Conservation Service. *Soil Survey: Val Verde County Texas*. Issued January 1982. < *http://soildatamart.nrcs.usda.gov/Manuscripts/TX465/0/Val%20Verde.pdf*>. Accessed December 21, 2006.

USEPA. 2003a. United States Environmental Protection Agency. *Determining Conformity of General Federal Actions to State or Federal Implementation Plans." Code of Federal Regulations, 40(93, Subpart B: 93.150-93.160)*. US Government Printing Office, Washington DC.

_____. 2003b. United States Environmental Protection Agency. "Determining Conformity of General Federal Actions to State or Federal Implementation Plans." Code of Federal Regulations, 40(51, Subpart W: 51.850-51.860). US Government Printing Office, Washington DC.

_____. 1998. United States Environmental Protection Agency. *Characterization of Building-Related Construction and Demolition Debris in the United States*, prepared by Franklin Associates for the US Environmental Protection Agency Municipal and Industrial Solid Waste Division Office of Solid Waste. June.

_____. 1985. United States Environmental Protection Agency. *Compilation of AirPollutant Emission Factors, Volume 2: Mobile Sources (AP-42),* 4th Edition, Ann Arbor, September 1985.

_____. 1974. United States Environmental Protection Agency. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, Report EPA550/9-74-004. Washington, D.C.: US Environmental Protection Agency, Office of Noise Abatement and Control.

USFWS. 2006. United States Fish and Wildlife Service. Endangered Species List, Val Verde County, Texas. http://www.fws.gov/ifw2es/endangeredspecies/lists/ListSpecies.cfm. Accessed August 1, 2006.

_____. 1999. United States Fish and Wildlife Service. *Endangered and Threatened Wildlifeand Plants; Final Rule To List the Devils River Minnow as Threatened.* Federal Register Volume 64, Number 202.

USGS. 1995. Untied States Geological Survey. Ground Water Atlas of the United States – Oklahoma and Texas, prepared by the United States Geological Survey.

_____. 1985. Untied States Geological Survey *7.5 Quadrangle, Laughlin AFB, Texas*, prepared by USGS, July.

Vernon, Monique. 2006. Telephone conversation between Tamara Carroll, WESTON Solutions, Inc., and Monique Vernon, Economic Development Specialist for the City of Del Rio. 14 August.

Appendix A

Interagency/Intergovernmental Coordination and Public Participation

Scoping Letter Example

DEPARTMENT OF THE AIR FORCE
47TH FLYING TRAINING WING (AETC)

Colonel Dan Laro Clark
Vice Commander, 47th Flying Training Wing
561 Liberty Dr, Suite 1
Laughlin AFB TX 78843-5230

Kevin Ward, Executive Administrator
Texas Water Development Board
1700 North Congress Avenue
P.O. Box 13231
Austin, TX 78711-3231

Dear Mr. Ward

The 47th Flying Training Wing at Laughlin Air Force Base (AFB), Texas, is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). We propose actions to accommodate mission gains in accordance with the 2005 Defense Base Realignment and Closure (BRAC) Commission and development of the installation based upon the Capital Improvements Program (CIP) in our installation General Plan. The BRAC recommendations included relocation of Introduction to Fighter Fundamentals (IFF) for Pilots and Weapons System Officers and a portion of the primary phase of Student Undergraduate Pilot Training (SUPT) from Moody AFB, Georgia to Laughlin AFB, Texas. The General Plan and BRAC requirements define potential facilities and associated site improvements in support of the existing and new missions.

Three alternatives will be considered including the Proposed Action, the Potential Development Alternative, and the alternative to take no action. The Proposed Action includes:

- An addition of 14 T-6 aircraft, 15 T-38C aircraft, and an increase in average daily student load of 30 students.
- An addition of 178 permanent party personnel.
- Facility and infrastructure improvements including 11 facilities planned for construction, 14 facilities planned for expansion or modification, and 12 facilities planned for demolition.

The Potential Development Alternative is development of the installation to its full potential based on vacant parcels of land on the installation.

We solicit comments and concerns regarding the proposal so that we might address them in our analysis. When completed, the Draft EA will be forwarded for your review. A list of agencies contacted is attached. Please let us know if you feel additional agencies should review the proposal. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects. Any questions regarding

this proposal should be directed to our consultant, Weston Solutions, Inc (WESTON). The point of contact at WESTON is Mr. Carlton Hendrix. He can be reached at (210) 308-4308. Please forward your written comments by 8 September 2006 to Mr. Ramon Flores at the following address:

47 CES/CEV
251 Fourth Street
Laughlin AFB, Texas 78843

Sincerely

Laro Clark

DAN LARO CLARK, Colonel, USAF

Attachment:
List of Agencies Contacted

(no document text this page)

Enclosure for Scoping Letter

Interagency and Intergovernmental Coordination for Environmental Planning
Mailing List
Laughlin AFB, Texas

Agency	Department	Address	Address 2	City	State	Zip
Texas Water Development Board		1700 North Congress Avenue	P.O. Box 13231	Austin	TX	78711-3231
International Bounday and Water Commission	United States Section	4171 North Mesa	Suite C-100	El Paso	TX	79902-1441
US Fish and Wildlife Service	Ecological Services Field Office	10711 Burnet Road	Suite 200	Austin	TX	78758-4460
USEPA Region 6	Federal Assistance Section (6E-FF)	1445 Ross Avenue	Suite 1200	Dallas	TX	75202-2733
Texas Commission on Environmental Quality	Region 16	707 E Calton Rd	Suite 304	Laredo	TX	78041-3638
Texas Commission on Environmental Quality		P.O. Box 13087		Austin	TX	78711-3087
Mayor of Del Rio		109 W. Broadway		Del Rio	TX	78840
Del Rio Chamber of Commerce		1915 Veterans Blvd.		Del Rio	TX	78840
City of Del Rio		114 W. Martin		Del Rio	TX	78840
Val Verde County Judge	County Courthouse	P.O. Box 4250		Del Rio	TX	78841
Val Verde County Commissioner	County Courthouse	P.O. Box 4250		Del Rio	TX	78841
The Middle Rio Grande Development Council	Committee on the Environment	307 West Nopal		Carrizo Springs	TX	78834
Kickapoo Traditional Tribe of Texas	Kickapoo Traditional Council	P.O. Box 972		Eagle Pass	TX	78853
National Park Service		1849 C Street, NW		Washington	DC	20240
Office of the Governor	Texas Review and Comment System	P.O. Box 12428		Austin	TX	78711-2428
USDA-NRCS	Del Rio Service Center	302 E 17th Street		Del Rio	TX	78840-3305
Edwards County Judge	County Courthouse	P.O. Box 348		Rocksprings	TX	78880

Scoping Responses

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

AUG 1 6 2006

Mr. Ramon Flores
47 CES/CEV
251 Fourth Street
Laughlin AFB TX 78843

Subject: Scoping for draft environmental assessment on Laughlin Air Force Base developments

Dear Mr. Flores:

The United States Section, International Boundary and Water Commission (USIBWC) would like to thank you for the opportunity to comment during this scoping process for a draft environmental assessment (EA) on accommodating mission gains at Laughlin Air Force Base, Texas, according to the 2005 Defense Base Realignment and Closure Commission. The USIBWC does not own or manage any properties that would be affected in the area of the proposed action. We would like to receive a copy of the draft EA for review once it is developed.

Please provide any future correspondence to my attention. Additionally, correspondence regarding Amistad Reservoir should be sent to: Kenneth Breiten, Project Manager, HCR #3, Box 37, Highway 90 West, Del Rio, TX 78840. Should you have questions regarding the comments made in this letter or on any matter, please contact me at (915) 832-4702.

Sincerely,

Gilbert G. Anaya
Supervisory Environmental Protection Specialist
Environmental Management Division

The Commons, Building C, Suite 100 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

AUG 2 2 2006

Mr. Ramon Flores
47 CES/CEV
251 Fourth Street
Laughlin AFB, Texas 78843

Consultation Number 21450-2006-TA-0214

Dear Mr. Flores:

This responds to your letter received in our office on August 9, 2006, requesting comments on the proposed "BRAC" activities at Laughlin Air Force Base (AFB), Val Verde County, Texas. Below are the U.S. Fish and Wildlife Service (Service) recommendations regarding threatened and endangered species that may be impacted by these activities.

Attached is a list of species to consider when evaluating activities at Laughlin AFB. Beside the potential direct effects to listed species, the Service has concerns regarding potential indirect effects to the threatened Devils River minnow (*Dionda diaboli*) from increased use of Devils River water. Please consider these potential impacts in your analysis. We are providing this information to assist you in assessing and avoiding impacts to federally listed threatened and endangered species, their habitat, and designated wetlands.

Federally listed species

The proposed project site is not located within designated critical habitat of any federally listed threatened or endangered species. You may access a list of federally listed or proposed species by county of occurrence in Texas at http://www.fws.gov/ifw2es/EndangeredSpecies/lists/. A searchable database with information related to the life history and ecology of each of these species can be found at http://endangered.fws.gov/.

Generally, the Service believes that the first step in determining impacts to endangered species is presence/absence surveys conducted within the project area by persons with appropriate biological expertise. Often, absence of endangered species is determined and the project can then proceed without additional responsibilities under the Endangered Species Act of 1973, as amended (Act). If assessments indicate that suitable habitat is likely to be affected either directly or indirectly, we recommend that you consult with us further. If any endangered species or their habitats are present, the project can often be modified to avoid all impacts. Please send any completed surveys or habitat assessments to our office for assistance in evaluating potential effects.

If impacts cannot be avoided, we recommend that U.S. Air Force pursue formal consultation through section 7 of the Act. Section 7 requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy critical habitat of such species. It is the primary responsibility of the U.S. Air Force, as the Federal action agency, to determine whether any action it authorizes, funds, or carries out may affect a federally listed or proposed species.

Candidate Species

We also recommend that you review the potential for your project to affect candidates. Candidate species are those that are being considered for possible addition to the threatened and endangered species list. There is sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but higher priority listings currently preclude issuance of a proposed rule for those species. Candidate species currently have no legal protection. If you find your project may potentially impact these species, the Service would like to provide technical assistance to help avoid or minimize adverse effects. Addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.

State-listed species

The State of Texas also protects certain species of plants and animals. Contact the Texas Parks and Wildlife Department (Endangered Resources Branch), Fountain Park Plaza Building, Suite 100, 3000 South IH-35, Austin, Texas 78704 (512-912-7011) for information concerning fish, wildlife, and plants of State concern.

Wetlands and Native Habitats

If your project will involve filling, dredging, or trenching of a wetland or riparian area it may require a Section 404 permit from the U.S. Army Corps of Engineers. For permitting requirements under Section 404 of the Clean Water Act, please contact the Fort Worth District, Permits Section, CESWF-EV-0, P.O. Box 17300, Fort Worth, Texas, 76102-0300, 817-978-2681.

Wetlands and riparian zones provide valuable fish and wildlife habitat as well as contribute to flood control, water quality enhancement, and groundwater recharge. Wetland and riparian vegetation provides food and cover for wildlife, stabilizes banks, and decreases soil erosion. These areas are inherently dynamic and very sensitive to changes caused by such activities as overgrazing, logging, major construction, or earth disturbance. Construction activities near such areas should be carefully designed to minimize impacts. If vegetation clearing is needed in riparian areas, these areas should be revegetated with native wetland and riparian vegetation to prevent erosion or loss of habitat. We recommend minimizing the area of soil scarification and initiating incremental reestablishment of herbaceous vegetation at the proposed work sites. Denuded and/or disturbed areas should be revegetated with a mixture of native legumes and grasses. Species commonly used for soil stabilization are listed in the Texas Department of

Agriculture's (TDA) Native Tree and Plant Directory, available from TDA at P.O. Box 12847, Austin, Texas, 78711.

We also urge you to take all precautions to ensure sediment loading does not occur to receiving streams in the project area. To prevent and/or minimize soil erosion and compaction associated with construction activities, avoid any unnecessary clearing of vegetation, and follow established rights-of-way whenever possible. All machinery and petroleum products should be stored outside the floodplain and/or wetland area during construction to prevent possible contamination of water and soils. No permanent structures should be placed in the 100-year floodplain.

We thank you for your concern for endangered and threatened species and other natural resources, and we appreciate the opportunity to comment on the proposed project. Should you have any questions about these comments or require further assistance, please contact William Amy at 512-490-0057, extension 234. Please refer to the Service Consultation number listed above in any future correspondence regarding this project.

Sincerely,

Robert T. Pine
Supervisor

Enclosure

Federally Listed as Threatened and Endangered Species of Val Verde County, Texas

DISCLAIMER

This list is based on information available as of on December 12, 2005. This list is subject to change as new biological information is gathered and should not be used as the sole source for identifying species that may be impacted by a project. A list of federally listed or proposed species by county of occurrence in Texas can be found at http://ifw2es.fws.gov/EndangeredSpecies/lists/.

Migratory Species Common to many or all Counties: Species listed specifically in a county have confirmed sightings. If a species is not listed they may occur as migrants in those counties.

Black-capped vireo	(E)	*Vireo atricapilla*
Brown pelican	(E)	*Pelecanus occidentalis*
Least tern	(E ~)	*Sterna antillarum*
Texas snowbells	(E)	*Styrax texana*
Tobusch fishhook cactus *(=Echinocactus=Mammilliaria) tobuschii*	(E)	*Ancistrocactus*
Devils River minnow	(T)	*Dionda diaboli*
Bald eagle	(T)	*Haliaeetus leucocephalus*
Texas hornshell (clam)	(C)	*Popenaias popei*

INDEX

E	=	Species in danger of extinction throughout all or a significant portion of its range.
T	=	Species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
C	=	Species for which the Service has on file enough substantial information to warrant listing as threatened or endangered. These species currently have no legal protection. However, addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.
CH	=	Critical Habitat (in Texas unless annotated ‡)
P/	=	Proposed ...
P/E	=	Species proposed to be listed as endangered.
P/T	=	Species proposed to be listed as threatened.
TSA	=	Threatened due to similarity of appearance. Protections of the Act, such as consultation requirements for Federal agencies under section 7, and recovery planning provisions under section 4(f), do not apply to species listed under similarity of appearance provisions.
□	=	with special rule
‡	=	CH designated (or proposed) outside Texas
~	=	protection restricted to populations found in the "interior" of the United States. In Texas, the least tern receives full protection, except within 50 miles (80 km) of the Gulf Coast.

Draft EA Letter Example

DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

APR 10 2007

Colonel Dan Laro Clark
Commander, 47th Flying Training Wing
561 Liberty Dr, Suite 1
Laughlin AFB, TX 78843-5230

Mr. Kevin Ward
Texas Water Development Board
1700 North Congress Avenue
P.O. Box 13231 Austin TX 78711-3231

Dear Mr. Ward,

The Draft Environmental Assessment (EA) for the General Plan-based Environmental Impact Analysis Process at Laughlin Air Force Base (AFB), Texas is available for public comment. The Air Force is proposing to relocate the Introduction to Fighter Fundamentals (IFF) and Student Undergraduate Pilot Training (SUPT) missions from Moody AFB, Georgia to Laughlin AFB, as well as implement Laughlin AFB's Capital Improvements Program (CIP). The purpose of the proposed and alternative actions is to relocate the IFF and SUPT missions in accordance with BRAC legislation and construct and/or modify facilities and infrastructure at Laughlin AFB (1) in direct support of BRAC requirements, (2) as a part of the overall CIP, or (3) as needed to support future mission growth and development on the installation. The projects resulting from the CIP and BRAC requirements are needed to improve the effectiveness of training; enhance quality of life; replace or renovate old inadequate facilities; correct current deficiencies; and accommodate new mission activities, personnel, equipment and aircraft.

The Draft EA describes and analyzes alternative plans for installation development, including the No Action Alternative, under which installation development would not occur. Copies of the Draft EA are maintained at the Val Verde Public Library, 300 Spring Street, Del Rio, Texas, 78840 (830-774-7595) and Laughlin AFB Library, building 427, Laughlin AFB, Texas, 78843 (830-298-5757).

We request your participation in the process, and solicit any comments or concerns you may have on the Draft EA. Any questions regarding this Draft EA should be directed to our consultant, Weston Solutions, Inc (WESTON). The point of contact at WESTON is Mr. Carlton Hendrix. He can be reached at (210) 308-4308. Please forward your written comments by 15 May 2007 to Mr. Ramon Flores at the following address:

47 CES/CEV
251 Fourth Street
Laughlin AFB, Texas 78843

Sincerely,

Laro Clark

DAN LARO CLARK, Colonel, USAF
Commander

Attachment
Draft EA

Draft EA Responses

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

RICK PERRY, GOVERNOR
JOHN L. NAU, III, CHAIRMAN
F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

April 24, 2007

Ramon Flores
47 CES/CEV
251 Fourth Street
Laughlin AFB, TX 78843

Re: Draft Environmental Assessment (EA): General Plan-Based Environmental Impact Analysis Process Laughlin Air Force Base, Val Verde County, Texas.

Dear Ramon Flores:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC).

Our staff, led by William McWhorter, has completed a review of the above referenced project. We have noted that, according to this proposed undertaking submitted to the THC for review and comment, your statement on page 4-22, under *4.3.7.1 Historic Resources* that, "The Proposed Action would have no effect on historic properties. The buildings and structures proposed for demolition or alteration are not eligible for listing in the NRHP." Based on the information provided, namely that all 27 buildings to be impacted are either less than 50 years of age, or lack integrity, we concur that *Alternative 1 – Potential Development Alternative* would have no effect on historic properties.

Should this project's area of potential effect change to encompass historic properties or historic properties eligible for inclusion in the NRHP, we look forward to consulting with you further in any eligibility determinations, should they develop.

Thank you for your cooperation in the federal review process, and for your efforts to preserve the irreplaceable heritage of our nation. If you have any questions concerning this review or if we can be of further assistance, please contact William McWhorter at 512/463-5833

Sincerely,

for: F. Lawerence Oaks
State Historic Preservation Officer

Final Public Notice

PUBLIC NOTICE

NOTICE OF AVAILABITY
DRAFT ENVIRONMENTAL ASSESSMENT AND
PROPOSED FINDING OF NO SIGNIFICANT IMPACT
FOR GENERAL PLAN-BASED ENVIRONMENTAL IMPACT ANALYSIS PROCESS
AT LAUGHLIN AIR FORCE BASE, TEXAS

An Environmental Assessment (EA) has been prepared to analyze the proposed relocation of the Introduction to Fighter Fundamentals and Student Undergraduate Pilot Training missions to Laughlin Air Force Base (AFB), Texas, and implement Laughlin AFB's Capital Improvements Program (CIP). The EA, prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations, and Air Force instructions implementing NEPA, evaluates potential impacts of the proposed and alternative actions, including the No Action Alternative, on the environment. Based on the EA, the Air Force has prepared a proposed Finding of No Significant Impact (FONSI).

Copies of the EA and proposed FONSI are available at the Val Verde Public Library, 300 Spring Street, Del Rio, Texas, 78840 (830-774-7595) and Laughlin AFB Library, Building 427, Laughlin AFB, Texas, 78843 (830-298-5719).

Comments may be submitted through 15 May 2007 and be provided to Ramon Flores, 47 CES/CEV, 251 Fourth Street, Laughlin AFB, Texas 78843 (830-298-5694).

PRIVACY ADVISORY NOTICE

Public comments on this Draft EA are requested pursuant to NEPA, 42 United States Code 4321, et seq. All written comments received during the comment period will be made available to the public and considered during the Final EA preparation. Providing private address information with your comment is voluntary and such personal information will be kept confidential unless release is required by law. However, address information will be used to compile the project mailing list and failure to provide it will result in your name not being included on the mailing list.

Appendix B

Air Pollutant Emissions Calculations

CONSTRUCTION EMISSIONS FACTORS

Average Construction Equipment Usage Rates (hours)							Equipment Emission Factors (from AP-42, Volume 2 - Mobile Sources)				
	New Construction	Modify Existing Facilities	Demolition	Paving Operations							
Construction Equipment	Multi-Story (per 1,000 ft^2)	Multi-Story (per 1,000 ft^2)	Demolition (per 1,000 ft^2)	Asphalt (per 1,000 yd^3)	Gravel/Dirt (per 1,000 yd^3)	Concrete (per 1,000 yd^3)	CO (lb/hr)	VOC (lb/hr)	NO_X (lb/hr)	SO_X (lb/hr)	PM_{10} (lb/hr)
Backhoe	2.194	0.225	-	-		-	1.794	0.304	1.260	0.137	0.112
Blower	-	-	-	16.000		-	12.100	0.410	0.320	0.017	0.021
Bulldozer	1.387	0.106	-	6.154	6.154	16.000	1.257	0.425	3.840	0.463	0.406
Concrete Truck	3.764	0.376	-	-		203.262	1.794	0.304	4.166	0.454	0.256
Crane	15.545	1.040	3.000	-		-	0.675	0.018	1.691	0.143	0.139
Dump Truck	3.401	0.239	7.960	10.954	40.129	40.129	1.794	0.304	4.166	0.454	0.256
Front-end Loader	2.518	0.184	4.000	-	16.000	16.000	0.572	0.291	1.890	0.182	0.172
Paver	-	-	-	8.000		-	0.675	0.183	1.691	0.143	0.139
Roller	-	-	-	23.906	23.906	-	0.304	0.083	0.862	0.067	0.050
Scraper	-	-	-	4.800		-	0.151	0.052	0.713	0.086	0.061
Striper	-	-	-	16.000		-	12.100	0.410	0.320	0.017	0.021
18-Wheel Truck	30.055	2.484	-	-		182.166	1.794	0.304	4.166	0.454	0.256

Construction Equipment Emission Factors						
	New Construction	Modify Existing Facilities	Demolition	Paving Operations		
Pollutant	Multi-Story (lb/1,000 ft^2)	Multi-Story (lb/1,000 ft^2)	Demolition (lb/1,000 ft^2)	Asphalt (lb/1,000 yd^3)	Gravel/Dirt (lb/1,000 yd^3)	Concrete (lb/1,000 yd^3)
CO	84.385	6.907	18.594	427.979	96.146	792.713
VOC	13.588	1.129	3.639	22.763	21.455	140.825
NO_X	194.193	15.714	45.795	117.062	241.654	1,864.549
SO_X	20.522	1.670	4.771	11.515	25.581	203.523
PM_{10}	12.931	1.038	3.143	8.575	16.719	118.190

VOC Emissions from Asphalt Evaporation (AP-42)	
Density of Asphalt	68.56 lb/ft^3
Weight Percent of Asphalt which Evaporates	5 %

PROPOSED ACTION CONSTRUCTION EMISSION CALCULATIONS

							Heavy Equipment Total Emissions (tons)					Fugative Dust [2] (tons)	Total Air Emissions (tons)				
Fiscal Year (FY)	List	Facility/ Infrastructure	Action	Facility Construction Area (SF)	Activity Code [1]	Additional Paved Area Added (SF)	CO	VOC	NOx	SOx	PM_{10}	PM_{10}	CO	VOC	NOx	SOx	PM_{10}
2007	380	Addition to Aerospace Physiology	Add/alter by expanding the existing facility.	1,206	4	7,973	0.03576	0.00236	0.01812	0.00186	0.00126	0.06069	0.03576	0.00236	0.01812	0.00186	0.0619467
2007	476	Child Development Center	Add/alter by expanding the existing facility.	1,206	4	14300	0.06083	0.00369	0.02498	0.00253	0.00176	0.10252	0.06083	0.00369	0.02498	0.00253	0.1042805
2007	H2	Hangar 2	Add/alter by expanding the tool room in the maintenance facility.	750	4	14300	0.05926	0.00344	0.02139	0.00215	0.00152	0.09950	0.05926	0.00344	0.02139	0.00215	0.1010288
2007	N/A	Pave Road to Vortac	Currently the road is a gravel road. This road would be paved with asphalt.	0	3	65,000	0.25758	0.01370	0.07045	0.00693	0.00516	0.42975	0.25758	0.01370	0.07045	0.00693	0.4349128
2007	920	Munitions Cube	Construct an additional munitions cube in the existing ammunition storage area.	120	5	11,250	0.04964	0.00319	0.02385	0.00243	0.00167	0.07517	0.04964	0.00319	0.02385	0.00243	0.0768426
2007	920	Munitions Cube	Add/alter munitions storage to include four additional storage cubes.	480	1	0	0.00166	0.00027	0.00377	0.00040	0.00025	0.00317	0.00166	0.00027	0.00377	0.00040	0.0034227
2008	320	Student Training Complex, Anderson Hall	Add/alter by expanding the existing student complex.	10,473	4	28600	0.14950	0.01194	0.11328	0.01179	0.00771	0.25833	0.14950	0.01194	0.11328	0.01179	0.2660416
2008	52	Non-Destructive Inspection Shop	Add/alter by expanding the existing Non-Destructive Inspectio facility.	3,251	4	28600	0.12456	0.00786	0.05654	0.00576	0.00396	0.21059	0.12456	0.00786	0.05654	0.00576	0.2145436
2008	328	Simulator Facility	Add/alter by expanding the existing simulator facility.	3,218	4	14300	0.06778	0.00483	0.04078	0.00421	0.00281	0.11582	0.06778	0.00483	0.04078	0.00421	0.1186275
2008	53	Fuels System Maintenance Facility	Add/alter by expanding the existing fuel systems maintenance facility.	3,305	4	28600	0.12475	0.00789	0.05697	0.00581	0.00399	0.21094	0.12475	0.00789	0.05697	0.00581	0.2149286
2008	502	Aircraft Weather Shelter	Add/alter Aircraft by expanding the existing Aircraft Weather Shelter.	13,735	1	0	0.04743	0.00775	0.10791	0.01147	0.00713	0.09081	0.04743	0.00775	0.10791	0.01147	0.0979404
2008	201	Egress Shop	Add/alter Egress Shop.	3,660	4	28600	0.12597	0.00809	0.05976	0.00611	0.00417	0.21329	0.12597	0.00809	0.05976	0.00611	0.21746
2008	413	Flight Line Shack	Expand facility.	600	1	0	0.00207	0.00034	0.00471	0.00050	0.00031	0.00397	0.00207	0.00034	0.00471	0.00050	0.0042784
2008	N/A	Unaccompanied Officers Quarters	Construct a 55 person, Unaccompanied Officers Quarters to house new/increased mission personnel.	39,073	5	167400	2.31195	0.30075	3.97529	0.41877	0.26591	1.36511	2.31195	0.30075	3.97529	0.41877	1.6310252
2008	N/A	Aircraft Parking Apron	Add/alter aircraft parking apron by expanding the existing aircraft parking apron and installing new tie downs, striping, ar six Centralized Aircraft Support System pedestals with electrical and air lines.	0	3	144000	0.57064	0.03035	0.15608	0.01535	0.01143	0.95207	0.57064	0.03035	0.15608	0.01535	0.9634991
2009	339	Office of Special Investigation Facility	Build facility to house the Office of Special Investigations currently located in one section of Building 339.	4,500	5	8,486	0.22349	0.03236	0.44613	0.04708	0.02977	0.08586	0.22349	0.03236	0.44613	0.04708	0.115626
2009	351	Base Theater	Demolition	5,000	7	0	0.04648	0.00910	0.11449	0.01193	0.00786	0.03306	0.04648	0.00910	0.11449	0.01193	0.0409149
2009	N/A	Gasmask Confidence Chamber	Construct a Gasmask Confidence Chamber for military personnel to ensure proper fit and wear of the mask in a chemical environment. Facility would allow for the release of tear gas and camphor.	180	2	0	0.00759	0.00122	0.01748	0.00185	0.00116	0.00119	0.00759	0.00122	0.01748	0.00185	0.0023539
2009	N/A	Storm Drain	Enclose the storm drainage channel from Colorado Avenue and Second Street to Indiana Avenue and Second Street. The storm drainage channel would then be covered with a parking lot. Th long-term goal is to remove all Privately Owned Vehicle parking around facilities between First and Second Streets to increase force protection and decrease congestion along the flight line. This goal is currently being accomplished by removing sections of parking as old facilities are demolished and new facilities are constructed.	0	3	234,918	0.93093	0.04951	0.25463	0.02505	0.01865	1.55318	0.93093	0.04951	0.25463	0.02505	1.5718283
2010	461	Temporary Living Facilities	Demolition	2,000	7	0	0.01859	0.00364	0.04580	0.00477	0.00314	0.01322	0.01859	0.00364	0.04580	0.00477	0.016366
2010	462	Temporary Living Facilities	Demolition	3,000	7	0	0.02789	0.00546	0.06869	0.00716	0.00471	0.01983	0.02789	0.00546	0.06869	0.00716	0.0245489
2010	463	Temporary Living Facilities	Demolition	3,000	7	0	0.02789	0.00546	0.06869	0.00716	0.00471	0.01983	0.02789	0.00546	0.06869	0.00716	0.0245489
2010	460	Temporary Living Facilities	Demolition	2,000	7	0	0.01859	0.00364	0.04580	0.00477	0.00314	0.01322	0.01859	0.00364	0.04580	0.00477	0.016366
2010	241	Building 241	Construct an addition for communications.	16,000	5	19,058	0.75060	0.11272	1.57420	0.16620	0.10496	0.23179	0.75060	0.11272	1.57420	0.16620	0.3367484
2010	348	Communications Facility	Demolition	11,000	7	0	0.10226	0.02001	0.25187	0.02624	0.01729	0.07273	0.10226	0.02001	0.25187	0.02624	0.0900127
2011	N/A	Expansion of two existing entry gates	Expand Main Gate and West Gate, and relocate the north part of the Main Gate Air Park to south of the Main Gate.	303,360	5	75,000	13.09671	2.07691	29.53641	3.12071	1.96731	2.50155	13.09671	2.07691	29.53641	3.12071	4.4688606

PROPOSED ACTION CONSTRUCTION EMISSION CALCULATIONS, cont.

							Heavy Equipment Total Emissions (tons)					Fugative Dust [2] (tons)	Total Air Emissions (tons)				
Fiscal Year (FY)	List	Facility/ Infrastructure	Action	Facility Construction Area (SF)	Activity Code [1]	Additional Paved Area Added (SF)	CO	VOC	NOx	SOx	PM_{10}	PM_{10}	CO	VOC	NOx	SOx	PM_{10}
2012	390	Youth Center	Addition to facility to include an enclosed basketball court.	7,280	1	0	0.02514	0.00411	0.05720	0.00608	0.00378	0.04813	0.02514	0.00411	0.05720	0.00608	0.0519116
2012	N/A	Redesign Parking and Construct Pedestrian Walkway	Retain the Central Parking Area and reconfigure to include a landscaped central pedestrian corridor running from the new Wing Headquarters building through Heritage Park into the Control Tower and flightline. This wide pedestrian corridor would be landscaped with trees.	3,300	1	0	0.01140	0.00186	0.02593	0.00276	0.00171	0.02182	0.01140	0.00186	0.02593	0.00276	0.0235314
2012	N/A	Golf Course	Expand the Golf Course. Ample open space is located adjacen to the existing nine-hole course to allow the development of an additional nine-holes. Expansion would be to the west and southwest of the existing golf course.	3,876,840	6	0	0.00223	0.00050	0.00559	0.00059	0.00039	12.81600	0.00223	0.00050	0.00559	0.00059	12.816387
2012	339	Communications Facility	Demolition	6,000	7	0	0.05578	0.01092	0.13739	0.01431	0.00943	0.03967	0.05578	0.01092	0.13739	0.01431	0.0490979
2012	380	Physiological Training	Demolition	9,000	7	0	0.08367	0.01637	0.20608	0.02147	0.01414	0.05950	0.08367	0.01637	0.20608	0.02147	0.0736468
2012	280 and 282	Water Tower	Build a water tower to replace existing two towers. The location of the new tower would be adjacent to the existing towers to ease connection to the existing water distribution system.	4,000	2	0	0.16877	0.02718	0.38839	0.04104	0.02586	0.02645	0.16877	0.02718	0.38839	0.04104	0.052308
2012	380	Construct New Physiological Training Facility	A new facility would be constructed near the Campus Center to be collocated with other training facilities.	10,764	5	25000	0.55323	0.07840	1.07224	0.11311	0.07158	0.23646	0.55323	0.07840	1.07224	0.11311	0.308035
2012	339	Communications Facility	Build a new facility to house telephone switching functions and to replace Building 339. The site would be close to the current facility due to the requirement to attach to the current telephone infrastructure.	5,000	5	50000	0.40910	0.04451	0.53968	0.05664	0.03630	0.36364	0.40910	0.04451	0.53968	0.05664	0.3999333
2013	255 and 256	96-Person Enlisted Dormitory	Construct a new facility to house enlisted personnel supporting the current mission. The current dormitories, Buildings 255 and 256, were constructed in 1983 and 1984 respectively. Due to their age and usage they can no longer be cost effectively renovated to comply with the new dormitory standards. New dormitory would be located in vicinity of the existing enlisted dormitories.	75,347	5	20,000	3.25833	0.51614	7.33759	0.77525	0.48874	0.63039	3.25833	0.51614	7.33759	0.77525	1.1191319
2013	472, 284, and 494	Consolidated Club	Construct a collocated club. The collocated club would replace Buildings 472, 284, and 494. The new club would be constructed adjacent to the golf course for ease of multi-use and significantly improve the quality of life for the base populace.	37,000	5	100000	1.95740	0.27246	3.70095	0.39031	0.24716	0.90579	1.95740	0.27246	3.70095	0.39031	1.1529455
2014	472	Club XL	Demolition	17,000	7	0	0.15805	0.03093	0.38926	0.04055	0.02671	0.11240	0.15805	0.03093	0.38926	0.04055	0.1391106
2014	284	Club Amistad	Demolition	10,000	7	0	0.09297	0.01819	0.22898	0.02385	0.01571	0.06612	0.09297	0.01819	0.22898	0.02385	0.0818298
						TOTALS	**26.016496**	**3.748073**	**51.247333**	**5.4049547**	**3.4232648**	**24.06355702**	**26.016496**	**3.748073**	**51.247333**	**5.4049547**	**27.486822**

[1] Activity Codes
1) Modify existing facility. Assumes multilevel renovation constructio
2) Construct new facility. Assumes multilevel constructio
3) Paving project (Asphalt). Assumes asphalt paving
4) Combination of 1) and 3) above
5) Combination of 2) and 3) above
6) Earthwork for golf course - Assume shallow (0.5 ft) earth paving over 50% of affected area
7) Demolish existing facility

[2] Assumes 19.2 lbs/acre/day with a 30-day average site disturbance

ALTERNATIVE 1 CONSTRUCTION EMISSIONS CALCULATIONS

			Heavy Equipment Total Emissions (tons)					Fugative Dust [2] (tons)
Activity	**Area**	**Activity Code [1]**	**CO**	**VOC**	**NOx**	**SOx**	**PM_{10}**	**PM_{10}**
Facility Construction (SF)	1,003,296.10	1	42.33	6.82	97.42	10.29	6.49	6.63
Impervious Cover (Acres)	131.3	2	22.66	1.21	6.20	0.61	0.45	37.81
		TOTALS	**65.00**	**8.02**	**103.62**	**10.90**	**6.94**	**44.45**

[1] Activity Codes
1) Construct new facility. Assumes multilevel construction
2) Paving project (Asphalt). Assumes asphalt paving

[2] Assumes 19.2 lbs/acre/day with a 30-day average site disturbance

AIRCRAFT OPERATIONS AIR EMISSIONS CALCULATIONS

FY 2006 BASELINE

Aircraft	Engine	Number of Aircraft	Annual Sorties	Annual Closed Patterns (T/G) per Sortie	Annual T/G	Annual Sorties per Aircraft	Annual T/G per Aircraft	EMISSIONS, tons/yr [1]				
								CO	VOC	NOX	SOX	PM10
T-6A Texan II	PT6A-68	65	26,905.50	6.16	165,737.88	413.93	2,549.81	156.63	32.52	51.27	7.48	1.96
T-38C Talon	J85-GE-5H	79	10,787.40	3.35	36,137.79	136.55	457.44	716.57	46.36	39.67	10.58	18.26
T-1A Jayhawk	JT15D-5B	52	12,000.00	0.05	600.00	230.77	11.54	113.69	65.74	31.47	4.14	14.3
							TOTALS	**986.89**	**144.62**	**122.41**	**22.2**	**34.52**

PROPOSED ACTION AND ALTERNATIVE 1

Aircraft	Engine	Number of Aircraft	Annual Sorties	Annual Closed Patterns (T/G)[2] per Sortie	Annual T/G	Annual Sorties per Aircraft	Annual T/G per Aircraft	EMISSIONS, tons/yr [1]				
								CO	VOC	NOX	SOX	PM10
T-6A Texan II	PT6A-68	79	32,903.10	6.16	202,683.10	416.49	2,565.61	191.52	39.77	62.69	9.15	2.39
T-38C Talon	J85-GE-5H	94	13,034.60	3.35	43,665.91	138.67	464.53	865	55.97	47.87	12.77	22.04
T-1A Jayhawk	JT15D-5B	52	12,000.00	0.05	600.00	230.77	11.54	113.69	65.74	31.47	4.14	14.3
							TOTALS	**1170.21**	**161.48**	**142.03**	**26.06**	**38.73**
						INCREASE FROM BASELINE		**183.32**	**16.86**	**19.62**	**3.86**	**4.21**

[1] Source: U.S. Air Force Air Conformity Applicability Model (USAF 2005h)

[2] T/G = touch-and-go, equivalent to number of closed pattern operations modeled for each aircraft sortie

(no document text this page)