

FINAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

UNITED STATES ARMY ELECTRONIC PROVING GROUND AND THE 2-13th AVIATION REGIMENT – TESTING AND USE OF LASERS ON FORT HUACHUCA

Prepared for:



U.S. Army Electronic Proving
Ground
Fort Huachuca, Arizona



2-13th Aviation Regiment
Fort Huachuca, Arizona

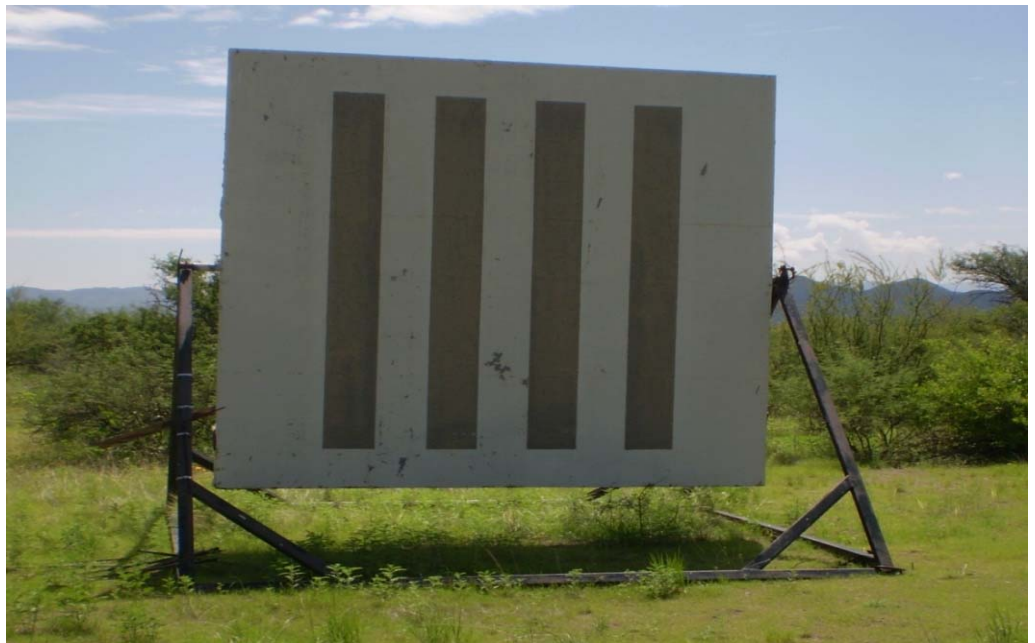
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February 2013



HOW THIS ENVIRONMENTAL ASSESSMENT IS ORGANIZED

The EXECUTIVE SUMMARY briefly describes the Proposed Action and alternatives. Impacts and conclusions are summarized.

ACRONYMS AND ABBREVIATIONS

- SECTION 1 PURPOSE AND NEED discusses the purpose and need for the Proposed Action, the regulatory background surrounding this project, and the scope of this Environmental Assessment.
- SECTION 2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES discusses the Proposed Action and alternatives addressed in this Environmental Assessment.
- SECTION 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES describes the existing environment within the Region of Influence. It also provides a comparison of environmental consequences associated with the alternative. Conservation and mitigation measures are also addressed in this section.
- SECTION 4 FINDINGS AND CONCLUSIONS
- SECTION 5 REFERENCES provides bibliographical information for sources cited in the text of this Environmental Assessment.
- SECTION 6 LIST OF PREPARERS AND CONTRIBUTORS
- SECTION 7 DISTRIBUTION LIST
- SECTION 8 LIST OF INDIVIDUALS AND AGENCIES CONSULTED

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U.S. ARMY ELECTRONIC PROVING GROUND AND 2-13TH AVIATION REGIMENT
TESTING AND USE OF LASERS ON FORT HUACHUCA
FORT HUACHUCA, ARIZONA**

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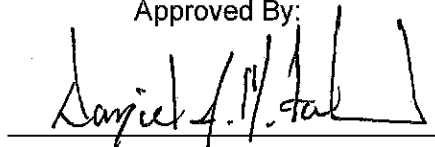
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February 2013

FORMAT PAGE

EXECUTIVE SUMMARY

The Electronic Proving Ground (EPG) is an Army Test Center that falls under the United States (U.S.) Army Test and Evaluation Command (ATEC). The EPG at Fort Huachuca is the primary electronic equipment developmental test center for the ATEC and an historic organization in the electromagnetic (EM) spectrum community. The organization is responsible for the testing and evaluation of a remarkably diverse collection of equipment and systems with test requirements extending anywhere from one-of-a-kind systems to the latest major programs within the Department of Defense (DoD) such as Joint Tactical Radio System (JTRS) and Warfighter Information Network-Tactical (WIN-T). The 2nd Battalion, 13th Aviation Regiment (2-13th) is a U.S. Army unit based at Fort Huachuca whose primary mission is to train soldiers in the operation and maintenance of Unmanned Aircraft Systems (UAS). This battalion operates the largest UAS training center in the world with over 125,000 square feet of training space, four hangars, and three runways.

The EPG and the 2-13th are tenants of Fort Huachuca, a Joint DoD Installation supporting approximately 60 deployable and non-deployable tenant organizations. Fort Huachuca encompasses 73,142 acres located in the City of Sierra Vista, Cochise County, Arizona. The Installation is approximately 75 miles southeast of Tucson and 63 miles northeast of Nogales, Arizona. The southernmost boundary of the Installation is approximately 8 miles from the international border with Mexico. Fort Huachuca is divided into an East Reservation (28,544 acres) and West Reservation (44,598 acres) by State Highway 90. The East Reservation includes the East Range, which consists almost entirely of open/operational areas. The West Reservation includes the West Range, South Range, Cantonment Area, and LAAF.

This Programmatic Environmental Assessment (PEA) was prepared to analyze the potential for significant environmental impacts associated with the use of lasers during testing and training activities at Fort Huachuca, Arizona. The PEA provides a programmatic evaluation of potential impacts that is broad enough in scope to assist in the evaluation of future unknown actions that are comparable to those projects and activities that are currently identified and evaluated herein.

The purpose of the Proposed Action is to allow the EPG and the 2-13th to use lasers on Fort Huachuca and designated off-post sites in support of their testing and training requirements. The activities associated with the Proposed Action are newly acquired mission requirements for the EPG and the 2-13th and include long-term, reoccurring laser testing and training activities.

The use of lasers by these two organizations is necessary to support their military missions and allows the Army to stay technologically competitive in the development and use of lasers within the military community. The EPG would provide the Army with these critical test facilities at Fort Huachuca. Additionally, once laser systems are tested and approved for use by the Army, Soldiers must be properly trained on these lasers for use in theater and during sustainment operations. Fort Huachuca is the Army's premier UAS training facility and is the only location in the continental U.S. where Soldiers receive initial qualifying and training on the Gray Eagle UAS, which is the main laser platform proposed for use at the Fort by the 2-13th.

Alternative One (Proposed Action) includes use of all classes of lasers (Class 1- 4) for testing and training of Soldiers by the EPG and the 2-13th. All lasers proposed for testing and training activities will be solid state lasers.

Laser testing and training would be conducted via ground and air operations within established on-post and off-post sites. These sites include the East Range, South Range, West Range, and Blacktail Test Facility on Fort Huachuca, and leased sites Sunnyside and Willcox Playa. Laser testing and training would include the use of lasers on towers, ground vehicles, Soldier weaponry, other ground-based platforms, aerostats, air vehicles (manned or unmanned), and lighter-than-air vehicles. Class 1 lasers would be used at all sites; Classes 2, 3A, and 3B would be used on the East Range, Blacktail Test Facility, and Willcox Playa. Class 4 lasers would be used on the East Range, Blacktail Test Facility, and Willcox Playa. Additionally, ground-based versions of Classes 2, 3A, and 3B would be permissible at Ranges 6, 8, 9, and 10 located on the South Range; and limited Class 2, 3A, 3B, and 4 aerial to ground lasing may be conducted at Willcox Playa.

Additionally, a new training site will be created by the conversion of part of a dirt taxiway to a paved asphalt runway located adjacent to Hubbard Airstrip on the East Range. The runway would be 5,000-feet (ft) long and 100-ft wide, with 250-ft of overrun at each end of the runway, and an approximately 28,000 square-foot (sf) apron and 7,500-sf taxiway between the apron and runway. The runway would be used by unmanned aerial vehicles (UAVs) only. A 4,000 sf aircraft weather covering would also be constructed along the apron. The aircraft covering would be a metal-sided and roofed structure on a concrete slab. The structure would have a roof-mounted solar panel to provide electricity and a composting toilet, with no need for the installation of new utility lines or extensions from existing utility lines. Security fencing would be constructed around the aircraft covering. The structure would provide temporary cover for aircraft and personnel when on-site maintenance of UAVs was necessary. The structure would not permanently house any UAVs, equipment, tools, or any hazardous materials or waste.

Under Alternative Two, all classes of solid state lasers would be used as described in the Proposed Action, but would be limited to the East Range, South Range, and Blacktail Test Facility. Laser testing and training activities would not be conducted on the West Range, Willcox Playa, and Sunnyside. This Alternative includes the conversion of the taxiway to runway as described in the Proposed Action. This Alternative would allow for necessary testing and training to support the EPG and the 2-13th's military missions; however it significantly decreases the amount of available training and testing areas. Restricting the use of lasers to the East Range, South Range, and Blacktail Test Facility could result in more scheduling conflicts between the new laser training and testing and current testing and training activities that occur on the Fort. These conflicts could impact the EPG or the 2-13th's missions by delaying necessary tests and/or Soldier training.

The No Action Alternative is required under the Council of Environmental Quality regulations implementing the NEPA, and serves as a baseline or benchmark to be used to compare with the Proposed Action and Alternatives. Under the No Action Alternative, current testing and training would continue, with laser use being evaluated on a one-time or limited use basis that

would be covered under RECs as necessary. If limited to the existing level of training and testing, the EPG and 2-13th would not be able to meet their military missions.

A summary of the potential impacts and measures to minimize adverse impacts is provided in Table EX-1. Adverse impacts associated with implementing the Proposed Action at Fort Huachuca, Arizona, would be local in context and of a very temporary nature. Based on the analysis contained herein, this PEA concludes that implementation of Alternative One (Proposed Action), Alternative Two, or the No Action Alternative would not constitute a major federal action with significant impact on human health or the environment. It is recommended that a Finding of No Significant Impact be issued to complete the NEPA documentation process.

Table EX-1. Summary of Potential Impacts and Measures to Minimize Impacts for Alternative One (Proposed Action) and Alternative Two

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
Land Use		X		No significant direct or indirect impacts to Land use are anticipated under Alternatives One or Two. All testing and training events are evaluated and scheduled through appropriate channels prior to the start of training or testing exercise to reduce/eliminate scheduling conflicts. All proposed testing and training would occur on existing training areas and would not alter current land use. The conversion of the taxiway and construction of the aircraft covering structure on the East Range would not result in any significant impacts to land use.
Topography, Geology, and Soils		X		No significant impacts to topography, geology, or soils would result from the implementation of Alternatives One or Two. The Fort actively works to reduce erosion on the Installation and all testing, training, and construction activities associated with the Proposed Action would implement best management practices to reduce any impacts to soils. Minor, short-term impacts to soils would be expected during the conversion of the taxiway and construction of the aircraft covering structure on the East Range.
Hydrology and Water Resources		X		No significant impacts to water resources are anticipated as a result of the implementation of Alternatives One or Two. Activities associated with the Proposed Action would not increase the demand for groundwater and would not directly impact any surface water on- or off-post. Minor, short-term impacts to surface water drainage could occur during the construction of the aircraft covering structure and conversion of the taxiway on the East Range. Additionally, long-term, minor impacts to surface water drainage on that site may result as pervious surfaces are converted to impervious surfaces. Appropriate stormwater management design and implementation on site would minimize these impacts.

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
Biological Resources		X		No significant direct or indirect impacts to biological resources are anticipated. Potential risks to biological resources include wildlife eye and skin damage, and the potential for fires in dry habitat. Compliance with appropriate safety guidelines and regulations, and the Fort's Laser Standard Operating Procedure would minimize these risks. Some short-term minor impacts to biological resources may occur during construction activities on the East Range; however they would be minimal and would only last the duration of the construction.
Cultural Resources			X	No direct or indirect impacts to cultural resources are anticipated as a result of the implementation of Alternatives One or Two. All proposed laser and testing activities would avoid areas with known cultural resources. The construction of the aircraft covering structure and conversion of the taxiway on the East Range would not impact any known cultural resources. In the event that an unknown archaeological resource is discovered during testing, training, or construction activities, all activities would cease and the appropriate Fort personnel would be notified.
Air Quality		X		No significant direct or indirect impacts to air quality are anticipated under Alternative One or Two. No new generators are included in the Proposed Action. Any new generators used to power the lasers will be considered new sources of criteria pollutants and will trigger a permit modification to the air operating permit. Indirect impacts from generators and other diesel-powered vehicles and equipment used as laser platforms during testing activities would not be expected to significantly increase overall air emissions on- or off-post. Construction vehicles and equipment associated with the East Range construction/taxiway conversion would have minor, short-term impacts to overall air emission, primarily from vehicle exhaust and dust generation during construction.
Noise		X		There would be no significant direct or indirect impacts to the noise environment under Alternative One or Two. The lasers proposed for use would not directly produce any significant audible sound. Indirect impacts associated with the platforms the lasers are mounted on, may result during testing and training activities. However, all proposed laser platforms are already in use by the Fort. Noise impacts associated with construction activities on the East range would be minor and short-term.
Visual Resources		X		No significant impacts to visual resources would result from the implementation of Alternative One or Two. All of the laser platforms discussed within this PEA are already in use by the Fort. Incorporation of the lasers onto existing mobile and stationary platforms would not significantly alter the platforms. Testing and training activities using visible laser beams would occur and may be visible on-and off-post. However, given the temporary nature of these activities, no permanent impacts to the overall aesthetics of the area would result. There would be no significant impact resulting from the conversion of the taxiway and construction of the aircraft

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
				covering structure, since this area is in an area not visible from off-post populated areas and is already being used for aircraft activities.
Socioeconomics		X		There would be no significant direct or indirect impacts to local or regional population or economy. Minor short-term beneficial impacts to local sales economy may result during construction-related activities or during testing and training activities. However, none of the activities associated with the Proposed Action would result in an increase in population or result in any adverse impacts to minority or low-income areas.
Transportation and Circulation		X		No significant direct or indirect impacts to transportation or circulation would result from the implementation of Alternative One or Two. Minor, short-term impacts to local roadways on and around the Fort and off-post testing areas may occur during laser testing and training events. However, no significant increases in traffic volume are anticipated. All testing and training activities must be coordinated and scheduled through appropriate channels; therefore no significant impacts to airspace or range access are anticipated. Construction activities on the East Range may increase traffic volumes on the Fort during construction; however these impacts would be less than significant and short-term.
Utilities		X		There would be no significant direct or indirect impacts to utilities. None of the proposed laser testing or training activities would significantly increase demand on any on-post utilities. No off-post utilities are used during testing activities at the off-post leased sites. And, no new utilities are necessary to support new construction on the East Range.
Hazardous and Toxic Substances		X		No significant direct or indirect impacts resulting from the use of hazardous and toxic substances are anticipated. All use, storage, transport, and disposal of hazardous substances and hazardous waste must comply with applicable laws and regulations. Lasers proposed for use at the Fort would contain little to no hazardous substances and would only generate hazardous by-product or waste from exhausted batteries that may be used to power the lasers. Any hazardous waste generated during construction activities at the East Range would be disposed of off-post by the contractor, in compliance with applicable laws and regulations.
Health and Human Safety		X		No significant impacts to health and human safety would result from the implementation of Alternative One or Two. Proper use, storage, and disposal of the lasers, along with the use of appropriate personal protective equipment, and compliance with applicable operating procedures and instructions would greatly reduce the risk of any human health or safety impacts. Impacts associated with construction activities on the East Range would be minor, and temporary in nature.

Level of Anticipated Impact				Summary of Potential Impacts and Measures to Minimize Impacts
Resource Area	Significant	Less than Significant	No Impact	
Electromagnetic Spectrum			X	There would be no impacts to the electromagnetic spectrum under Alternative One or Two. The lasers proposed for use at the Fort would range from infrared to ultraviolet, including visible radiation. These types of radiation are not known to interfere with the other types of radiation used on the Fort, specifically radio and other communications methods.

TABLE OF CONTENTS

1.0	PURPOSE AND NEED	1
1.1	Introduction.....	1
1.2	Purpose and Need for Action	3
1.3	Regulatory Framework	3
1.4	Use of this Programmatic Environmental Assessment	4
1.5	Public Participation Opportunities	5
2.0	DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES.....	7
2.1	Alternative One (Proposed Action).....	7
2.1.1	Laser Technology	7
2.1.2	Laser Technology Regulatory Oversight	9
2.1.3	Locations of Proposed Laser Technology Testing and Training Activity	10
2.1.4	Laser Range Standard Operating Procedures	10
2.1.5	Site-Specific Environmental and Human Health and Safety Review.....	13
2.1.6	Additionally Required Infrastructure	13
2.2	Alternative Two.....	14
2.3	No Action Alternative	14
2.4	Alternatives Considered but Eliminated from Further Analysis	14
3.0	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	17
3.1	Land Use	17
3.1.1	Affected Environment	17
3.1.1.1	On-post	17
3.1.1.2	Off-post	21
3.1.2	Environmental Consequences	22
3.2	Topography, Geology, and Soils	23
3.2.1	Affected Environment	23
3.2.1.1	On-post	23
3.2.1.2	Off-post	26
3.2.2	Environmental Consequences	27
3.3	Hydrology and Water Resources	28

3.3.1	Affected Environment	28
3.3.1.1	On-post	28
3.3.1.2	Off-post	31
3.3.2	Environmental Consequences	31
3.4	Biological Resources	32
3.4.1	Affected Environment	32
3.4.1.1	On-post	32
3.4.1.2	Off-post	40
3.4.2	Environmental Consequences	42
3.6	Cultural Resources	44
3.6.1	Affected Environment	44
3.6.1.1	On-post	44
3.6.1.2	Off-post	45
3.6.2	Environmental Consequences	46
3.7	Air Quality	47
3.7.1	Affected Environment	47
3.7.1.1	On-post	47
3.7.1.2	Off-post	50
3.7.2	Environmental Consequences	50
3.8	Noise	51
3.8.1	Affected Environment	51
3.8.1.1	On-post	51
3.8.1.2	Off-post	53
3.8.2	Environmental Consequences	53
3.9	Visual Resources	54
3.9.1	Affected Environment	54
3.9.1.1	On-post	54
3.9.1.2	Off-post	55
3.9.2	Environmental Consequences	55
3.10	Socioeconomics	57
3.10.1	Affected Environment	57

3.10.1.1	On-post	57
3.10.1.2	Off-post	58
3.10.2	Environmental Consequences	58
3.11	Transportation and Circulation	59
3.11.1	Affected Environment	59
3.11.1.1	On-post	59
3.11.1.2	Off-post	60
3.11.2	Environmental Consequences	61
3.12	Utilities	62
3.12.1	Affected Environment	62
3.12.1.1	On-post	62
3.12.1.2	Off-post	63
3.12.2	Environmental Consequences	64
3.13	Hazardous and Toxic Substances.....	65
3.13.1	Affected Environment	65
3.13.1.1	On-post	65
3.13.1.2	Off-post	68
3.13.2	Environmental Consequences	68
3.14	Human Health and Safety	70
3.14.1	Affected Environment	70
3.14.1.1	On-post	70
3.14.1.2	Off-post	71
3.14.2	Environmental Consequences	72
3.15	Electromagnetic Spectrum	75
3.15.1	Affected Environment	75
3.15.1.1	On-post	75
3.15.1.2	Off-post	77
3.15.2	Environmental Consequences	77
4.0	FINDINGS AND CONCLUSIONS	79
5.0	REFERENCES	83
6.0	PREPARERS AND CONTRIBUTORS.....	93

7.0	DISTRIBUTION LIST	95
8.0	LIST OF INDIVIDUALS AND AGENCIES CONSULTED	97

LIST OF FIGURES

Figure 1-1. Regional Location Map	2
Figure 2-1. Laser Classes Proposed for Use at Designated Testing and Training Areas.....	11
Figure 2-2. Proposed 2-13th Laser Training Flight Path and Target Site.	12
Figure 3-1. Training Areas Map	20
Figure 3-2. Electromagnetic Spectrum	76

LIST OF TABLES

Table 3-1. Special Status Species Within Cochise County.....	35
Table 3-2. Special Status Species With the Potential to Occur within Proposed Action Testing/Training Sites.....	36
Table 3-3. Noise Limits for Noise Zones	52
Table 4-1. Summary of Potential Impacts and Measures to Minimize Impacts for Alternative One (Proposed Action) and Alternative Two.....	79

LIST OF APPENDICES

Appendix A: Fort Huachuca Laser Range SOP.....	A-1
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LIST OF ACRONYMS

µm	Micrometer
2-13 th	2nd Battalion, 13 th Aviation Regiment
AADT	Annual Average Daily Traffic
ADEQ	Arizona Department of Environmental Quality
ADNL	A-Weighted Day Night Level
ADWR	Arizona Department of Water Resources
AEI	Air Emissions Inventory
AEL	Accessible Emission Limit
AF	Acre-Feet
AFA	Acre-Feet Annually
AICUZ	Air Installation Compatible Use Zone
AIRFA	American Indian Religious Freedom Act
AMA	Agave Management Area
AMSL	above mean sea level
ANSI	American National Standards Institute
AR	Army Regulation
ARFF	Airport Rescue Firefighting
ARPA	Archaeological Resources Protection Act
ASMO	Army Spectrum Management Office
ATEC	Army Test and Evaluation Command
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CAA	Clean Air Act
CDNL	C-weighted Day Night Level

CDRH	Center for Devices and Radiological Health
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH ₄	Methane
CLFR	Convoy Live Fire Range
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CWA	Clean Water Act
DA	Department of the Army
dB	Decibel
dBA	A-weighted Decibel
DMM	Discarded Military Munitions
DNL	Day Night Level
DoD	Department of Defense
DPW	Directorate of Public Works
DPTMS	Directorate of Plans, Training, Mobilization, and Security
DRMO	Defense Reutilization and Marketing Office
DZ	Drop Zone
EA	Environmental Assessment
EIS	Environmental Impact Statement
EM	Electromagnetic
ENRD	Environmental and Natural Resources Division
EO	Executive Order

EPA	Environmental Protection Agency
EPG	Electronic Proving Ground
ER/MP	Extended Range/Multi-Purpose
ESA	Endangered Species Act
ET	Evapotranspiration
FAA	Federal Aviation Administration
FD	Fire Department
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FIC	Facility Incident Commander
FLPMA	Federal Land Protection and Management Act
FLPPS	Federal Laser Product Performance Standard
FNSI	Finding of No Significant Impact
ft	feet
FTE	Full-time Equivalent
GHG	Greenhouse Gas
GHz	Gigahertz
GIS	Geographic Information Systems
GPCD	Gallons Per Capita Per Day
HAP	Hazardous Air Pollutant
HAZMAT	Hazardous Material
HMMP	Hazardous Material Management Program
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HWO	Huachuca Water Umbel
IAI	Israel Aerospace Industries

ICRMP	Integrated Cultural Resources Management Plan
IMCOM	Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
IWFMP	Integrated Wildland Fire Management Plan
JLUS	Joint Land Use Study
JTRS	Joint Tactical Radio System
kW	kilowatt
LA	Limiting Aperture
LAAF	Libby Army Airfield
LASER	Light Amplification by Stimulated Emission of Radiation
LLNB	Lesser Long-Nosed Bat
LUPZ	Land Use Planning Zone
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MER	Military Electromagnetic Range
mm	millimeter
MMRP	Military Munitions Response Program
MOSP	Multi-Mission Optronics Stabilized Payload
MOUT	Military Operations on Urban Terrain
MPE	Maximum Permissible Exposure Limit
MRR	Mandatory Reporting Rule
MRS	Munitions Response Sites
MSO	Mexican Spotted Owl

MT	Metric Ton
MW	Megawatt
N ₂ O	Nitrous Oxides
NAGPRA	Native American Graves Protection and Repatriation Act
NAAQS	National Ambient Air Quality Standards
NCCH	Northern Cochise Community Hospital
NEPA	National Environmental Policy Act
NFA	No Further Action
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
nm	nanometer
NOA	Notice of Availability
NOI	Notice of Intent
NOx	Nitrogen Oxides
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NTIA	National Telecommunications and Information Administration
ODS	Ozone Depleting Substance
PAC	Protected Activity Center
Pb	Lead
PEA	Programmatic Environmental Assessment
PHC	Public Health Command
PM	Particulate Matter, fine
POL	Petroleum, Oil and Lubricant
PPE	Personal Protective Equipment

PSD	Prevention of Significant Deterioration
QI	Qualified Individual
REC	Record of Environmental Consideration
RF	Radio Frequency
RFMSS	Range Facility Management Support System
RI	Remedial Investigation
ROI	Region of Influence
RPMP	Real Property Master Plan
sf	square foot
SHPO	State Historic Preservation Office
SI	Site Inspection
SO ₂	Sulfur Dioxide
SOP	Standard Operating Procedure
SPRNCA	San Pedro Riparian National Conservation Area
SVE	Soil Vapor Extraction
SVRHC	Sierra Vista Regional Health Center
SWPPP	Storm Water Pollution Prevention Plan
TPH	Total Petroleum Hydrocarbons
tpy	tons per year
TNC	The Nature Conservancy
U.S.	United States
UAS	Unmanned Aircraft Systems
UASTB	Unmanned Aerial Systems Training Battalion
UAV	Unmanned Aerial Vehicle
USAF	U.S. Air Force

USC	U.S. Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
USPB	Upper San Pedro River Basin
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WIN-T	Warfighter Information Network-Tactical
WWTP	Wastewater Treatment Plant

FORMAT PAGE

1.0 PURPOSE AND NEED

1.1 Introduction

The Electronic Proving Ground (EPG) is an Army Test Center that falls under the United States (U.S.) Army Test and Evaluation Command (ATEC). The EPG at Fort Huachuca is the primary electronic equipment developmental test center for the ATEC and an historic organization in the electromagnetic (EM) spectrum community. The organization is responsible for the testing and evaluation of a remarkably diverse collection of equipment and systems with test requirements extending anywhere from one-of-a-kind systems to the latest major programs within the Department of Defense (DoD) such as Joint Tactical Radio System (JTRS) and Warfighter Information Network-Tactical (WIN-T). Testing requirements extend from Very Low Frequencies to frequencies of more than 400 gigahertz (GHz).

The 2nd Battalion, 13th Aviation Regiment (2-13th) is a U.S. Army unit based at Fort Huachuca whose primary mission is to train soldiers in the operation and maintenance of Unmanned Aircraft Systems (UAS). This battalion operates the largest UAS training center in the world with over 125,000 square feet of training space, four hangars, and three runways. The 2-13th conducts Soldier training for MQ-1C Gray Eagle, MQ-1Warrior-A, MQ-5B Hunter and the RQ-7B Shadow UAS operators and repairers. Flight operations are conducted out of Fort Huachuca's Libby Army Airfield (LAAF) and the Black Tower Complex.

The EPG and the 2-13th are tenants of Fort Huachuca, a Joint DoD Installation supporting approximately 60 deployable and non-deployable tenant organizations. Fort Huachuca encompasses 73,142 acres located in the City of Sierra Vista, Cochise County, Arizona. The Installation is approximately 75 miles southeast of Tucson and 63 miles northeast of Nogales, Arizona. The southernmost boundary of the Installation is approximately 8 miles from the international border with Mexico. Fort Huachuca is divided into an East Reservation (28,544 acres) and West Reservation (44,598 acres) by State Highway 90 (Figure 1-1). The East Reservation includes the East Range, which consists almost entirely of open/operational areas. The West Reservation includes the West Range, South Range, Cantonment Area, and LAAF.

This Programmatic Environmental Assessment (PEA) was prepared to analyze the potential for significant environmental impacts associated with the use of lasers during testing and training activities at Fort Huachuca, Arizona. The PEA provides a programmatic evaluation of potential impacts that is broad enough in scope to assist in the evaluation of future unknown actions that are comparable to those projects and activities that are currently identified and evaluated herein.

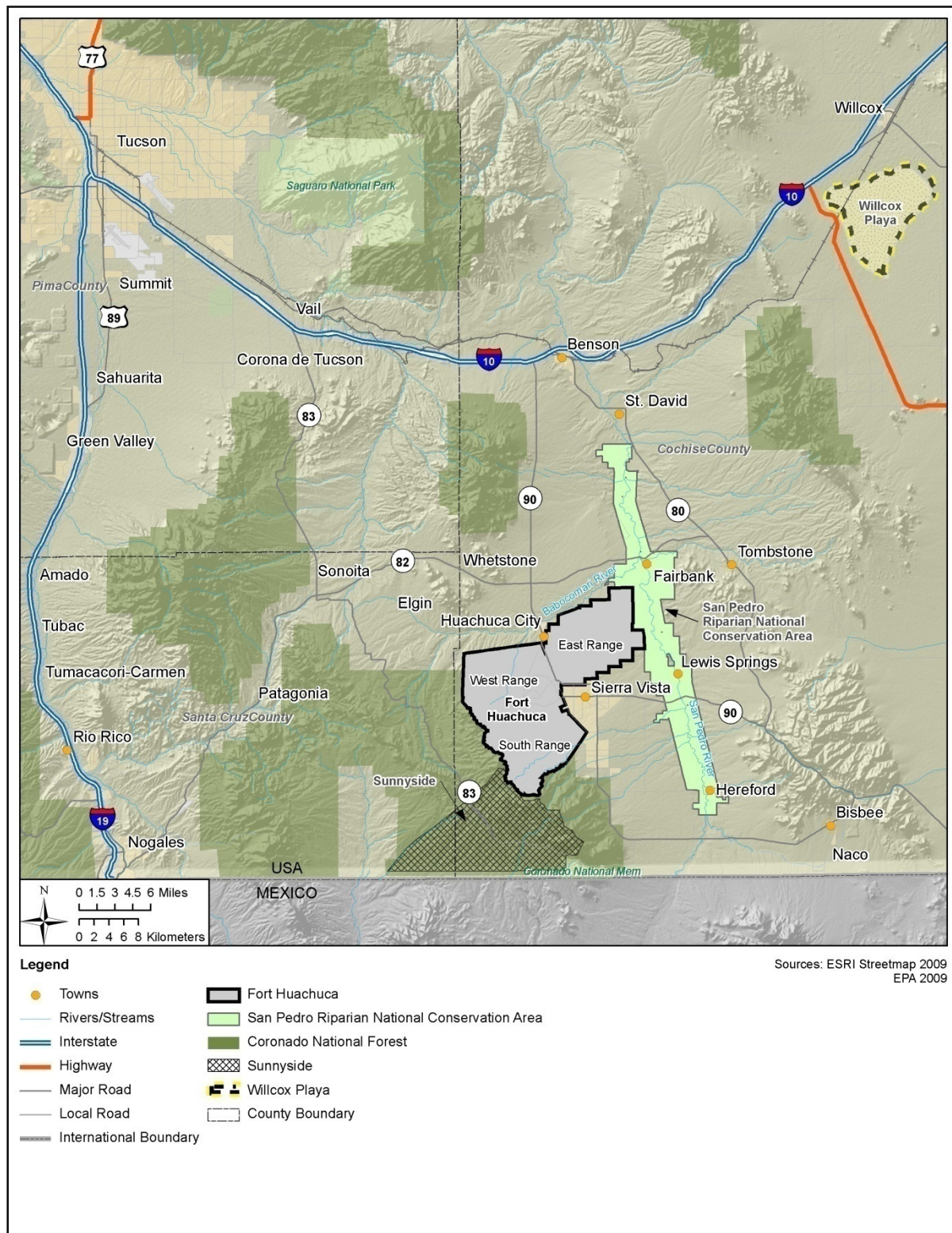


Figure 1-1. Regional Location Map

1.2 Purpose and Need for Action

The purpose of the Proposed Action is to allow the EPG and the 2-13th to use lasers on Fort Huachuca and other off-post sites in support of their testing and training requirements. A limited amount of laser testing and training has been conducted at the Fort in the past in the form of one-time and short-term activities. The environmental impacts associated with these past events were documented in Records of Environmental Consideration (RECs). The activities associated with the Proposed Action are newly acquired mission requirements for the EPG and the 2-13th and include long-term, reoccurring laser testing and training activities.

The use of lasers by these two organizations is necessary to support their military missions and allows the Army to stay technologically competitive in the development and use of lasers within the military community. The EPG is responsible for testing military equipment and systems, and the 2-13th is responsible for training Soldiers on UAS. As laser technology advances and the use of lasers by the military increases, the need for adequate laser testing facilities is important to sustaining military mission. The EPG would provide the Army with these critical test facilities at Fort Huachuca and off-post sites. Additionally, once laser systems are tested and approved for use by the Army, Soldiers must be properly trained on these lasers for use in theater and during sustainment operations. Fort Huachuca is the Army's premier UAS training facility and is the only location in the continental U.S. where Soldiers receive initial qualifying and training on the Gray Eagle UAS, which is the main laser platform proposed for use at the Fort by the 2-13th.

1.3 Regulatory Framework

Congress enacted the National Environmental Policy Act (NEPA) in 1969 with accompanying regulations requiring federal agencies to consider potential impacts before taking actions that may impact the environment. The NEPA process is not intended to fulfill the specific requirements of other environmental statutes and regulations. However, the process is designed to provide the decision maker with an overview of the major environmental resources that may be affected, the interrelationship of these resources, and potential impacts to the natural and human environment. The NEPA process:

- Integrates other environmental processes;
- Summarizes technical information;
- Documents analyses and decisions;
- Interprets technical information for the decision-maker and public;
- Helps to identify potential alternatives to the Proposed Action; and
- Assists the decision-maker in selecting a preferred action.

The NEPA is intended to be incorporated in the early stages of the decision making process to ensure that planning and decisions reflect environmental values, to avoid delays later in the

process, and to head off potential conflicts. In addition, NEPA compliance provides for ongoing evaluation of environmental effects for actions that will continue over time. Since Army training and testing requirements continuously evolve to meet changes in Army mission, many of the proposed actions identified in this PEA are conceptual or programmatic in nature.

The NEPA anticipated the need for evaluation of these broad actions by including provisions for the development of programmatic documents. Whenever a broad EA or Environmental Impact Statement (EIS) has been prepared, and a subsequent environmental document is prepared on an action included within the entire program (such as a site specific action), then, the subsequent environmental document need only summarize the issues that are specific to the subsequent action. In these cases, it is only necessary to incorporate by reference any pertinent issues that have already been covered by an approved initial document. This PEA meets the intent of the NEPA by providing:

- A programmatic document that will be used by the Installation to incorporate environmental concerns in day to day operations that include the use of lasers and future testing and training requirements that include lasers; and
- A statement of existing conditions and typical impacts that can be used to support subsequent documents under provisions of the NEPA.

In addition to the NEPA, this PEA has been prepared in compliance with two Department of the Army (DA) regulations that provide guidance for environmental analyses:

- 32 Code of Federal Regulations (CFR) Part 651, Environmental Analysis of Army Actions dated 29 March 2002, is designed to provide policy, responsibilities, and procedures for integrating environmental considerations into Army planning and decision making. It establishes criteria for determining which of five review categories a particular action falls into, and thus, what type of environmental document should be prepared. If the Proposed Action is not covered adequately in any existing Environmental Assessment (EA), PEA or EIS and cannot be categorically excluded from NEPA analysis, then a separate NEPA analysis must be completed prior to the commitment of resources (personnel, funding, or equipment) to the Proposed Action; and
- Army Regulation (AR) 200-1, Environmental Protection and Enhancement dated December 2007, describes DA responsibilities, policies, and procedures to preserve, protect, and restore the quality of the environment. The regulation incorporates a wide range of applicable statutory and regulatory requirements.

1.4 Use of this Programmatic Environmental Assessment

This PEA has been prepared as a programmatic environmental review. This approach has been taken to minimize the repetitive analysis of proposed laser training and testing activities, as well as future laser training and testing requirements that may be proposed for use at Fort Huachuca.

This PEA analyzes and documents the potential for human health and environmental impacts associated with the proposed testing and use of lasers on Fort Huachuca, and the conversion of an existing dirt taxiway to a 5,000-foot paved runway (Alternative One and Alternative Two), relative to the No Action Alternative. The Environmental and Natural Resources Division (ENRD) at Fort Huachuca will use this PEA to determine whether a Finding of No Significant Impact (FNSI) is appropriate or if a Notice of Intent (NOI) to prepare an EIS should be issued.

Training mission requirements and testing capabilities at Fort Huachuca are subject to continuous evaluation and change as new technologies, equipment, and teaching methods are implemented in support of the Installation's mission to train military personnel. Recognizing the changing nature of training mission requirements and testing capabilities, this document provides a process that can be used to guide future management decisions and determine the level of additional environmental documentation that is required for those future actions.

This PEA should be used by Fort Huachuca ENRD personnel to evaluate any future change in laser testing and training requirements, or if there is a need for a new EA, EIS or REC. If Army agencies/organizations, other than the 2-13th and the EPG, at Fort Huachuca need to conduct laser testing or training that is the same as the activities identified within this PEA, only limited additional documentation would be necessary, most likely in the form of a REC. If it is determined that there is a need for additional environmental documentation, this PEA will serve as a primary source document that can be used to reduce the level of effort required to prepare future documents.

1.5 Public Participation Opportunities

In keeping with established Army policy to provide a transparent and open decision-making process, Fort Huachuca will make this PEA and draft decision document available to applicable federal and local agencies and the general public for review and comment. A Notice of Availability (NOA) will be published in the *Sierra Vista Herald* newspaper and a copy of the PEA will be made available to the general public on the internet at <http://www.army-nepa.info> and at the following library:

Sierra Vista Public Library
2600 E. Tacoma Street
Sierra Vista, Arizona 85635

Comments must be postmarked within 30 days of the publishing date of the NOA to be considered during the NEPA process. Comments should be submitted to:

Betty Phillips, NEPA Coordinator
3040 Butler Road, Building 22526
Fort Huachuca, Arizona 85613
Fax: (520) 533-3043

A final decision document in the form of a FNSI or a NOI to complete an EIS will be issued upon completion of the 30-day review period.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Three alternatives are considered in this PEA: Alternative One (Proposed Action), Alternative Two, and the No Action Alternative.

2.1 Alternative One (Proposed Action)

Alternative One is presented as the Proposed Action, meaning that it is the preferred course of action by the EPG and 2-13th. Alternative One includes all of the proposed laser technology testing and training activities and proposed locations needed by the EPG and 2-13th to carry out anticipated mission requirements and includes a variety of laser technologies, locations, testing and training activities, and additional supporting infrastructure.

Implementation of the Proposed Action would assist the EPG and the 2-13th in meeting their training and testing necessary to support their military mission, including testing of laser systems and training Soldiers on the operation and maintenance of UAS laser systems. Because the Proposed Action includes the use of several classes of lasers at multiple locations, the EPG and the 2-13th would have increased options for conducting testing and training operations. A brief description of each of these proposed action components are presented below.

2.1.1 Laser Technology

The term “laser” is an acronym for Light Amplification by Stimulated Emission of Radiation. Laser devices work by amplifying light and radiating single-color light beams through the stimulation of atoms. Unlike ordinary visible light, the photons of light generated by lasers are coherent and the photons are all on the same wavelength (monochromatic), creating a single beam of light. Lasers surround us in everyday life. They can be found in computer CD-readers, DVD players, and video gaming consoles. Lasers are also commonly used in the medical field to perform surgeries and in industrial settings during the manufacture of everything from computer chips to automobiles.

Lasers can be generated using many different methods, using various lasing mediums, and resulting in laser beams with a variety of different intensities, colors, and applications. Depending on their wavelength, lasers may be visible or invisible (ultraviolet or infrared). The only type of laser proposed for use on Fort Huachuca is the solid state laser. Solid state lasers are lasers that use a solid gain medium or host material, rather than a liquid or gas.

All types of lasers, including solid state lasers, are categorized into classes: 1, 1M, 2, 2M, 3a, 3b, and 4. The class of a laser is determined by its potential for causing biological damage and is based on calculations of the energy of the laser beam, the wavelength of the emitted radiation, and the exposure time. These calculations are used to determine a factor defined as the Accessible Emission Limit (AEL), which is the mathematical product of the Maximum Permissible Exposure limit (MPE) provided in the American National Standards Institute (ANSI) Standard (Z136.1-2007), and an area factor computed from the defined term called the Limiting

Aperture (LA). The ANSI Z136.1 Standard (LIA 2007) is the industry standard specific to laser use. The ANSI Standard classifies lasers based on the following AEL thresholds:

- **Class 1:** Considered to be incapable of producing damaging radiation levels during operation, and exempt from any control measures or other forms of surveillance.
- **Class 1M:** Considered to be incapable of producing hazardous exposure conditions during normal operation unless the beam is viewed with an optical instrument such as an eye-loupe (diverging beam) or a telescope (collimated beam), and exempt from any control measures other than to prevent potentially hazardous optically aided viewing; and is exempt from other forms of surveillance.
- **Class 2:** Emits in the visible portion of the spectrum (0.4 to 0.7 μm), and eye protection is normally afforded by the aversion response.
- **Class 2M:** Emits in the visible portion of the spectrum (0.4 to 0.7 μm), and eye protection is normally afforded by the aversion response for unaided viewing. However, are potentially hazardous if viewed with certain optical aids (e.g. binoculars and telescopes).
- **Class 3a:** Are potentially hazardous under some direct and specular reflection (reflection off of smooth surface such as a mirror or calm water) viewing condition if the eye is appropriately focused and stable, but the probability of an actual injury is small. This laser will not pose either a fire hazard or diffuse-reflection (reflection off of a rough surface such as clothing or a roadway) hazard.
- **Class 3b:** May be hazardous under direct and specular reflection viewing conditions, but is normally not a diffuse reflection or fire hazard.
- **Class 4:** Is a hazard to the eye or skin from the direct beam, and may pose a diffuse reflection or fire hazard. They require the highest level of personal protective equipment (PPE).

For purposes of this PEA, Class 1 and Class 1M lasers will collectively be referred to as Class 1 lasers. Also, Class 2 and Class 2M will collectively be referred to as Class 2.

Laser testing and training would be conducted via ground and air operations within established on-post and off-post sites. Laser operations may be conducted during the day or night, depending on the type of laser being used. Laser testing and training would include the use of lasers on towers, ground vehicles, Soldier weaponry, other ground-based platforms (i.e. remote or unmanned ground vehicles), aerostats (East Range only), air vehicles (manned or unmanned), and lighter-than-air vehicles. Laser testing and training activities would include stationary and mobile targets at ground-level. There will be no laser testing or training activities that include lasing from the ground to an aerial target. The following is a representative list of the lasers/laser systems proposed for use at the Fort:

- Laser designators, which are near infrared, invisible lasers used to guide “smart munitions” to their targets. These lasers are typically Class 4.

- Invisible tactical laser pointers or illuminators may be used to point out a target or other item of interest. They are invisible to the human eye, but visible when using night vision goggles. These lasers are typically Class 3b, but can also be Class 3a or 4.
- Visible tactical lasers may be used to point out a target or other item of interest. They may be mounted on weapons and used as aiming devices. They are typically Class 3b, but may also be Class 3a or Class 4.
- Laser range finders, which are almost always invisible lasers, are typically Class 1 lasers. Older laser range finders may be Class 3a or 3b.
- Communications lasers are almost always invisible Class 1 lasers, but may be Class 3a. These lasers are point to point and are each other's target.
- UAV-mounted laser systems, such as the extended range multipurpose (ER/MP) system, multi-mission optronic stabilized payload (MOSP) 3000 system, and the Israel Aerospace Industries (IAI) pod. These systems are designed to be mounted to specific UAV including the MQ-1C Gray Eagle, MQ-5B Hunter, RQ-7B Shadow, and MQ-1 Warrior-A. These laser systems are Class 4.

2.1.2 Laser Technology Regulatory Oversight

The Center for Devices and Radiological Health (CDRH) is a regulatory bureau within the U.S. Food and Drug Administration (FDA) of the Department of Health and Human Services. Congress chartered the CDHR to standardize the performance safety of manufactured laser products. All laser products that were manufactured and entered into commerce, after August 2, 1976, must comply with the CDHR regulation known as the Federal Laser Product Performance Standard (FLPPS), which is identified as 21CFR subchapter parts 1040.10 and 1040.11. The FLPPS assigns lasers into classes in a manner similar to the ANSI Standard. Lasers and laser systems manufactured or marketed in the U.S. for the Army are required to comply with all provisions of the FLPPS unless the laser system is exempt. The FLPPS also does not apply to Class 1 lasers.

To be eligible to use the military exemption, the laser system must meet all of the following criteria:

- The laser system is owned and used exclusively by the DoD;
- The laser system being acquired/purchased is designed for actual combat or combat training, or is classified in the interest of national security; and
- The laser system is unable to comply with the FLPPS due to mission requirements (e.g., an illuminated firing indicator could compromise camouflage).

If all three eligibility requirements are met, then the manufacturer of the laser is responsible for requesting the use of the military exemption from the DoD procuring agency. FLPPS requirements that could not be met must be justified and alternate controls may be required. All FLPPS requirements that will not have a negative impact on the mission must be met by the laser system prior to sale to the U.S. Army. For a laser system to be sold/delivered using the

military exemption, the laser manufacturer must receive an exemption notification letter from the DoD procuring office granting the use of the military exemption for the product. By law, a laser must be labeled with either a label stating it is compliant with the FLPPS or is exempt under the military exemption. Military-exempt lasers/laser systems cannot be resold by the DoD to any other office or person(s) unless they are brought into full compliance with the FLPPS, labeled as such, and registered with the FDA. Typically, DoD exempt laser systems are destroyed after their useful life has ended (USAPHC undated).

The Proposed Action may include the use of military-exempt lasers, which would be required to meet the criteria previously described and comply with all other components of the exemption. All other lasers proposed for use by the Fort would be required to comply with the FLPPS.

2.1.3 Locations of Proposed Laser Technology Testing and Training Activity

Fort Huachuca personnel from the EPG and 2-13th evaluated training and testing areas on and off-post to determine which training areas may be compatible with the laser systems proposed for use. As part of the Proposed Action:

- Class 1-4 lasers are proposed for use on the East Range and Blacktail Test Facility;
- Only Class 1 lasers are proposed for use on the West Range and Sunnyside;
- Class 1 and aerial-to-ground Class 2-4 lasers are proposed for use at Willcox Playa;
- Class 1 lasers are proposed for use on the South Range; and
- Class 2, 3a, and 3b lasers are proposed for use on Ranges 6, 8, 9, and 10 of the South Range (Figure 2-1).

Due to the nature of EPG testing activities, no specific target or operational sites can be identified at this time, and the Proposed Action is inclusive of laser technology testing in accordance with the ranges identified above, subject to subsequent site-specific human health and environmental safety review (see *Section 2.1.5*). Activities of the 2-13th involving the use of laser technology are more predictable at this time with anticipated target sites and flight routes identified on Figure 2-2.

2.1.4 Laser Range Standard Operating Procedures

The EPG and the 2-13th would use lasers in accordance with the procedures outlined in the Laser Range Standard Operating Procedures (SOP) (USAGFH 2012), which is included as Appendix A. The Laser Range SOP applies to all military, civilian, and contractor personnel operating on Fort Huachuca. As specified in the Laser Range SOP, all requests for laser range scheduling will be made at least 30-days in advance, and must be accompanied with a thorough Composite Risk Management (CRM) Worksheet (DA Form 7566), and an Operations Order or scenario depicting the scope of the operation and all safety procedures being utilized, as well as laser class and fact sheets. All laser testing and training, with the exception of activities conducted at Blacktail Test Facility and Sunnyside, will be coordinated with the Range Control Office. The Blacktail Test Facility is a self-contained, isolated testing area on Fort Huachuca and

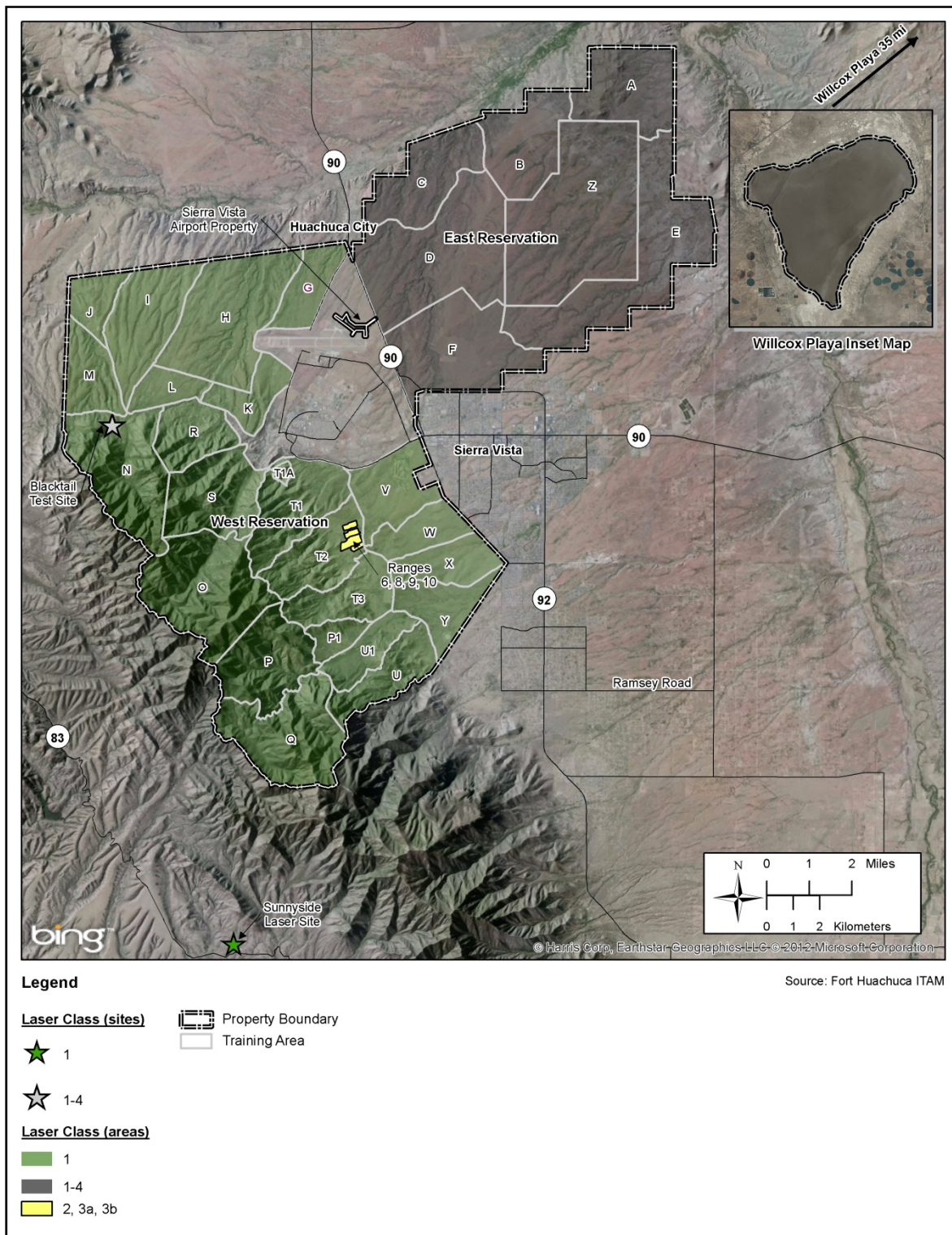


Figure 2-1. Laser Classes Proposed for Use at Designated Testing and Training Areas.

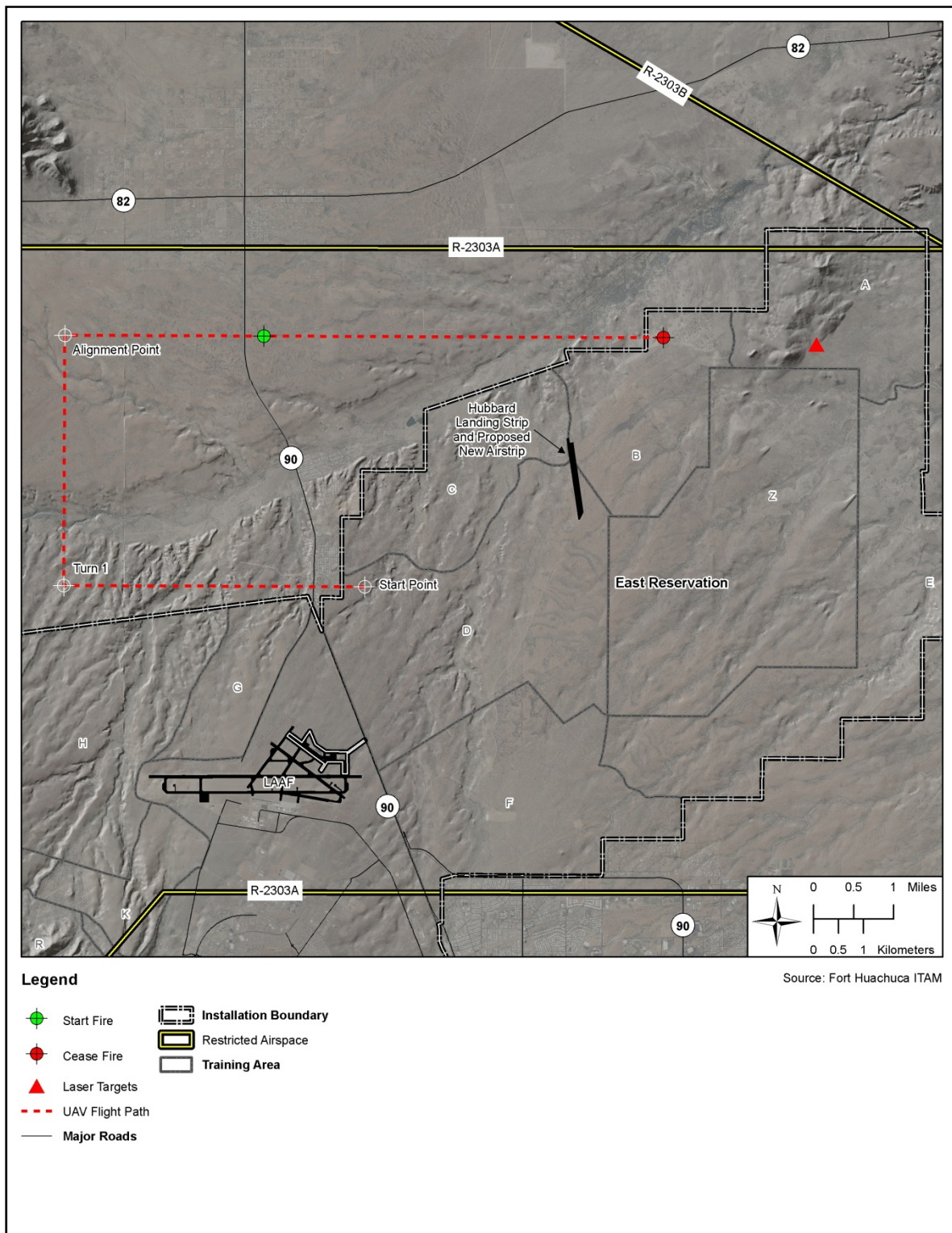


Figure 2-2. Proposed 2-13th Laser Training Flight Path and Target Site.

Sunnyside is property southwest of the Fort that is leased by the Fort from the U.S. Forest Service. Testing at both of these sites is managed by the EPG. Additionally, all aircraft laser training and testing activities will be coordinated with LAAF.

Areas within the East, South, and West Ranges, Blacktail Test Facility, Sunnyside, and Willcox Playa will be evaluated for feasibility of increased training and testing capabilities. Training and testing will be conducted based on technical practicability and environmental considerations specific to each of these areas in accordance with an established site-specific human health and environmental safety review process (see *Section 2.1.5*). In the event that future laser technology testing or training operations fall outside the analysis contained within this PEA, additional environmental analysis and documentation may be necessary.

2.1.5 Site-Specific Environmental and Human Health and Safety Review

As described in *Section 2.1.4*, all requests for laser range use must be coordinated at least 30-days in advance through the Range Control Office, in accordance with the Fort's Laser SOP. The only exceptions to this process are laser testing activities conducted at the Blacktail Test Facility and the Sunnyside testing site, which are both directly managed by the EPG. In addition to following the Laser SOP scheduling process, all testing and training activities not specifically addressed within this EA will receive a site-specific environmental and human health and safety review. When the Range Control Office receives a request for laser range use, the ENRD will be contacted and provided with the details of the proposed laser range use, including but not limited to, what organization made the request, the proposed dates and times of the laser activities, the location of the proposed laser activities, and what type and quantity of laser is being proposed for use. Based on this information, the ENRD will determine whether the requested range use requires additional environmental review and/or NEPA analysis. The ENRD should provide the Range Control Office with a timely response to avoid scheduling conflicts and delays of the proposed testing and training.

Only Class 1 laser use is proposed for the Sunnyside testing site. Additionally, this small off-post site is located in a remote area, secured by fencing, and all laser testing would be confined to the site. The Blacktail Test Facility is a 5-acre, highly secured testing facility located in an isolated area of the West Range. Proposed laser use at the Blacktail Test Facility involves Class 1-4 lasers, however all activities would be confined within the boundaries of the facility. The laser activities proposed for use, as described within this EA, at the Blacktail Test Facility and Sunnyside testing site would not require additional environmental review.

2.1.6 Additionally Required Infrastructure

A new training site will be created by the conversion of part of a dirt taxiway to a paved asphalt runway located adjacent to Hubbard Airstrip on the East Range. The runway would be 5,000-feet (ft) long and 100-ft wide, with 250-ft of overrun at each end of the runway, and an approximately 28,000 square-foot (sf) apron and 7,500-sf taxiway between the apron and runway. The runway would be used by unmanned aerial vehicles (UAVs) only. A 4,000 sf

aircraft weather covering would also be constructed along the apron. The aircraft covering would be a metal-sided and roofed structure on a concrete slab. The structure would have a roof-mounted solar panel to provide electricity and a composting toilet, with no need for the installation of new utility lines or extensions from existing utility lines. Security fencing would be constructed around the aircraft covering. The structure would provide temporary cover for aircraft and personnel when on-site maintenance of UAVs was necessary. The structure would not permanently house any UAVs, equipment, tools, or any hazardous materials or waste.

2.2 Alternative Two

Under Alternative Two, all classes of solid state lasers would be used as described in *Section 2.1*, but would be limited to the East Range, South Range, and Blacktail Test Facility. Testing and training activities utilizing laser technologies would not be conducted on the West Range, Sunnyside, or Willcox Playa. This Alternative includes the conversion of the taxiway to runway as described in *Section 2.1.6*. This Alternative would allow for necessary testing and training to support the EPG and the 2-13th's military missions; however it significantly decreases the amount of available training and testing areas. Restricting the use of lasers to the East Range, South Range, and Blacktail Test Facility could result in more scheduling conflicts between the new laser training and testing and current testing and training activities that occur on the Fort. These conflicts could impact the EPG or the 2-13th's missions by delaying necessary tests and/or Soldier training.

2.3 No Action Alternative

The No Action Alternative is required under the Council of Environmental Quality regulations implementing the NEPA, and serves as a baseline or benchmark to be used to compare with the Proposed Action and Alternatives. Under the No Action Alternative, current testing and training would continue, with laser use being evaluated on a one-time or limited use basis that would be covered under subsequent environmental analysis such as a REC or other process as necessary. If limited to the existing level of training and testing, the EPG and 2-13th would not be able to meet their military missions.

2.4 Alternatives Considered but Eliminated from Further Analysis

Two alternatives were considered but eliminated from further analysis within this PEA.

The Army considered the use of lasers on Fort Huachuca without the construction of the new runway adjacent to Hubbard Airfield. However, this alternative was eliminated from further analysis because the runway is essential to the 2-13th's laser training mission. If the runway is not constructed, the 2-13th would not be able to conduct necessary laser training with the UAS being used at Fort Huachuca.

The Army also considered the use of all classes of lasers at Willcox Playa. However, a site visit was conducted by the EPG and Range Control during the week of August 13, 2012. As a result of the site visit, it was concluded that due to the flat, open nature of the site, ground based laser

use would be limited to Class 1 lasers only, Class 1 to 3b aerial to ground laser use would be limited, and Class 4 aerial to ground laser use would be very limited.

FORMAT PAGE

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Section 3 describes conditions of, and possible impacts to, environmental resources potentially affected by the Proposed Action and Alternatives. The description of existing conditions provides a baseline understanding of the resources from which any changes that may be brought about by the implementation of an alternative can be identified and evaluated.

Following the description of environmental resources potentially affected, the potential changes or impacts to the resources are then described as environmental consequences. As stated in Council on Environmental Quality (CEQ) Guidelines, 40 CFR 1508.14, the "human environment potentially affected" is interpreted comprehensively to include the natural and physical resources and the relationship of people with those resources. The term "environment" as used in this report encompasses all aspects of the physical, biological, social, and cultural surroundings. In compliance with guidelines contained in NEPA and CEQ regulations, the description of the affected environment focuses only on those aspects potentially subject to impacts.

Finally, cumulative impacts for each resource area are addressed. Cumulative impacts are defined in the CEQ regulations (40 CFR 1500-1508) as those impacts attributable to the Proposed Action combined with other past, present, or reasonably foreseeable future impacts regardless of the source. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. However, in order to be considered a cumulative impact, the effects must:

- Occur in a common locale or region;
- Not be localized (i.e., they would contribute to effects of other actions);
- Impact a particular resource in a similar manner; and
- Be long-term (short-term impacts would be temporary and would not typically contribute to significant cumulative impacts).

Analysis of cumulative impacts requires the evaluation of a broad range of information that may have a relationship to the Proposed Action and Alternatives. A good understanding of the politics, sociology, economics, and environment of the region are key to this analysis, as is an accurate evaluation of factors that contribute to cumulative impacts.

3.1 Land Use

3.1.1 Affected Environment

3.1.1.1 On-post

Fort Huachuca Military Installation is located in the City of Sierra Vista, in the southwestern portion of Cochise County, Arizona. The Installation is operated by the Installation Management Command (IMCOM) West and is home to many tenants, including the EPG and the 2-13th Aviation Regiment.

The Installation encompasses 73,142 acres, which is divided into the East Reservation (28,544 acres) and the West Reservation (44,598 acres) by State Highway 90. Land uses within these two reservations are generally classified as either open/operational or developed areas. The ranges are further divided into 32 training areas depicted with alpha numeric assignments as shown in Figure 3-1. The East Reservation includes the East Range and multiple THE EPG test facilities including the open air antenna testing range, Hubbard Landing Strip and the Convoy Live Fire Range (CLFR).

The West Reservation includes the West Range, South Range, Cantonment Area, LAAF, the Black Tower aviation complex, multiple Military Operations on Urban Terrain (MOUT) sites, and numerous electronics testing sites such as the E3 Test facility. Figure 3-1 shows the location of the Cantonment Area, each of the ranges, LAAF, Black Tower Complex and the Hubbard Landing Strip.

To help ensure compatible land uses between on-post military activity and surrounding development, a Joint Land Use Study (JLUS) was developed through a collaborative effort between Fort Huachuca and other stakeholders. The study was finalized in June 2007. Compatible land use agreements between all stakeholders are accomplished using a cooperative program of affected jurisdictions in Cochise and Santa Cruz counties that have the authority to implement land use regulations, along with Fort Huachuca and other interested parties (JLUS 2007). The JLUS identified operations occurring at the Installation that extend beyond the boundaries of the Fort and into the surrounding communities, including the potential for an increased need to demonstrate and test new laser technologies.

East Range

Figure 3-1, Training Areas Map, shows the East Range which makes up the entire East Reservation and covers 28,544 acres of land. Approximately 13,463 of these acres consist of public domain land that has been withdrawn from public use for military purposes pursuant to the Order of the Secretary of Interior (Public Land Order 1471, 22 August 1957). The Resource Management Plan of the Safford District of the Bureau of Land Management identifies this land as being managed for military purposes and provides for resource management coordination with the Fort consistent with the requirements of the Federal Land Protection and Management Act (FLPMA) (BLM 1991).

The East Range is divided into Training Areas Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, and Zulu. A demolition range, CLFR, a tactical assault landing strip, impact area, and six Drop Zones (DZ) are located within the training areas on the East Range. When live-fire exercises occur, training events can be restricted in training areas Alpha, Echo, Delta and Bravo, depending on the exercise. Impact Area Zulu is a 6,954-acre plot that was historically used for various types of self-propelled artillery and mortars and is always closed to training activities other than CLFR (USAGFH 2009b). Weapons, intelligence training, and electronics testing in Impact Area Zulu is restricted to existing roadways, even for pedestrian traffic.

West Range

The West Range (Figure 3-1), which includes approximately 16,000 acres, is located in the West Reservation, and is used primarily for intelligence training and equipment testing. Activities include tactical training, UAS operations at the Black Tower complex, and electronics and communications testing. There are no live-fire ranges located on the West Range. Special use regulations apply for training conducted in portions of the West Range where protected agave management areas are located. Some areas of the West Range are restricted for special status species wildlife habitat management and outdoor recreational activities.

The West Range is divided into Training Areas Golf, Hotel, India, Juliet, Kilo, Lima, Mike, November, Romeo, and Sierra. Training activities that occur on the West Range include intelligence and communications training and testing activities; patrolling and tactics training; land navigation; setting up bivouacs containing sleeping, mess, and other related facilities for the execution of field training exercises; helicopter landing; and recreational activities including hiking, horseback riding, picnicking, and hunting. The Black Tower Unmanned Aerial Systems Training Battalion (UASTB) Complex is located in Training Area Juliet.

South Range

The South Range, which includes approximately 23,000 acres, is located in the West Reservation, (Figure 3-1) and is primarily used for intelligence training and equipment testing. The South Range contains the majority of small arms firing ranges and is used for various training exercises, such as rappelling and land navigation. Some areas of the South Range are restricted for special status species and other wildlife habitat management and outdoor recreational activities.

The South Range is divided into Training Areas Oscar, Papa, Quebec, Tango, Uniform, Victor, Whiskey, X-Ray, and Yankee and also includes firing ranges and several impact areas. Training activities that occur on the South Range include land navigation; intelligence and communications training and testing activities; patrolling and tactics training; setting up bivouacs containing sleeping, mess, and other related facilities for the execution of field training exercises; live fire training; helicopter landing; and recreational activities including picnicking, hunting, and golf (USAGFH 2009a).

A U.S. Air Force (USAF) Aerostat Surveillance Balloon became operational in the southern portion of the South Range in 1987. The blimp-type balloon is ground tethered and is an aerial platform for radar equipment used to detect low-flying aircraft illegally entering the U.S. (USAGFH 2009b). The radar data is for U.S. Customs, the DoD, and the Federal Aviation Administration (FAA). This system is in operation within approximately 23 acres of the South Range. Airspace within certain portions of the South Range is restricted for aerostat activities only (USAGFH 2009b).

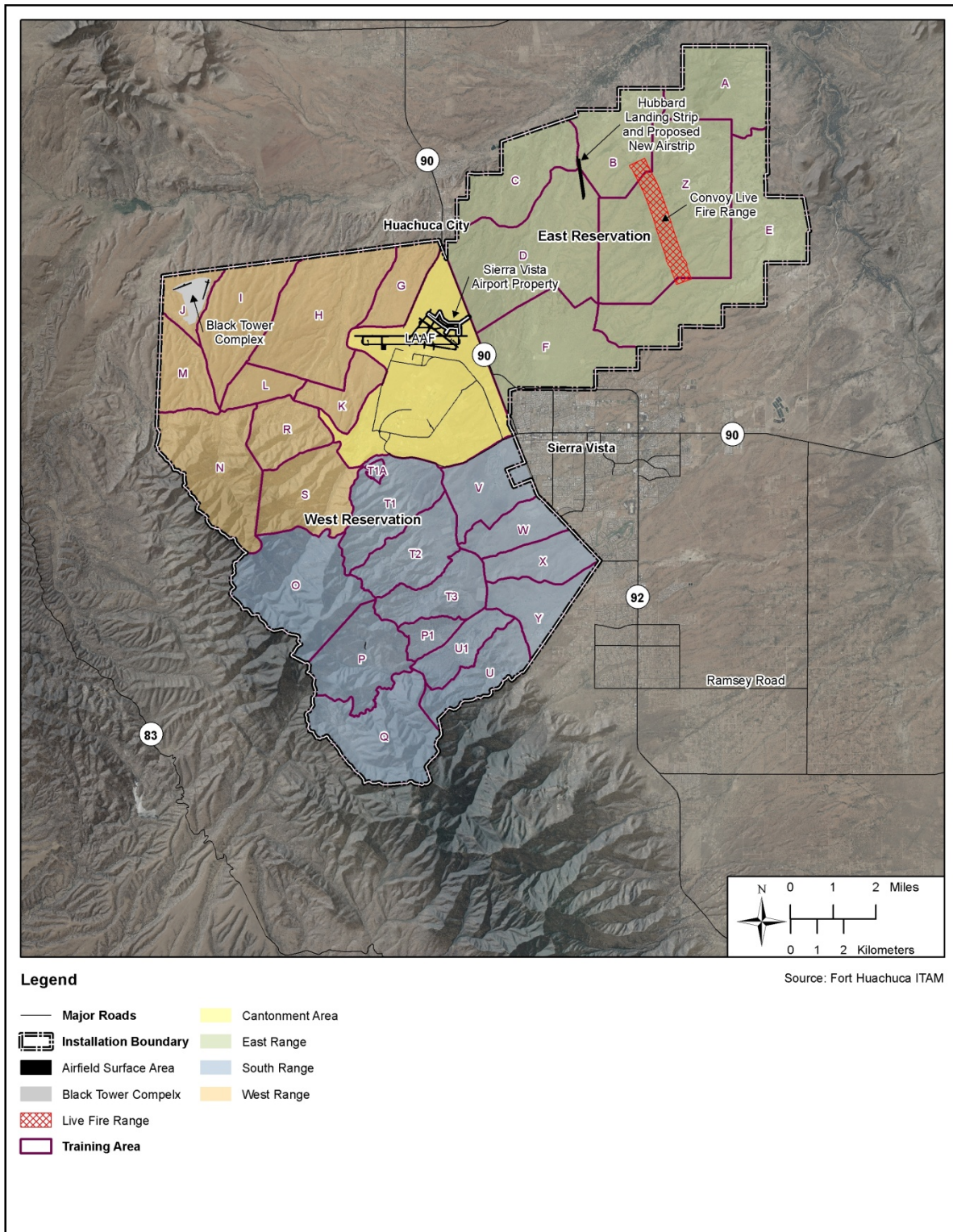


Figure 3-1. Training Areas Map

3.1.1.2 Off-post

Although the EPG conducts a great deal of their EM testing within the bounds of Fort Huachuca, other tests require a wider geographic dispersion than can be accomplished on the 73,000 acre Installation. The EPG leases larger off-post test sites, including Sunnyside and areas within the Willcox Playa.

Sierra Vista is the largest city in Cochise County, encompassing 139 square miles, including the 114 square miles that make up Fort Huachuca. Outside the Installation, Sierra Vista is urbanized and is near complete build-out. The City of Sierra Vista and Cochise County signed a Joint Planning Agreement in 2002 and incorporated the Agreement into the City's Vista 2020 General Plan, which guides future development within the City (JLUS 2007). Huachuca City is located in southwest Cochise County and borders Fort Huachuca to the north and east. The County of Santa Cruz is located to the west of Fort Huachuca and is the smallest county in Arizona. Overall, development in the county has mostly been along the Santa Cruz River and development trends indicate that future development will be limited, leaving most of the County as open space (JLUS 2007). The Coronado National Forest, which includes a leased training area known as Sunnyside, is located to the southwest of the Installation.

Land use is typically governed by the county or municipality in which it occurs. In some cases, land use is further defined by plans specific to a limited geographic area, which is often seen in the case of land grants in Southeast Arizona. Agencies and entities controlling land also have the authority to regulate land use, including the Department of Defense, Fort Huachuca, Bureau of Land Management, U.S. Forest Service (USFS), State Lands, etc. The types of planning vehicles that may direct land use include comprehensive plans, general plans, specific plans, and studies that address specific issues in a given area such as the Joint Land Use Studies that have been prepared for Pima and Cochise counties.

Sunnyside

The Sunnyside area is located southwest of the Fort, and includes portions of the Coronado National Forest. The location of the Sunnyside area provides an extremely quiet EM environment as it is shielded on the north by the Huachuca Mountains. The Sunnyside area also benefits from the lack of development on the National Forest lands. The Fort, through a use agreement with the Department of Agriculture, uses several sites within the Sunnyside area for certain testing and training requirements (JLUS 2007). The Sunnyside testing site proposed for laser use is approximately 250 ft. by 300 ft. and is located at the intersection of Montezuma Canyon Road and W. Lochiel Road (Figure 3-1). The site is fenced and contains no permanent structures. It is used by the EPG for other testing activities.

Willcox Playa

Willcox Playa is BLM land permanently withdrawn for military purposes. It is leased and managed by Fort Huachuca to support the capacity and capability of EM infrastructure. Once

known as the Willcox Dry Lake Bombing Range, Willcox Playa is now an extension of Fort Huachuca's long range testing capability with several receiving/transmitting facilities operated by the Fort (JLUS 2007). Covering 27,397 acres, Willcox Playa is located roughly 40 miles northeast of Fort Huachuca, near the town of Willcox, Arizona (Figure 1-1).

3.1.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to result in any significant direct or indirect impacts to land use either on Fort Huachuca or off-post.

Utilization of on-post test sites located within training areas is scheduled through the Fort Huachuca Training Division of the Directorate of Plans, Training, Mobilization, and Security (DPTMS) using a Range Facility Management Support System (RFMSS). Through RFMSS, the Fort Huachuca Training Division can schedule and monitor range utilization to reduce military testing-related incompatibilities and conflicts amongst the military community. The RFMSS also allows the Training Division to restrict training areas from recreational or non-military activities during testing events. While the potential exists for the EPG laser testing activities to impact training area utilization by other military tenants and organizations, these impacts are minor and managed according to standing mission prioritization guidelines, with access to the training area controlled by RFMSS. Short-term restriction of training area access for recreational and other non-military uses (e.g. Army land managers or DoD research contractor activities) will occur during some EPG testing activities. This short-term restriction may limit access to hiking trails, hunting areas, and other recreational amenities but would not result in a change to land use within Fort Huachuca training areas.

The EPG testing activities at Willcox Playa and Sunnyside area operate under land leases that stipulate use and operating conditions and do not permanently affect land uses. While the long-term and 24-hour use of these sites may limit public access to portions or all of these areas during testing events, such use restriction is minor and managed by the land owner in cooperation with the EPG.

Under the Proposed Action, the use of lasers by the 2-13th would be incorporated into their existing training activities. There would be little to no increase in the amount of UAS training activities as a result of the Proposed Action. The UAS training would continue to use current flight patterns or require slight modifications to flight patterns. However, no new airspace use would occur, as all of the UAS platforms proposed for laser activities are already in use by the Fort, utilizing existing airspace. The RFMSS deconflicts training activities on training ranges and minimizes training-related land use conflicts. The addition of laser use to the UAS systems is not anticipated to result in any significant training-related land use impacts.

Although the development of the new training site on the East Range would result in the conversion of the taxiway to a paved runway and include the construction of an aircraft covering

structure, no significant change in land use would occur. This area is already used by UAS as a taxiway. Development of this site would result in increased training area, which is expected to reduce potential training-related conflicts by providing additional UAS training space.

Alternative Two

Land use impacts under Alternative Two are anticipated to be similar but less than those associated with the Proposed Action. Alternative Two eliminates the EPG laser testing activities off-post and on the West Range; therefore, eliminating any potential direct, off-post land use impacts. On-post land use impacts would be identical to the Proposed Action, with the exception of the elimination of West Range use, and are anticipated to be less than significant.

No Action Alternative

Under the No Action Alternative, the EPG's utilization of on- and off-post test sites would continue as status quo. There have been no identified significant impacts to land use resulting from the past 57 years of EPG testing activity at Fort Huachuca and within the region (USAGFH 1992, USAIC & FH 1993, USAEPG 1997a, USAEPG 1997b).

Additionally, training activities conducted by the 2-13th would continue at current levels and the development of the new training area runway on the East Range would not occur.

No impacts to land use are anticipated under the No Action Alternative.

Cumulative Impacts

Continued regional coordination between Fort Huachuca and off-post stakeholders will encourage compatible land uses on and around the Installation.

None of the alternatives are anticipated to contribute to cumulative impacts on land use at the local, regional, or statewide level.

3.2 Topography, Geology, and Soils

3.2.1 Affected Environment

3.2.1.1 On-post

Topography

Fort Huachuca is located in the Mexican highland section of the Basin and Range Physiographic Province. The landscape consists of isolated mountain ranges and broad, relatively flat valleys or basins. The mountains are of fault-block origin and linear orientation and range from Precambrian to Cretaceous time periods. The Huachuca Mountains, which trend northwest to southeast, run through parts of Fort Huachuca while the remainder lie southwest of the Installation and the Whetstone Mountains are situated northwest of Fort Huachuca on the

north side of the Babocomari River (USACE 2008). Elevations at Fort Huachuca range from approximately 3,925 feet above mean sea level (amsl) in the northeast corner of the East Reservation near the San Pedro River to about 8,625 feet amsl at the crest of Sheelite Canyon in the Huachuca Mountains. Within the Cantonment Area the elevation is approximately 5,050 feet amsl. Steep slopes in the Western Reservation transition to gradual slopes toward the San Pedro River east of the Installation (USACE 2008).

This part of Arizona experiences periodic heavy rains that create dry washes known locally as arroyos. The Cantonment Area also is relatively flat and has a slope of roughly two percent, but this area is surrounded by foothills to the west with slopes of 35 degrees and mountains beyond the foothills with slopes over 50 degrees. Deeply incised ephemeral stream beds flow out of the mountains and across the Cantonment Area toward the San Pedro River and Babocomari River (USACE 2008).

Geology

The unconsolidated and semi-consolidated sediments of the Upper San Pedro River Basin (USPB) consist of three layers. The lowest unit is a thick, cemented conglomerate (Pantano Formation) that is overlain by the lower basin fill unit, composed of weakly to strongly cemented layers of interbedded sandy clay, silty sand, and sandy gravel. This layer is approximately 235 feet thick in the Fort Huachuca well field. The upper basin fill unit in the vicinity of the Fort consists of very permeable, flat-lying layers of weakly compacted clay, gravel, sand, and silt of middle to late Pleistocene age that is approximately 650 feet thick. When combined, the upper and lower basin fill units form the USPB's principal groundwater reservoir. The floodplain alluvium overlying the upper basin fill in the San Pedro River Valley is composed of highly permeable unconsolidated gravel, sand, and silt. Although limited in extent, the alluvium seems to play an important role in sustaining the flow of the Upper San Pedro River (USAGFH 2004).

The Huachuca Mountains along the southwestern edge of the Installation are comprised primarily of granitoid and sedimentary rocks. Further to the west, the composition of the Huachuca Mountains consists of sedimentary rocks with volcanic units (ADWR 2005).

The Huachuca fault zone occurs just west of the San Pedro River between the International Border and Arizona State Highway 90. The most recent rupture associated with this fault occurred 100,000 to 200,000 years ago. The fault displaces lower and middle Pleistocene alluvial-fan deposits, but the upper Pleistocene and Holocene deposits are not faulted (Pearthree 1996).

Soils

Fort Huachuca has a diverse assortment of soil types. This diversity is directly related to differences in climate, parent material and topography at the Installation. The soils exhibit wide variations in depth, texture, and chemical properties. Roughly 30 percent of the soils are less than two feet in depth over bedrock.

The Soil Survey of Fort Huachuca (NRCS 1997) characterizes the types of soils that occur at the installation, locations of the soil types, and potential constraints. This characterization classifies soils into one of four groups (Hydrologic Soil Groups A, B, C, and D) based upon infiltration capacity and ability to transmit water through them. Group D soil types have very slow infiltration rates when saturated and have an extremely low water transmission rate due to high percentages of clays, claypan or clay layers near the surface, or impervious bedrock near the surface. Group C soil types have moderate to slow infiltration rates when thoroughly wetted and slow water transmission rates. Storm-related runoff and stream flow are likely to occur with both Group C and D soil types. Conversely, Group A and B soil types have a high to medium (respectively) infiltration capability and water transmission rates. Fort Huachuca is dominated by soils classified in Group D with some types occurring in the Group C category, particularly on the South and West Ranges, while some of the East Range soils are classified as Group B and Group C (NRCS 2009).

Many soils in the hilly and mountainous areas, particularly on the South and West Ranges, are shallow with steep slopes; these soils tend to have a low available water capacity and are susceptible to erosion. The high sodium and gypsum contents of many soils on the East Range make these soils subject to gully erosion and piping; they also are very corrosive to concrete and steel. The soil of the Cantonment Area consists of alluvial fan soils. Almost one-quarter of the post land area has deep red clay soils that have slow permeability and tend to be poorly drained. They become very slippery when wet and are susceptible to compaction. Other properties of soils on the Installation influencing land use and management are gravelly or rocky soils, soils with hard pans and deep, droughty, sandy soils (USAGFH 2004).

The Fort actively takes measures to reduce the effects of erosion on the Installation. Some of the practices to promote grass establishment include mesquite mastication and extraction, upland revegetation, the placement of gabions and erosion control structures, prohibiting vehicle traffic on designated roads, limiting operations during periods of heavy rains and wet soils and the retirement of unnecessary roads and fire breaks. All construction disturbances in excess of one acre require a Storm Water Pollution Prevention Plan (SWPPP). Most plan components include silt fencing, water bars, limiting operations during periods of heavy rain and wet soil, and other best management practices. In addition, soils mapping, plant inventories and cooperative efforts with other federal land managers and the Natural Resource Conservation Service (NRCS) assist in monitoring and developing improved conditions across the Installation. While erosion control is a concern in all areas of the Fort, special emphasis is placed on the East Range, as this area is more prone to erosion due to soil properties and less existing vegetative ground cover. Erosion control projects help lower sediment loads, provide recharge, reduce velocity of stormwater flows and protect archaeological sites on the East Range (USAIC & FH 2006b).

3.2.1.2 Off-post

Topography

Sunnyside

Sunnyside is located to the southwest of Fort Huachuca, and includes portions of the Coronado National Forest, along with several private in-holdings. The Sunnyside test site is located on the southern side of the Huachuca Mountains, with elevations from 5800 to 5400 amsl. This area is comprised of relatively flat ridge tops and canyons that trend to the south.

Willcox Playa

The Willcox Playa is located approximately 40 miles northeast of Fort Huachuca within the upper Willcox Basin. The Playa is roughly triangular in shape, and is a nearly level alkali plain that occupies about 50 square miles of land, with an elevation of 4135 ft. The Playa floor is extremely flat, with no more than 10 inches in elevation change over the extent of the Playa (USAGFH 1997).

Geology

Sunnyside

As Sunnyside falls on the other side of the Huachuca Mountains compared with Fort Huachuca, it is expected to consist of the same geology that Fort Huachuca is. A site-specific geological evaluation of this site has not been conducted.

Willcox Playa

A consolidated layer of relatively young conglomerate, sandstone, and mudstone, as well as a mix of sand, gravel, silt, and clay comprise the Willcox Basin that the Playa falls within (USAGFH 1997). The Playa drains internally to form a closed basin that collects water from the surrounding mountains and rainfall.

Soils

Sunnyside

Soils in the vicinity of the Sunnyside test area have surface layers of gravelly loam, sandy loam, or gravelly sandy loam leading to high permeability. The area is composed of an alluvial fan with sediment being carried downstream from fast flowing streams to create the flatter plains seen in this area.

Willcox Playa

Soils found in the Willcox Playa have a surface layer of clay, sandy loam, or fine sandy loam. There is a low permeability with occasional surface crusting leading to pooling of water. These

soils tend to have high moisture content due to the amount of organic material that is in them, leaving these soils highly susceptible to rutting through natural and manmade causes, such as vehicles driving through them.

3.2.2 Environmental Consequences

Alternative One (Proposed Action)

No significant impacts to topography, geology, or soils are anticipated to occur as a result of implementing the Proposed Action.

The Fort actively takes measures to reduce the effects of erosion on the Installation. These practices include the promotion of grass establishment through mesquite mastication and extrication, upland revegetation, the placement of gabions and erosion control structures, prohibiting vehicle traffic off of designated roads, limiting operations during periods of heavy rains and wet soils, and the retirement of unnecessary roads and fire breaks.

No impacts would result from the addition of laser use to training or testing activities. Lasers would be mounted to vehicles and equipment that are already being used on-and-off-post by the Fort, and would not result in a significant increase in the amount of vehicles, equipment, or personnel utilizing dirt/gravel roadways or pathways. Therefore, no significant impacts to soils would be anticipated due to foot-traffic or vehicle and equipment traffic.

Some minor leveling and earthwork would occur during the development of the new training site on the East Range, but this earthwork would result in very little new ground disturbance since the area is already developed as a gravel taxiway. All construction disturbances in excess of one acre require a SWPPP. Appropriate storm water control and best management practices (BMPs) would be implemented during construction activities and throughout the long-term use of the site, thereby limiting erosion. These BMPs may include silt fencing, limiting construction activities during heavy rains, dust control, and/or re-seeding areas where heavy soil disturbance has taken place.

Alternative Two

Impacts to topography, geology, and soils under Alternative Two would be the same as those associated with the Proposed Action. No significant impacts are anticipated.

No Action Alternative

The No Action Alternative would not result in any impacts to topography, geology, or soils.

Cumulative Impacts

While erosion control is a concern in all areas of the Fort, special emphasis is placed on the East Range, as this area is more prone to erosion due to soil properties and less existing vegetative ground cover. The Fort is currently conducting small-scale revegetation projects

aimed at revegetating the East Range with native grasses with a long-term goal of complete restoration to native grassland (USAGFH 2012b). Based on the Fort's continued efforts to reduce erosion and the very limited amount of ground-disturbing activities associated with the Proposed Action and Alternative Two, no significant cumulative impacts to on-or off-post topography, geology, or soils are anticipated. Erosion control measures and use of BMPs during construction, testing and training activities would help ensure the stability of soils throughout the Installation and at off-post testing sites.

3.3 Hydrology and Water Resources

3.3.1 Affected Environment

3.3.1.1 On-post

Floodplains

Floodplains within Fort Huachuca are not represented on Federal Emergency Management Agency (FEMA) maps. However, available data indicates that a network of floodplains surrounds the main developed area within the Cantonment, with as many as 80 buildings on the Installation within a floodplain (USACE 2008). Most of the floodplains are located in open space, training areas, or recreation areas. The Real Property Master Plan (RPMP) identifies the need for an updated study and delineation of floodplains so that appropriate avoidance and mitigation measures can be taken to prevent issues with land development within affected areas.

Groundwater

The Arizona Department of Water Resources (ADWR) has divided the USBP into subwatersheds to better define and manage available water resources. Fort Huachuca, Sierra Vista and most of the San Pedro Riparian National Conservation Area (SPRNCA) occur within the Sierra Vista subwatershed. The boundaries of the subwatershed are the International Border on the south, Mule Mountains on the east, Huachuca and Mustang mountains on the west and State Route 82 on the north (USAGFH 2004).

The regional and the floodplain aquifers provide groundwater within the USBP. The regional aquifer is located within the upper and lower basin fill and, to a lesser extent, the Pantano Formation. The floodplain aquifer is generally recharged by stormwater runoff and discharge from the regional aquifer. In some reaches of the San Pedro River, recharge occurs through the stream channel.

Groundwater is believed to move from the valley margins towards the San Pedro River. However, an exception to this may occur near Fort Huachuca and Sierra Vista well fields where water is believed to flow towards a cone of depression where drawdowns up to 75 feet deep have been reported (USAIC & FH 2006a).

Groundwater within the USBP is potable. Wells within the basin are used to meet all the water needs of the communities within the basin, which is depleting groundwater supplies. Groundwater level declines between 1990 and 2001 for the Fort Huachuca-Sierra Vista area have averaged about 0.5 to 0.6 feet per year, while the Fort Huachuca-Huachuca City area showed a decline between about 0.1 and 0.5 feet per year (USDI and USPP 2008). Potable water quality and services are addressed in *Section 3.12, Utilities*.

The declines in groundwater have had an adverse impact on the San Pedro River and the associated riparian habitat. In an effort to reduce the impacts associated with regional groundwater withdrawal, Fort Huachuca has implemented a broad spectrum of water conservation, recharge and reuse measures (USAIC & FH 2006a). It has been estimated that on-post pumping comprises only 5 percent of the basin-wide groundwater pumping and is responsible for 31 percent of baseflow capture, 3 percent of evapotranspiration (ET) capture, and 4 percent of total storage depletion in the basin. It was also estimated that for off-post groundwater pumping, Fort Huachuca comprised 19 percent of the total pumping while providing 65 percent of total baseflow capture and 7 percent of the ET capture.

Artificial aquifer recharge is one component of this conservation program. In 2005 it resulted in the recharge of approximately 426 acre-feet (AF) of treated effluent from the Fort's Wastewater Treatment Plant (WWTP) (USAIC & FH 2006a). One AF is equivalent to 325,851 gallons; to put this volume in perspective, 426 AF is equivalent to 138,812,526 gallons of treated effluent. Stormwater recharge during 2006 was estimated at 185 AF (USDI and USPP 2008). The total net effect of all the combined efforts initiated by Fort Huachuca has reduced the net groundwater consumption by approximately 2,272 acre-feet annually (AFA) or 71 percent since 1989 (USAIC & FH 2006b).

More efficient water use is also occurring both on the Fort and in the surrounding communities. Annual pumping from Fort Huachuca production wells decreased from a high of 3,200 AF in 1989 (USAIC & FH 2006a) to a low of approximately 1,126 AF in 2008 (USAGFH 2009a). Annual pumping in 2009 was 1,222 AF (Runyon 2010). Fort Huachuca has also increased the amount of water recharged to the regional aquifer each year since 2005 through construction of effluent recharge facilities and detention basins (USAGFH 2010a).

More efficient water use has decreased the amount of water used by Sierra Vista from 191 gallons per capita per day (GPCD) in 2000 to 156 GPCD in 2005, which equates to a 2 percent decrease in pumping (USAIC & FH 2006a). The GPCD has continued to go down as 2008 records show a 105 GPCD use (Western Resource Advocates 2009).

Measures that the Fort has implemented to accomplish water efficiency and savings include fixture upgrades (e.g. replacement of high water use plumbing fixtures with low water use fixtures), facility infrastructure removal/consolidation (e.g. demolition of facilities), aggressive leak detection and repair, water conservation education, xeriscaping including the use of artificial turf, replacing natural turf areas with gravel, and implementation of a strict landscaping watering policy in the military family housing area.

The Fort has entered into agreements and partnerships with other groups and agencies for the purpose of reducing water use in the USBP. Agricultural pumping has decreased as a result of the retirement of agriculture associated with creation of the SPRNCA and through the purchase of conservation easements by Fort Huachuca in partnership with The Nature Conservancy (TNC). In addition, Fort Huachuca is an active member of the Upper San Pedro Partnership, a consortium of 21 agencies that collaborates to meet water needs in the region while protecting the San Pedro River (USACE 2008).

Surface Water

Fort Huachuca is located within the Sierra Vista subwatershed of the USBP (U.S. Geological Survey [USGS] Cataloging Unit: 15050202). The headwaters of the San Pedro River are located in Mexico. The river flows north for approximately 100 miles before converging with the Gila River. The SPRNCA encompasses approximately 40 miles of the Upper San Pedro River (USACE 2008). To the north of Fort Huachuca is the Babocomari River which sustains a perennial flow in two reaches totaling 12 miles (USDI and USPP 2008). This river drains the Mustang Mountains, Canelo Hills, and the north end of the Huachuca Mountains and carries this water to its confluence with the San Pedro River.

A majority of the surface water features on Fort Huachuca are ephemeral streams that consist of dry washes, arroyos, or continuous and discontinuous gullies. Ephemeral streams are usually dry and only flow in response to precipitation that is significant enough to achieve runoff conditions. Ephemeral streams on Fort Huachuca are typically narrow channels with a sand and gravel layer at the bottom of the channel. Some of these channels are deeply entrenched. The channels serve to carry runoff to larger drainage systems (USAGFH 2000).

Fort Huachuca has approximately 4.5 miles of perennial streams, 3.5 miles that occur in Garden Canyon and another 0.75 miles in Huachuca Canyon. Minor lengths of perennial reaches also occur in McClure and Blacktail Canyons. The perennial streams are typically fed by one or more of the Installation's 39 springs (USACE 2008). In addition, there are 16 ponds covering approximately 32 acres on Fort Huachuca. Most of the ponds are dry and only retain water during heavy rains. No surface water is used to meet Fort Huachuca's water needs.

The alluvial fans south of the Babocomari River Valley within the West Range are dissected by three major drainages: Blacktail Canyon, Slaughterhouse Canyon and Huachuca Canyon. Within the East Range, the primary drainage is Soldier Creek. These drainages are intermittent and flow in response to rainfall. Huachuca Canyon Creek serves as a major stormwater interceptor for Huachuca Canyon and the Fort's Cantonment Area (USAGFH 2004).

3.3.1.2 Off-post

Floodplains

Neither Sunnyside nor Willcox Playa are represented on FEMA floodplain maps. However, as Willcox Playa is a dry lakebed that floods from runoff, it should be considered to be part of a floodplain.

Groundwater

Sunnyside is part of the Sierra Vista subwatershed of the USBP. As such, the water that flows through Sunnyside is expected to act in the same manner as that found on Fort Huachuca, with water flowing towards the San Pedro River.

The Willcox Playa is part of the Willcox Basin, an area that contains both the most overall groundwater demand in the planning area and the most groundwater demand for agriculture. Approximately 90 percent of municipal water supply is groundwater, but the Playa itself is part of a closed basin and has no inter-basin groundwater inflow or outflow (ADWR 2009).

Surface Water

An intermittent stream flows through Sunnyside flowing south from the headwaters in the Miller Peak Wilderness of the Coronado National Forest. The stream eventually flows into Bodie Canyon one mile from the International Border with Mexico.

Intermittent streams exist in the Willcox Basin, with flow following winter rains and summer monsoons. Very few of these streams deliver water to the Willcox Playa as most of the water is lost to infiltration of streambeds, retention of water in cattle tanks or behind dams, or through evaporation. What water that does enter the Playa is muddy, silty water that mixes with water collected directly from rain storms (Schreiber 1978).

3.3.2 Environmental Consequences

Alternative One (Proposed Action)

The implementation of the Proposed Action would not result in significant impacts to water resources on-or off-post. The incorporation of lasers into testing and training activities conducted by the Fort would not result in any impacts to surface waters, ground waters or floodplains. Testing activities would be temporary in nature and are not expected to result in relocation of personnel to Fort Huachuca. The 2-13th is not proposing an increase in personnel to perform laser training, as the proposed laser use would be incorporated into their existing training mission. Therefore, proposed testing and training activities are not expected to increase the number of personnel stationed at Fort Huachuca or living within the region. Changes in potable water demand both on the Fort and within the region would be due to short-term lodging of testing or training-related personnel and would be negligible. All potable water necessary for testing activities on- and off-post are brought on to the sites and do not utilize ground or surface

waters. Potable water usage during laser testing and training activities would be limited and would mostly involve drinking water and hand washing stations brought on-site for personnel. The lasers themselves do not require water to operate.

The development of the new training site on the East Range could result in minor impacts to on-site surface water drainage. Construction activities converting undeveloped areas to impervious surfaces can create a higher level of on-site runoff and off-site erosion. Construction activities associated with the taxiway conversion and construction of the aircraft covering structure would be temporary in nature and the use of BMPs would reduce or eliminate these impacts. Long-term impacts associated with the additional impervious surfaces would be minor. Given the small size of the proposed development, these long-term impacts are anticipated to be less than significant. Additionally, this training area would not require any new water utilities on-site. All potable water would be brought on-site during training activities and stored in approved containers.

Alternative Two

Impacts associated with the Implementation of Alternative Two would be similar to those associated with the Proposed Action. No significant impacts are anticipated.

No Action Alternative

There would be no impacts to water resources on- or off-post under the No Action Alternative.

Cumulative Impacts

No long-term cumulative impacts to water resources are anticipated to occur as a result of any of the Alternatives. The potential exists for minor short-term and long-term impacts associated with the construction of the new runway and aircraft covering structure, which could combine with existing erosion issues on the East Range. Given the short duration of the added construction impact, and existing East Range revegetation efforts, it is unlikely that the impact would result in any cumulative impacts to local or regional water resources.

3.4 Biological Resources

3.4.1 Affected Environment

3.4.1.1 On-post

Vegetation

A total of 12 plant communities have been documented on Fort Huachuca that vary according to gradient, moisture regime, and elevation. These are shrubland, open grassland, mesquite-grass savanna, oak-grass savanna, pine woodlands, mesquite woodlands, oak woodlands, mixed woodlands, deciduous woodlands, mahogany woodlands, pinyon-juniper woodlands, and urban and built land (USAIC & FH 2006a). The dominant plant communities at Fort Huachuca are

mesquite-grass savanna (14,182 acres), shrub-grassland (12,295 acres), and oak woodland (11,509 acres). Portions of the Cantonment Area that are not considered urban or built-up land consist of shrub-grassland and shrubland.

The dominant vegetation types in the eastern portions of the South Range are open grassland and mesquite-grass savanna at elevations ranging from approximately 4,200 to 5,100 feet amsl. Woodlands dominate the upper elevations of the South Range between 5,200 and 7,200 feet amsl. Vegetation on the West Range is similar to that of the South Range, with open grassland occurring on the lower portions of the range in the north and east, transitioning through oak-grass savanna to oak and mixed woodlands in the south and west. The East Range consists primarily of shrublands of the Chihuahuan desert scrub type, ranging in elevation from 3,900 to 4,400 feet amsl.

The desert scrub community was historically desert grassland but was altered by livestock overgrazing prior to government ownership. Since 1960, when the Army fenced the East Range, the area has been improving, but bushy and non-native species have largely replaced the natural desert grassland. Lehmann lovegrass (*Eragrostis lehmanniana*), an introduced, invasive annual grass indicative of disturbance, is abundant within most mesquite grassland vegetation associations on the East Range (USAGFH 2010a).

Wildlife

A variety of fauna including mammals, reptiles, birds, fish, amphibians, and invertebrates are present at Fort Huachuca. Of the almost 500 species of birds found in southeast Arizona, approximately 313 species occur on Fort Huachuca (Taylor 1995, Ireland 1981).

Approximately 18 species of reptiles, 18 species of small terrestrial mammals, 5 species of large mammals, 18 species of bats, 6 species of amphibians, and more than 180 species of invertebrates have been documented on Fort Huachuca (Sam Houston State University 1996, Bailowitz and Upson 1997, USAGFH 2010a). Non-native fish are the only fish species that have been documented on Fort Huachuca since 1893 due to stocking and introductions for recreational fishing. These fish include rainbow trout (*Oncorhynchus mykiss*), bullhead (*Ameiurus spp.*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and redear sunfish (*L. microlophus*) (Sam Houston State University 1996).

Special Status Species

The federal Endangered Species Act (ESA) protects federally listed animal and plant species and their critical habitats. The U.S. Fish and Wildlife Service (USFWS) maintains a listing of species that are considered threatened, endangered, proposed, or candidates under the ESA. An endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species likely to become an endangered species in the foreseeable future. Candidate species are those that the USFWS

has enough information on file to propose listing as threatened or endangered, but listing has been precluded by other agency priorities. Although Fort Huachuca is not required by the ESA to consider candidate species, AR 200-1 requires the Army to consider candidate species in all actions that may affect them. The Bald and Golden Eagle Protection Act (BGEPA) provides federal protection to bald and golden eagles, including their parts, nests, or eggs.

Twenty-six federally listed or candidate species have the potential to occur in Cochise County, with ten federally protected species having been documented on Fort Huachuca (Table 3-1). A detailed listing of all the protected species with potential to occur within the Proposed Action Testing/Training Sites is included at Table 3-2.

Complying with federal environmental and natural resource laws and regulations is also consistent with the Army's commitment to be good environmental stewards but is a separate Command requirement. The 2010 Integrated Natural Resources Management Plan (INRMP) helps Fort Huachuca comply with federal and state laws including laws associated with environmental documentation, wetlands, special-status species and wildlife management by coordinating policy and program implementation (USAGFH 2010a). The species are described in detail in the 2010 Fort Huachuca INRMP (USAGFH 2010a).

Habitat for Protected Species

Critical habitat is a specific geographic area deemed essential for the conservation of a threatened or endangered species and may require specific management and protection. Critical habitat may include areas that are not currently occupied by the species but are needed for its recovery (USFWS 2002c). On-post, 368 acres of critical habitat is designated for Huachuca Water Umbel (HWU) along 3.8 miles of the Garden Canyon watershed.

Eleven Mexican spotted owl (MSO) Protected Activity Centers (PACs) on Fort Huachuca encompass approximately 6,729 acres of high quality MSO habitat that is currently occupied by owls, or that was occupied in the recent past. PACs will generally incorporate nest sites, several roost sites, and highly used foraging areas. The intention of the creation of these PACs was not to permanently set aside these lands, but to protect this habitat until it can be demonstrated that quality replaceable habitat can be created through active management (USFWS 1995).

Lesser long-nosed bats (LLNBs) feed solely upon the pollen and nectar of Palmer's agave late in the summer after saguaro and organ pipe cactus stop flowering. It is their only source of food in the United States in the late summer and early fall (Sidner 2006). Fort Huachuca created Agave Management Areas (AMAs) in the 1990s to protect the feeding habitat of the endangered LLNB. AMAs are located on the South and West Ranges where abundant Palmer's agave stands are found. Maintaining a sufficient number of self-sustaining natural populations of Palmer's agave is a primary goal of AMAs (USAGFH 2010a). AMAs totaling 6,209 acres are identified on-post.

Table 3-1. Special Status Species Within Cochise County

Common Name	Scientific Name	Status	Known to Occur On or Near Fort Huachuca
Sonoran Tiger Salamander	<i>Ambystoma mavortium stebbinsi</i>	Endangered	X
Chiricahua Leopard Frog	<i>Lithobates chiricahuensis</i>	Threatened	X
Arizona Treefrog	<i>Hyla wrightorum</i>	Candidate	X
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Candidate	X
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	X
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered	X
Sprague's Pipit	<i>Anthus spragueii</i>	Candidate	
Gila Topminnow	<i>Poeciliopsis occidentalis</i>	Endangered	
Yaqui Catfish	<i>Ictalurus pricei</i>	Threatened	
Gila Chub	<i>Gila intermedia</i>	Endangered	
Yaqui Chub	<i>Gila purpurea</i>	Endangered	
Loach Minnow	<i>Rhinichthys cobitis</i>	Endangered	
Desert Pupfish	<i>Cyprinodon macularius</i>	Endangered	
Beautiful Shiner	<i>Cyprinella formosa</i>	Threatened	
Spikedace	<i>Meda fulgida</i>	Endangered	
Cochise Pincushion Cactus	<i>Escobaria robbinsiorum</i>	Threatened	
Huachuca Water Umbel	<i>Lilaeopsis schaffneriana var. recurva</i>	Endangered	X
Canelo Hills Ladies'-tresses	<i>Spiranthes delitescens</i>	Endangered	
Jaguar	<i>Panthera onca</i>	Endangered	X
Ocelot	<i>Leopardus pardalis</i>	Endangered	X
Lesser Long-nosed Bat	<i>Leptonycteris yerbabuenae</i>	Endangered	X
New Mexican Ridge-nosed Rattlesnake	<i>Crotalus willardi obscurus</i>	Threatened	
Northern Mexican Gartersnake	<i>Thamnophis eques megalops</i>	Candidate	X
Sonoran Desert Tortoise	<i>Gopherus morafkai</i>	Candidate	
Huachuca Springsnail	<i>Pyrgulopsis thompsoni</i>	Candidate	X
San Bernardino Springsnail	<i>Pyrgulopsis bernardina</i>	Threatened	

Table 3-2. Special Status Species With the Potential to Occur within Proposed Action Testing/Training Sites

Species	Status	Species Description	Location	Threats to Population
Arizona Treefrog ¹ <i>Hyla wrightorum</i>	Federal Candidate Species	Small (1.8 inches) green frog with a dark eye stripe that extends past the shoulder sometimes down to the groin. Throat of the male is dusky green or tan. Tadpoles are golden-brown above and below and have mottled black tails (AGFD 2007).	OP, OFP² Known from less than 20 localities in the Huachuca Mountains, adjacent Canelo Hills, and wetlands at Rancho Los Fresnos in Sonora, Mexico (AGFD 2007). Approximately 30 percent of breeding habitat occurs on Fort Huachuca with the remaining 70 percent occurring on the Coronado National Forest (USFWS 2008a).	Habitat loss, mortality due to catastrophic fire, drought or floods, predation by introduced species, and habitat degradation caused by sedimentation and environmental contamination (USFWS 2007).
Canelo Hills Ladies' Tresses <i>Spiranthes delitescens</i>	Federally Endangered (62 FR 665)	Herbaceous perennial and slender erect terrestrial orchids with 5-10 grass-like leaves. Flowering occurs in late July to August.	OFP² Species is known from five sites at about 5,000 feet in the San Pedro River watershed (Newman 1991, USAIC & FH 2006a). Grows on slopes near water where finely grained, highly organic soil is seasonally or perennially saturated but well drained.	Threats include groundwater pumping, water diversions, sand and gravel mining, recreational impacts, illegal collection, and invasion by non-native plant species (USFWS 2007).
Chiricahua Leopard Frog <i>Lithobates chiricahuensis</i>	Federally Threatened (67 FR 40789) AZ Species of Concern	Has small cream colored spot or tubercles on a dark pattern on rear of the thigh. Stocky looking, with rough skin on back and sides and overall green coloration on head and back. Length of 2.1 to 4.7 inches (USFWS 2008b).	OP, OFP² Two disjunct populations of this species exist in Arizona, one occurs in central and east-central Arizona along the Mogollon Rim, and the second occurs in southeastern Arizona and was at one time known as the Ramsey Canyon leopard frog (USFWS 2008b). Species not seen on Fort Huachuca since Tinker Pond dried out in the early 2000s (Stone 2008).	Predation by invasive frogs, loss of genetic variation and demographic stochasticity, as well as habitat destruction and degradation (AGFD 2001a,b).

Species	Status	Species Description	Location	Threats to Population
Cochise Pincushion Cactus <i>Coryphantha robbinsorum</i>	Federally Threatened (51 FR 952)	Small, unbranched cactus with no central spines and 11-17 radial spines. Bell shaped flowers are pale yellow-green; fruits are orange-red when ripe but quickly turn dull red (USFWS 2002b).	OFP² Occurs in the southeastern corner of Cochise County and in adjacent Sonora, Mexico (SFB 1996). Inhabits the cracks of limestone rocks found on hilltops in semi-desert grasslands.	Threats include soil disturbing activities that include vehicular movement, recreational activities, and livestock movement, as well as the introduction of non-native species (USFWS 2002b).
Huachuca Springsnail <i>Pyrgulopsis thompsoni</i>	Federal Candidate Species Protected by the State of Arizona (AGFD 1993)	Small 0.05 to 0.15 inch long mollusk with a conical-shaped shell that has three to five convex whorls. Occupies shallow areas of springs and cienegas that are typically marshy.	OP, OFP² Known to occur in up to 16 sites within the upper San Pedro River drainage and the upper Santa Cruz River drainage (USFWS 2010).	Loss or degradation of habitat due to overgrazing, timber harvest, altered fire regimes, drought, mining, groundwater withdrawal, recreation, and catastrophic fire (USFWS 2010).
Huachuca Water Umbel <i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>	Federally Endangered (62 FR 3)	Herbaceous semi-aquatic perennial with slender erect leaves that grow from the nodes of creeping rhizomes. The leaves are segmented and are hollow cylinders that are from 1-9 inches in length depending upon water depth (USFWS 2001b).	OP, OFP² Found in southeastern Arizona in cienegas and associated vegetation within Sonoran desert scrub, grassland, or oak woodland as well as in conifer forest between 4,000-6,500 feet (USFWS 2001b). Known to occur in up to 16 sites within the upper San Pedro River drainage and the upper Santa Cruz River drainage (USFWS 2010). Nine populations of this species are located within the higher elevations in Garden, Sawmill, McClure, Huachuca, and Blacktail Canyons (USFWS 1997b, AGFD 1993).	Primary threats include alteration of ground and surface flows, (USFWS 1997a), increased soil erosion, reduced water infiltration (Rinne & Neary 1996), and stability of perennial water systems.

Species	Status	Species Description	Location	Threats to Population
Lemmon Fleabane <i>Erigeron lemmonii</i>	Federal Candidate Species	Small, flowering, prostrate perennial with stem that spread 4 to 8 inches in length. It has daisy-like flowers that are white or light-purple with yellow inner petals (Warren et al. 1991a).	OP² Found growing in dense clumps only on vertical cliffs located at elevations between 6,300 and 6,600 feet in Scheelite Canyon in the Huachuca Mountains (Warren et al 1991a, Tandy 1997).	Vulnerable to impacts of a single catastrophic even or combination of localized events such as drought or wildfire (USFWS 2008a).
Lesser Long-Nosed Bat <i>Leptonycteris yerbabuenae</i>	Federally Endangered (53 FR 38456) AZ Species of Concern	Medium sized bat with yellowish-brown or pale gray above and cinnamon-brown below. Has an elongated nose with a small nose-leaf at the tip. This species is approximately 2.7 to 3.7 inches long (USFWS 2001a).	OP, OFP² Historically extends from central Arizona and southwest New Mexico through Mexico to El Salvador. This species consumes the nectar and pollen of agave flowers and the nectar, pollen, and fruit produced by columnar cacti. This species has consistently been found at Fort Huachuca from late June through October and as late as the end of November (Sidner 2000).	Disturbance and loss of roost and foraging habitat and the taking of individual bats during animal control programs.
Mexican Spotted Owl <i>Strix occidentalis lucida</i>	Federally Threatened	Ashy-chestnut brown color with white and brown spots on its abdomen, back, and head. Has dark colored eyes.	OP, OFP² 4 million acres of critical habitat spread across the state of Arizona in 25 different units. Found in steep canyons containing cliffs with stands of live oak, Mexican pine, and broad-leaved riparian vegetation as well as mixed conifer and pine-oak forests (Ganey & Balda 1989). Documented as occurring in 11 Protected Activity Centers (PACs) at Fort Huachuca. Critical habitat is designated to the south of Fort Huachuca in the Coronado National Forest.	Threats include actions that create forest openings that remove mature or old-growth forests and human activities in or near nesting, roosting, or foraging sites.

Species	Status	Species Description	Location	Threats to Population
Northern Mexican Gartersnake <i>Thamnophis eques megalops</i>	Federal Candidate Species AZ Species of Concern	Stout-bodied snake that reaches a total length of 18-40 inches with females larger than males. Brown or greenish-brown with a yellow-white stripe running down the back. Secondary stripes run down the third and fourth scale rows on each side of the body (AGFD 2001c).	OPF ² Ranges from southeastern Arizona and extreme southwestern New Mexico into Mexico. Most abundantly found in densely vegetated habitat surrounding cienegas, cienega-streams, and stock tanks, or along streams in valley floors and generally open areas (AGFD 2001c).	Threatened by the expanding range of introduced non-native species that prey upon and compete with this snake and its prey base. Habitat loss from improper livestock grazing, development, water diversions, groundwater pumping, and climate change is also a significant threat.
Sonora Tiger Salamander <i>Ambystoma mavortium stebbinsi</i>	Federally Endangered (50 FR 665) AZ Species of Special Concern	Black, with yellow spots and stripes, may grow up to 13-inches long. Dependent upon water sources for breeding and larval stages, but capable of developing into branchiate (stay in water entire life) or metamorphosed (terrestrial) adults (USFWS 2002a).	OP, OPF ² Found in 53 Ponds in San Rafael Valley of Arizona (USFWS 2002a). Historically inhabits springs, cienegas, streams, or backwaters that contained permanent or nearly permanent water sources. Locally found in Scotia and Copper Canyons, as well as Upper Garden Canyon Pond and the junction of Sawmill at Garden canyons on Fort Huachuca.	Predation by nonnative fish and bullfrogs, disease catastrophic floods, and habitat degradation caused by loss of cover and erosion (USFWS 2002a).
Yellow-Billed Cuckoo <i>Coccyzus americanus</i>	Federal Candidate Species AZ Species of Special Concern	Adults have long tail, with brown on dorsal surfaces and black and white below. They have a black curved bill with yellow especially on the lower portion as well as a yellow ring around the eye.	OP, OPF ² Known to occur in Arizona across southern and central Arizona and the extreme northeast. Nests in riparian forests and scrub as well as mesquite bosques. Only known occurrence at Fort Huachuca occurred in 2001 in Middle Garden Canyon Pool (USAIC & FH 2006a).	Loss, degradation and fragmentation of mature cottonwood-willow riparian habitat, stream diversion, agriculture, urbanization, overgrazing, and invasion of non-native invasive species.

¹Huachuca/Canelo Population; ²**OP**-On-post, **OPF**-Off-post

On 20 August 2012, the USFWS proposed the designation of Critical Habitat for the jaguar (*Panthera onca*) (50 CFR 17). The proposed critical habitat covers 838,232 acres in Arizona and New Mexico and would include land covering the western and southern portions of Fort Huachuca in the Huachuca Mountains. This designation was put out for public review with comments required to be received or postmarked by October 19, 2012. Included in this review, the USFWS takes into special consideration Fort Huachuca's INRMP. Should Fort Huachuca's INRMP be amended to include the jaguar before the final critical habitat rule is completed, or should USFWS receive information demonstrating the INRMP provides benefits to the jaguar through measures designed for other species (for example, the Mexican spotted owl), USFWS would consider exempting lands owned and managed by the Fort. At the time of the writing of this document, a final ruling was not published.

Wetlands and Aquatic Habitat

The U.S. Congress enacted the Clean Water Act (CWA) in 1972 to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (33 U.S.C. 1251 et seq.). Section 404 of the Clean Water Act delegates jurisdictional authority over wetlands to the Corps of Engineers and the Environmental Protection Agency (EPA).

Fort Huachuca contains 64 acres of wetlands and 770 acres of riparian habitat that are protected by the CWA (USACE 2008). Most of the wetlands on Fort Huachuca are palustrine unconsolidated bottom wetlands (65 percent) or palustrine emergent wetlands (13 acres). The predominant riparian type is emergent alkali sacaton (188 acres). Garden, Huachuca, and McClure Canyons support most of the riparian habitat at Fort Huachuca.

3.4.1.2 Off-post

Vegetation

The Coronado National Forest utilizes a Forest Plan to direct the management of their forest over a 10-15 year time scale. The plan provides for integrated multiple use and sustained yield of goods and services in a way that will maximize the long term net public benefits in an environmentally sound manner (USDA Forest Service 2005). All permits that are issued for use on the forest must comply with the Forest Plan for each National Forest (36 CFR 219.10 (e)). Each National Forest throughout the nation creates one of these plans to ensure the long term management of the Forest in the best interest of the public.

The Sunnyside Test Site, located in the National Forest, is composed of three documented plant biomes: scrub-grassland (semidesert), Madrean evergreen forest and woodland (oak-pine), and Madrean evergreen forest woodland (encinal). These biomes cover elevations from 3,510 feet to 7,513 feet and are dominated by bunch grasses such as sideoats grama (*Bouteloua curtipendula*) and squirreltail (*Elymus elymoides*), shrubs such as fragrant sumac (*Rhus aromatic*), Palmer's agave (*Agave palmeri*), and Toumey oak (*Quercus toumeyii*), and trees

such as Arizona white oak (*Quercus arizonica*), Chihuahuan pine (*Pinus leiophylla*), and Apache pine (*Pinus engelmannii*) (Bennett et al 2004).

Willcox Playa is sparsely-vegetated desert grassland that is dominated by alkali sacaton (*Sporobolus airoides*) and saltgrass (*Distichlis spicata*), with some cover by other grasses. At the edges of the Playa, shrub species are seen, dominated by tamarisk (*Tamarix* sp.), saltbushes, and mesquites, with Fremont's cottonwood (*Populus fremontii*) and Goodding's willow (*Salix gooddingii*) frequenting the ditches that historically have drained the Playa (NAU 2011).

Wildlife

Sunnyside lies on the south side of the Huachuca Mountains and is part of an area known for world class bird watching, with over 170 species of birds observed. Over 60 species of reptiles and 78 species of mammals including many species normally seen south of the Mexican border are found here as well (AZT 2012).

Willcox Playa is the winter home to hundreds of species of migrating birds, including numerous species of waterfowl such as white-faced ibis (*Plegadis chihi*), raptors such as prairie falcons (*Falco mexicanus*) and caracaras (*Caracara* sp.), and has become the best spot in the state to see sandhill crane (*Grus canadensis*). A wide variety of mammals including javelina (*Pecari tajacu*), desert cottontails (*Sylvilagus audubonii*), and mule deer (*Odocoileus hemionus*), and several distinctive species of amphibians and reptile species have been identified as using the numerous habitats identified at the Playa (NAU 2011).

Special Status Species

Of the large number of species that exist in Arizona, 39 animals and 17 plants are listed as threatened or endangered according to the ESA and there are 24 candidate species for protection under the ESA. Of these, four species fall within the range of where existing test sites occur. Special status species are listed in Table 3-1.

The four special status species are known to occur in the area of the Sunnyside Test Site as shown in Table 3-1 to include the Sonora tiger salamander, LLNB, Mexican spotted owl, and Northern Mexican Gartersnake.

No special status species are known to occur in the Willcox Playa.

Wetlands and Aquatic Habitat

There are no known wetlands or aquatic habitat within the Sunnyside Test Site, while the Willcox Playa is an ancient enclosed lake bed that seasonally floods to a shallow depth.

3.4.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to result in any significant direct or indirect impacts to biological resources. The Proposed Action does not include the introduction of any new vehicles, equipment, or weaponry that isn't already in use by the Fort both on- and off-post. Impacts to biological resources associated with the various laser platforms proposed for use (UAS, ground vehicles, weaponry, etc.) would continue to be managed using existing applicable regulations and environmental documentation, including but not limited to the Fort's INRMP, previous Environmental Assessments, Species Management Plans, etc.

The lasers proposed for use by the Fort are typically used for sighting, targeting, and ranging and are considered low-powered (when compared with directed energy lasers that have an amplified pulse that may be used as a weapon or countermeasure). The primary concern for wildlife species with these lasers is vision damage. Current literature focuses on responses of birds to lasers due to the interest in the use of lasers to reduce bird-aircraft strikes at airports. Lasers that are directly pointed at flocking birds are widely used as deterrents for various species of birds, including seagulls, vultures, and American crows, and resulting in a short term impact to the level of presence of bird species in the area (Blackwell et al 2002.) These studies used a consistent laser beam during low-level light conditions that required multiple nights of application to create an abandonment of roosts, while short term application of lasers showed a varied response that is dependent upon context and species, but generally showed avoidance of the laser beam (Blackwell et al 2002, Gorenzel et al, 2002). While fewer studies for other species groups are available, the response is expected to be similar.

Research shows that bird eyes are coated with a film, or oils depending upon species, that protects them from ultraviolet rays of the sun and additionally has shown resistance to damage from low-powered laser beams (Glahn, et al. 2000). Limited literature on laser impacts to the vision of mammals is available, so it should be expected that risks to the eyes of mammals would be similar to the risk to human eyes. See *Section 3.14, Health and Human Safety* for more detailed information on the risks related to human eyes. The risk of burns to wildlife should also be anticipated to be similar to the risks of burns to human skin. Since wildlife would not be cognizant of the dangers associated with lasers and the safety precautions necessary to protect themselves, they may have a slightly greater risk of incidental exposure to the lasers than humans. However, lasers used in the Proposed Action would not target any wildlife. Prior to any laser testing or training activities, the target, target area, and associated buffer would be surveyed for unsafe conditions. Additionally, if during testing or training activities, any unsafe or marginally unsafe condition is identified, all lasing would cease immediately until the deficiency is corrected (USAGFH 2012a). Although the pre-operational survey does not specifically include a thorough inspection of wildlife in the testing and training areas, should an animal or bird enter the path of the laser beam during operations, or if the laser beam misfires or misses the target, which could pose a risk to nearby wildlife, these scenarios would be considered unsafe and

operations would immediately cease. Additionally, if the ENRD has concerns about a specific plant or animal species that may be affected in a designated testing or training area, those concerns should be brought to the attention of Range Control during the site-specific review process, and applicable safety and/or avoidance measures should be implemented.

Impacts to plants from lasers would be limited to burns and fire hazards. Lasers that could potentially cause burns to human or animal skin, would also pose a burn risk to plants. There is greater risk for burns to occur during very dry conditions, when plants are already experiencing stress from lack of water. However, vegetation would not be targeted by lasers, and more than a momentary flash of the laser on dry vegetation would be required to provide the energy needed to start a fire. The Fort's compliance with applicable safety regulations and guidelines, and established procedures for handling unanticipated unsafe conditions as specified in the Laser SOP, reduces the risk of incidental exposure of the laser beams to the vegetation. Fires could be started from a combination of dry conditions and high energy lasers. Risk assessments are required to be completed prior to the start of any laser testing or training activities (USAGFH 2012a). Fire hazards associated with each proposed testing or training activity would be known and personnel would be knowledgeable of what to do in the event of an accidental fire. If the fire cannot be extinguished using on-site, approved fire extinguishers or other fire-fighting equipment, then the appropriate emergency services would be contacted and dispatched to the site.

Impacts to sensitive species known to occur on Fort Huachuca are not anticipated. No suitable nesting habitat exists on Fort Huachuca, Sunnyside, or Willcox Playa for the Bald Eagle, the Southwestern Willow Flycatcher, or the Yellow-Billed Cuckoo, therefore the Proposed Action is not likely to impact these species. Chiricahua leopard frogs have not been identified in the Proposed Areas even though potential habitat exists. No impacts to Mexican spotted owls or Lesser Long Nosed bats are anticipated as management plans implemented by the Fort identify measures that individuals involved with training must undertake to limit impacts to these species (ENRD 2007, ENRD 2006.) Additionally, there are no negative impacts anticipated for the prey base of jaguars or ocelots, as there will be no loss of their habitat or loss of potential prey.

Conversion of the dirt taxiway to a paved asphalt runway will cause some habitat modification through soil compaction, tunnels and burrows being collapsed, or loss of vegetation for food or shelter may occur from vehicles working in and around the runway. Disturbance caused by the presence of humans and vehicles may lead to an increase of excitement or stress, a changing of normal essential activities (animals becoming more vigilant due to human presence as opposed to feeding or sleeping,) severe exertion, or displacement (Hammit and Cole 1987.) Wildlife may flush from an area leaving young exposed or leave territories vulnerable to competitors or predators. This is similar to the responses from recreation activities (Huckelberry 2001).

Alternative Two

Biological Resource impacts under Alternative Two are anticipated to be similar but less than those associated with the Proposed Action, as this Alternative includes fewer training areas. No significant impact is expected to biological resources with this Alternative.

No Action Alternative

The No Action Alternative would have no impact to Biological Resources.

Cumulative Impacts

Threats to regional biological resources resulting from the conversion of rangelands to residential and commercial uses and the resulting incompatibilities between man and nature are expected to continue in and around Fort Huachuca. Several federal and state agencies in addition to numerous non-governmental organizations are active in the protection and conservation of special status and wildlife species in the area. Fort Huachuca is committed to the stewardship of biological resources on-post and off-post and is actively engaged in regional partnerships to mitigate potential impacts resulting from its ongoing mission. Due to the temporary and limited duration of individual EPG laser testing events and the 2-13th's training activities, and the limited potential for these actions to negatively influence biological resources, no cumulative impacts to biological resources are anticipated to result from implementation of any of the Alternatives.

3.6 Cultural Resources

3.6.1 Affected Environment

3.6.1.1 On-post

Cultural resources is a broad term that includes all aspects of human activities, including material remains of the past and the beliefs, traditions, rituals and cultures of the present. As mandated by law, all federal installations and personnel must participate in the preservation and stewardship needs of archaeological and cultural resources and must consider potential impacts to these resources prior to any installation undertaking. Resources include historic properties as defined by the National Historic Preservation Act (NHPA), cultural items as defined by the Native American Graves Protection and Repatriation Act (NAGPRA), archaeological resources as defined by the Archaeological Resources Protection Act (ARPA), sacred sites as defined by Executive Order (EO) 13007, to which access is provided under the American Indian Religious Freedom Act (AIRFA), significant paleontological items as described by 16 U.S. Code (USC) 431-433 (Antiquities Act of 1906) and collections as defined in 36 CFR 79, Curation of Federally Owned and Adminstrated Archaeological Collections (DA 2007).

As of January 2011, 60,900 acres of Fort Huachuca had been surveyed by Fort archaeologists or other designated representatives, accounting for roughly 83 percent of the Installation. Two

archaeological sites, the Garden Canyon Site and the Garden Canyon Pictographs Site, are listed in the National Register of Historic Places (NRHP). Five sacred sites have been identified on Fort Huachuca by federally recognized Indian tribes, including: the Garden Canyon Site, the Garden Canyon Pictographs Site, the Rappel Cliffs Rockshelter Site, the Apache Flats and the Apache Scout Camp (USAGFH 2008). The “Old Post” of Fort Huachuca is listed in the NRHP and as a National Historic Landmark (NHL) District. The “Old Post” area includes 57 acres and contains 86 buildings, two sites and two structures, but only 65 buildings and 2 sites are contributors to the District. There are 101 buildings and structures located outside of the NHL that are considered historic.

The known cultural sites, which include all historic buildings and structures, and prehistoric and archaeological sites, are located throughout the Installation on all three ranges and within the Cantonment Area. The majority (397) of the cultural sites are located on the East Range, 58 are located on the South Range, 90 on the West Range, and 18 in the Cantonment Area.

The NHPA of 1966 and AR 200-1 constrain land uses and development where cultural resources are affected. The Fort Huachuca Integrated Cultural Resources Management Plan (ICRMP) (USAGFH 2008) guides the Installation’s cultural resources management program. Specific guidance and procedures for managing and maintaining historic buildings is provided in TM 5-801-1, Historic Preservation Administrative Procedures, and TM 5-801-2, Historic Preservation Maintenance Procedures.

3.6.1.2 Off-post

Off-post, the Arizona State Historic Preservation Office (SHPO), a division of Arizona State Parks, assists private citizens, private institutions, local governments, tribes, and state and federal agencies in the identification, evaluation, protection, and enhancement of historic and archaeological properties that have significance for local communities, the State of Arizona, or the Nation. The role and function of the SHPO is defined in both state law (Arizona Historic Preservation Act) and federal law (NHPA, as amended). Activities of the SHPO include:

- Statewide survey to identify and evaluate historic structures and archaeological sites;
- Nomination of eligible historic and archaeological properties to the National Register of Historic Places;
- Review of federal and state actions that may affect historic and archaeological properties;
- Technical assistance to owners of historic properties;
- Technical assistance to Certified Local Governments/local preservation commissions;
- Public education and awareness programs; and
- Assistance through matching grants; and assistance to property owners seeking tax credits and incentives.

The thousands of historic houses, buildings, structures, and archaeological sites in Arizona represent a tangible link to Arizona's past. The SHPO conducts an ongoing historic/prehistoric resource survey program to identify, evaluate, and plan for the effective and responsible management of these significant properties. The SHPO has also developed a comprehensive State Plan for historic and prehistoric resources in Arizona. State and federal agencies, cities and towns, nonprofit organizations, and individuals participate in and contribute to this survey and planning effort.

There are no known historic properties or archaeological sites located at the Sunnyside site or Willcox Playa site.

3.6.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to result in any direct or indirect impact to cultural resources. Utilizing boundaries that were identified by previous cultural survey efforts and the Fort's digital GIS database, the proximity of testing and training sites to known cultural resources has been calculated. A majority of the EPG's test sites, (more than 1,200), are located within previously surveyed areas of Fort Huachuca. No protected resources are known to occur within the operational areas of these test sites. Any resources detected by previous surveys have been marked and are subsequently avoided during the EPG's testing activities according to standard operating procedures (SOPs) outlined in the Fort Huachuca ICRMP (USAGFH 2008).

The remaining 400 on-post test sites are located within areas that may not have been surveyed for cultural resources. Based on the parameters of future testing requirements and a possibility for additional protected resources to be discovered on Fort Huachuca, new surveys may be required at these existing on-post test sites. The need for a new survey would be identified during the pre-coordination review that occurs between the EPG Environmental Coordinator and ENRD prior to the test beginning. However, due to the limited ground disturbance associated with most EPG testing activities, significant impacts to cultural resources are not anticipated.

The 2-13th's laser training activities would also avoid all known protected resources. Their proposed laser use would be incorporated into existing UAS training activities and would not target any areas containing known cultural resources.

There are no historic buildings or structures, or known archaeological resources, located on the proposed runway site on the East Range. Due to the disturbed nature of the site, it is unlikely that the Proposed Action would impact any unidentified archaeological resources.

There are no known historic properties or structures, or archaeological sites located on the Willcox Playa or Sunnyside training areas. Surveys at these off-post sites may be required in the future based on parameters of tests and the age of any existing previous survey. Due to the limited ground disturbance and potential for subsurface disturbance associated with the EPG

laser testing activities, the Proposed Action would not be anticipated to significantly impact unidentified archaeological resources at either off-post test site.

As stated in the Fort Huachuca ICRMP SOP 4 (USAGFH 2008), should previously undiscovered archaeological materials be encountered during any testing or training, activities would cease, the Fort Huachuca ENRD would be contacted, and the site would be protected until an evaluation by ENRD had been completed as to the extent of protection, avoidance or other restriction to the use of the site. This process would also apply to the off-post sites.

Alternative Two

Impacts associated with Alternative Two are similar to Alternative One, but pose a potentially smaller risk of incidental impacts to cultural resources since the number of testing areas would be reduced. No significant impacts are anticipated.

No Action Alternative

The No Action Alternative would not result in any impacts to cultural resources.

Cumulative Impacts

The Sierra Vista and San Pedro River Basin have a rich and diverse cultural history. A large number of cultural sites have been identified, many of which are located on Fort Huachuca. Many of these sites and properties are currently being preserved as well as registered through national programs. Within Fort Huachuca, the ICRMP, as well as the State SHPO dictate the treatment and preservation of all cultural resources. Off-post sites are evaluated for potential cultural resources prior to lease and requests for permission to use the property (USAGFH 2010). Cumulative impacts associated with cultural resources are not anticipated.

3.7 Air Quality

3.7.1 Affected Environment

3.7.1.1 On-post

Fort Huachuca is located in the Southeast Arizona Air Quality Control Region, which includes Cochise, Graham, Greenlee, and Santa Cruz Counties. The region benefits from favorable wind patterns and a lack of major pollutant sources (e.g., heavy industry and fossil fuel power plants) (JITC 2004). A region is either in “attainment” or “nonattainment” of the National Ambient Air Quality Standards (NAAQS) established under the Clean Air Act (CAA). Depending on the pollutant and averaging time, nonattainment status is classified as Extreme, Severe, Serious, Moderate, Marginal, and Submarginal (listed most significant to least significant).

Fort Huachuca and the immediate vicinity lies within an attainment area for all NAAQS and is not subject to a General Conformity Analysis, which only applies to Federal actions on property that lies within a nonattainment area.

In the past, Fort Huachuca's annual emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) have exceeded established Major Source emissions thresholds of 100 tons per year (tpy) set by the Arizona Department of Environmental Quality (ADEQ) and the U.S. EPA. Although Fort Huachuca has many emission sources, the Fort's current annual emissions fall far below the 100 tpy threshold that would classify it as a Title V Major Source, which is the most highly regulated permit. Staying under the Major Source threshold qualifies Fort Huachuca for a Class II synthetic minor air permit, which was issued in 2012 and must be renewed every 5 years. A synthetic minor permit, as defined by Arizona Administrative Code Title 18, Chapter 2, Section 306.01 (R18-2-306.01), includes voluntarily accepted emissions limitations, controls, or other requirements (for example, a cap on production rates or hours of operation, or limits on the type of fuel) meant to reduce the potential to emit to a level below the major source threshold.

The conditions included in Fort Huachuca's permit include removal of a portion of the volatile organic compound (VOC) emissions from Fort Huachuca's inventory, which was easily achieved because the Army and Air Force Exchange Service gas stations are operated as a separate entity not under direct control of the Army. Another key condition for synthetic minor status requires limiting the amount of fuel burned by heaters, furnaces, and boilers in order to ensure NO_x emissions would remain below the major source threshold. Fort Huachuca has agreed to lower its annual NO_x emissions by limiting the use of backup generators from an annual maximum of 500 hours to 100 hours.

As part of Fort Huachuca's regulatory reporting requirements, a comprehensive air pollution emissions statement, known as an Air Emissions Inventory (AEI), must be prepared annually. The AEI evaluates sources which emit any single regulated air pollutant in a quantity greater than 1 tpy or the amount listed in R18-2-101, whichever is less, as well as sources that emit any combination of regulated air pollutants in a quantity greater than 2.5 tpy (R18-2-327). The AEI quantifies emissions from seven criteria pollutants, including total suspended particulate, NO_x, particulate matter, fine (PM₁₀), VOCs, sulfur dioxide (SO₂), lead (Pb), and CO. Additionally, the AEI includes annual emissions of hazardous air pollutants (HAPs) and ozone depleting substances (ODS).

Sources that emit criteria pollutants, HAPs, or ODS at Fort Huachuca include:

- Gas fired boilers, heaters, and hot water heaters,
- Generators,
- Fuel storage and dispensing operations,
- Paint spray booth operations,
- Abrasive blasting operations,
- Firing range operations,
- Chillers, air conditioners, and refrigeration units,

- Welding operations,
- Wastewater treatment operations,
- Pesticide, herbicide, rodenticide, and insecticide usage,
- Degreasing operations,
- Miscellaneous chemical usage, and
- Other sources (Versar 2010).

Greenhouse Gases

Although the subject of global warming due to man-made production and release of greenhouse gases (GHGs) is still under debate, the EPA made an endangerment finding stating that “current and projected concentrations of the six key well-mixed greenhouse gases (CO₂, CH₄, N₂O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations” (EPA 2011). This finding has opened the door for the regulation of GHG emissions published in 75 FR 31514, which led to what is known as the prevention of significant deterioration (PSD) & Title V GHG Tailoring rule (FR 2010). For the purposes of PSD and Title V, this rule has set a major source threshold of 100,000 tpy carbon dioxide equivalent (CO₂e) and a 75,000 tpy CO₂e significance level (FR 2010).

In addition, on September 22, 2009, the Administrator of the EPA signed the Final Mandatory Reporting of GHG Rule, known as the Mandatory Reporting Rule (MRR). The final rule was published in the Federal Register (40 CFR Part 98) on 30 October 2009. The final rule requires reporting of GHG emissions from large sources, which are those sources that emit 25,000 metric tons (MT) CO₂e or more per year. With the exception of electric generating and cogeneration plants, all stationary facilities that emit more than 25,000 MT of CO₂e per year are considered covered and must report.

As of the writing of this PEA, Fort Huachuca has not prepared a GHG inventory, but the work has been contracted and is currently being conducted. While Fort Huachuca definitely emits GHGs, based on the data in the most recent AEI associated with its’ synthetic minor permit, it is unlikely that it will meet the requirements outlined in the Tailoring Rule, which relate to permitting or the 25,000 tpy threshold established by the MRR, which relate to reporting only. Subpart C of the MRR addresses stationary fuel combustion sources including boilers, heating units, and water heaters, but does not specifically mention any of the other emission sources cited previously. Therefore, it is assumed that the Fort’s heating units will produce the vast majority of GHG emissions emanating from the Installation. Based on the amount of natural gas Fort Huachuca uses to fire its heating units, approximately 13,400 tpy of CO₂e will be emitted. While this doesn’t include all the GHG emissions generated by Fort Huachuca, the combination of all other sources is insignificant in comparison.

3.7.1.2 Off-post

The off-post test sites that will be used fall within the Southeast Arizona Air Quality Control Region as Fort Huachuca does, and therefore because they lie within an attainment area, these sites are not subject to a general conformity analysis.

3.7.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to result in any significant direct or indirect impacts to air quality. Potential long-term impacts to air quality resulting from the Proposed Action are associated with the burning of fossil fuels in vehicles, equipment, and generators serving as laser platforms, and the generation of dust through use of dirt roads to access some of the testing and training sites. While the use of these vehicles and equipment results in the emission of criteria air pollutants, the Proposed Action would not result in a significant increase in the number of vehicles and equipment being used by the Fort. Additionally, the lasers do not emit any criteria air pollutants.

Short-term impacts to air quality may result during the construction of the runway and aircraft covering structure. These impacts would result from the vehicle and equipment emissions, and dust generated during construction activities on-site. The current air operating permit requires dust control measures be implemented to control dust generated during any operation or excavation activities. Control methods are specified in the air permit with associated monitoring and recordkeeping requirements to demonstrate compliance with the conditions of the air permit. Based on the small-scale of the project and the temporary nature of these activities, impacts are anticipated to be less than significant.

Cochise County is in federal attainment for all criteria air pollutants. Portable generators used in conjunction with the EPG testing activities and 2-13th training activities are considered minor sources under State of Arizona regulations, and the emissions generated are considered trivial in nature. The Proposed Action is not anticipated to increase the number of portable generators in-use by the EPG or 2-13th. However, should the addition of new portable or stationary generators become necessary, the proponent of the project would be required to coordinate with the ENRD to ensure that the generator is accounted for in the Fort's permit and that necessary modifications to the permit are made prior to the start of the activity. Effects of the additional portable generator would be addressed during project-specific review. The new aircraft covering structure would be solar-powered and contain self-composting restroom facilities, and would not require the use of a generator.

The limited use of fossil fuel vehicles and equipment is not anticipated to impact regional or local air quality conditions. Air emissions are not expected to exceed de minimis threshold levels or contribute emissions in violation of any federal, state, or local air quality regulations.

Alternative Two

Air quality impacts under Alternative Two are anticipated to be similar but may be less than those associated with the Proposed Action due to the reduction in available testing areas. Air quality impacts are anticipated to be less than significant.

No Action Alternative

The No Action Alternative would not result in any impacts to local or regional air quality.

Cumulative Impacts

Air quality in the Sierra Vista area has consistently been within attainment of the NAAQS. In the past, ADEQ's annual evaluations at Fort Huachuca have shown emissions to be relatively low. The Fort has chosen to be a Title V Class II Synthetic Minor by placing caps on emissions by limiting our operational loads and run times for permitted equipment. The Fort's current operating permit articulates "permitted emission limit" for each type of permitted equipment or activity air source and aggregate insignificant air sources. The Fort's permit dictates that they prepare an air emissions inventory (AEI) to report actual emissions. This is one report that is used to show compliance with the operating permit. The Fort prepares and submits the annual report to demonstrate compliance.

Future air quality will likely be influenced by the development of areas surrounding Sierra Vista and Fort Huachuca. Urban development has tended to expand in areas surrounding Sierra Vista, which inherently brings about various types of air pollution sources.

Continued air quality monitoring, voluntary reduction of emissions, annual preparation of an AEI, and continued Greenhouse Gas monitoring aim to keep air quality at the Fort within attainment of the NAAQS. Given these air quality monitoring mechanisms, and the short duration of vehicle and generator usage at testing and training sites, it is unlikely that the implementation of any of the Alternatives would result in cumulative impacts to air quality.

3.8 Noise

3.8.1 Affected Environment

3.8.1.1 On-post

Noise, by definition, is sound that is loud or unpleasant or that causes a disturbance. When sound interrupts daily activities such as sleeping or conversation, it becomes noise. The degree to which noise will become disruptive is dependent on the way that it is perceived by the receptors (people) living or working in the affected area. Noise is measured in decibels (dB) with zero being the least perceptible sound to more than 130 dB at which noise becomes a health hazard. Because the human ear is more sensitive to certain ranges of the sound spectrum, a weighted scale has been developed to more accurately reflect what the human ear perceives.

These measurements are adjusted into units known as A-weighted decibels (dBA) (USAGFH 2000).

According to AR 200-1 (DA 2007), sensitivity to noise varies by the time of day, with receptors being more sensitive at night. To reflect this sensitivity, ambient noise measurements are normally adjusted by adding 10 dB to actual measurements between the hours of 2200 and 0700. Decibel levels adjusted in this way are known as day-night decibel measurements (DNL). Averaging noise levels over a protracted time period does not generally adequately assess the probability of noise complaints coming from receptors in the nearby community. Therefore, the risk of noise complaints from large caliber impulsive noise resulting from testing and training activities (e.g., machine gun, mortars and demolition events), in terms of either peak sound pressure level (PK 15 (met)) or C-weighted day night level (CDNL) must also be assessed (DA 2007).

Table 3-2, summarizes decibel levels associated with four different noise zones (Land Use Planning Zone (LUPZ), Zone I, Zone II, and Zone III). Each zone is defined according to allowable noise limits, which increase in intensity from LUPZ to Zone III. Typically, land uses, such as housing, schools, and medical facilities are located within the LUPZ and noise Zone I, but construction of these uses is strongly discouraged in Zones II and III (DA 2007).

Table 3-3. Noise Limits for Noise Zones

Noise Limits (dB)			
Noise Zone	Aviation ADNL	Impulsive CDNL	Small Arms PK 15 (met)
LUPZ	60 – 65	57 – 62	N/A
Zone I	< 65	< 62	< 87
Zone II	65 – 75	62 – 70	87 – 104
Zone III	> 75	> 70	> 104

dB- decibel; **LUPZ-** land use planning zone; **ADNL-** A-weighted day-night levels; **CDNL-** C-weighted day-night levels; **PK 15(met)-** Single event peak level exceeded by 15 percent of events; **N/A-** Not Applicable

Chapter 14 of AR 200-1 (DA 2007) outlines the major goals of the Army's noise program, which include:

- Control operational noise to protect the health and welfare of people, on- and off-post, impacted by all Army produced noise, including on- and off-post noise sources.
- Reduce community annoyance from operational noise to the extent feasible, consistent with Army training and materiel testing mission requirements.
- Actively engage local communities in land use planning in areas subject to high levels of operational noise and a high potential for noise complaints.

Activities that have the potential to produce noise at Fort Huachuca include construction, military and private vehicle use, aircraft operations, weapons discharge, and dismounted training (USACE 2008).

Construction activities can generate noticeable levels of noise. A single item of construction equipment may generate noise levels of 80 to 90 dBA at a distance of 50 feet. Numerous equipment items operating concurrently can produce relatively high noise levels within several hundred feet of active construction sites. Locations more than 1,000 feet from construction sites seldom experience significant levels of construction noise (USACE 2008).

Military vehicles use a mixture of public roads, on-post roads, and military vehicle trails. Vehicle type and speed influence noise levels produced. Vehicle speeds are relatively low on unpaved roads during vehicle maneuvers. Noise levels generated by High Mobility Multipurpose Wheeled Vehicle (HMMWVs) and two-axle military trucks are comparable to noise from medium trucks (about 65 to 70 dBA at 50 feet). Multi-axle heavy trucks would generate noise levels comparable to other heavy duty trucks (about 78 to 80 dBA at 50 feet). On average, peak noise levels drop by 15 dBA at a distance of 500 feet from the travel path (USACE 2008).

Noise related to airfield operations at LAAF are addressed by the Air Installation Compatible Use Zone (AICUZ) program. Fixed-wing manned flight operations produce the most prominent noises, while UASs generate relatively little noise. UAS support equipment and increased traffic to and from training and testing locations are also sources of noise relating to aviation activities. Activities associated with operating UASs tend to occur in and over sparsely populated areas, which reduces the number of receptors exposed to any level of noise caused by the events.

Noise impacts from weapons discharge at the live fire ranges are minimal to the human environment because of their remote location at the Fort away from any noise-sensitive land uses. In addition, dismounted training and testing activities, which include the use of generators, can result in short-term and localized noise. Noise associated with the portable generators used can be as loud as 80 dB (Mayberry 2010).

3.8.1.2 Off-post

Both the Sunnyside site and Willcox Playa testing sites are leased by the Fort for exclusive use of training and testing activities conducted by the military. Therefore, when they are not being used for military activities, the on-site noise would be limited to naturally-occurring noises and noise traveling on-site from the surrounding areas. The Sunnyside site is closer to Fort Huachuca than Willcox Playa, and would therefore be more likely to experience noises, such as those produced by aircraft flyovers, than the Willcox Playa site. The Sunnyside site is separated from the Fort by mountains, which block most noises generated on-post.

3.8.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to result in any direct noise impacts, as the lasers do not emit any significant audible sound. Indirect noise impacts under the Proposed Action include various military vehicles and equipment used at testing and training sites, such as trucks, portable generators, and military aircraft. The greatest noise impact would likely be

the use of military aircraft during the EPG's manned-aircraft laser testing activities. However, the Proposed Action is not expected to generate a significant increase in the amount of aircraft activities currently being conducted by the Fort. To help minimize noise impacts, pilots avoid populated areas sensitive to aircraft noise. Manned aircraft used during the EPG testing typically flies at altitudes higher than 15,000 ft and will have little impact to noise conditions on the ground. Additionally, the Proposed Action does not include the introduction of any aircraft or any other vehicles or equipment not already being used by the Fort either on- or off-post.

Construction activities associated with the construction of the new runway and aircraft covering structure would be temporary in nature and only last the duration of the construction period. Due to the small-scale of the project and its remote location within the East Range, the noises generated during construction are anticipated to result in less than significant impacts.

Alternative Two

Noise impacts under Alternative Two are anticipated to be similar but less than those associated with the Proposed Action, as the number of available testing areas would be reduced. No significant impacts are anticipated.

No Action Alternative

The No Action Alternative would not result in any noise impacts.

Cumulative Impacts

Noise in and around Sierra Vista has steadily increased as the community has grown into a small city supported by an active military installation. Noises associated with Fort Huachuca could grow as mission requirements change. Most of the noise created by military vehicles is comparable to typical existing civilian traffic noises off-post. Operations that require equipment with increased noise levels, such as generators, are typically in more remote areas that are further way from adjacent populations. Due to the temporary and mobile nature of the indirect noise associated with proposed laser testing and training, none of the Alternatives are anticipated to result in cumulative noise impacts.

3.9 Visual Resources

3.9.1 Affected Environment

3.9.1.1 On-post

Much of Fort Huachuca consists of open space and areas of natural habitat that provide an aesthetically pleasing landscape from both within and outside the Installation boundaries. Fort Huachuca recognizes the importance of maintaining the natural beauty and unique landscape of the Installation.

The East Range consists primarily of open rangelands and grasslands and is used for range and training exercises. This is the only area on the Installation used for CLFR exercises. Portions of the East Range are visible from the City of Sierra Vista, located south of the East Range, and from Huachuca City, located northwest of the East Range.

The South and West Ranges are mostly open grasslands and mountainous areas, used for range and training exercises. The ranges are located in the foothills of the Huachuca Mountains, which serve as the Installation boundary for the Western Reservation. Some areas within the South Range are restricted land use areas to maintain wildlife habitat and provide outdoor recreational space. There is minimal military development within the South and West Ranges, providing the City of Sierra Vista and the Cantonment Area with a natural view of the Huachuca Mountains. There is little urban development located to the north, west or south of the West Reservation.

3.9.1.2 Off-post

Both the Sunnyside site and the Willcox Playa site are undeveloped sites. Sunnyside is in open grassland within the Coronado National Forest with unobstructed views of the Huachuca Mountains to the north and Mexico to the south. Willcox Playa is an extremely flat dry lake bed that is within the Willcox Basin. Willcox Playa is surrounded by mountain ranges, with the Pinaleno Mountains visible to the north, the Dos Cabezas range to the east, the Chiricahua Mountains to the southeast, the Dragoons to the southwest, the Little Dragoons to the west, and the Galiuros to the northwest. Little urban development is seen in either area, except for the town of Willcox and Interstate 10 which are approximately three miles to the north of Willcox Playa.

3.9.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to result in any significant direct or indirect impacts to visual resources. Direct impacts are limited to the visibility of the laser beams while the laser is in use, and the visibility of the laser and associated equipment and personnel during laser testing and training activities. Many of the laser platforms are mobile, such as ground vehicles, UAVs, and aerostats, and are already being used by the Fort. Although, some of the laser platforms, such as buildings and towers, are stationary, the lasers that would be installed on them would not be large enough to significantly alter the overall appearance of the structure. Overall, the addition of lasers to most of these platforms will go largely unnoticed to observers not involved in the testing or training activities.

Many of the lasers proposed for use under the Proposed Action are invisible to the human eye and would therefore not create any impacts to visual resources. However, some lasers, such as visible tactical lasers, can be seen by the human eye. Additionally, some invisible lasers cannot be seen with the human eye alone, but can be seen using optical aids like night vision goggles.

Although some of the lasers proposed for use generate visible laser beams, the short duration of the testing and training activities would not be expected to significantly impact the viewshed from on- or off-post. Daylight activities generating visible laser beams would be unlikely to be seen by the public. Some nighttime laser activities may generate beams visible by the public, but the short duration of the activity would limit any possible impacts to views of the night sky. Laser beams generated during proposed testing and training activities would have specific targets and would not be aimlessly pointed at objects on the Installation or at off-post sites. There is a small potential that visible lasers beams could be deflected off-post, but there would be no intentional targeting of objects outside specified testing and training areas.

The area where the new runway and aircraft covering structure would be located is on a part of the East Range that is not visible from populated areas surrounding the Installation. Since the site is already used as a gravel taxiway for UAS, the conversion to a paved runway would not greatly alter the current aesthetics of the site. The small-scale and simplicity of the aircraft covering structure would not greatly affect the area either.

Alternative Two

Visual resource impacts under Alternative Two are anticipated to be similar to those impacts associated with the Alternative One. Alternative Two does not include laser testing on the West Range, Willcox Playa, or Sunnyside areas. Therefore, visual resources at those areas would not be affected.

No Action Alternative

The No Action Alternative would not result in any impacts to visual resources.

Cumulative Impacts

Pristine high desert views in the Sierra Vista area have diminished over time as urban development views have emerged. The State of Arizona in general consists of highly aesthetic views that continue to be influenced by human activity. Throughout the state and concentrated along the southern border, more military and law enforcement personnel and equipment can be observed within natural environments due to illegal alien activity and national terrorism threats. It can be anticipated that views throughout the state will continue to change as the human population and its interactions change.

Due to the temporary and limited duration of proposed laser testing and training events, and the limited potential for these actions to negatively influence visual resource conditions, no cumulative impacts to visual resources are anticipated to result from implementation of any of the Alternatives.

3.10 Socioeconomics

3.10.1 Affected Environment

3.10.1.1 On-post

Socioeconomic resources are defined as basic attributes associated with the human environment, primarily population and economic activity. Population encompasses the magnitude, characteristics, and distribution of people, and economic activity refers to employment distribution, business growth, and individual income. The Region of Influence (ROI) subject to this analysis includes Cochise and Santa Cruz Counties.

Fort Huachuca is located in the City of Sierra Vista, Cochise County, Arizona. Sierra Vista is the largest city in the county with a population in 2010 of 43,888 and an estimated population in 2011 of 46,109 (U.S. Census 2010). U.S. Census 2010 data shows that the total population for Cochise County was 131,346, and has increased to an estimated 133,289 in 2011 (U.S. Census 2010). Both the City and the County's economy heavily rely on Fort Huachuca. The Installation has historically been and is currently the single largest employer in Cochise County. Other major industries in the County include services, retail trade and construction (JLUS 2007). The Town of Huachuca City is also located within Cochise County and is closely tied economically to Fort Huachuca. The U.S. Census 2010 population for the Town is 1,853 (U.S. Census 2010).

According to the September 2011 Fort Huachuca Post Population Count, the Installation had 14,707 full-time employees as of September 2010. Of that, 2,978 were permanent military personnel, 3,600 civilian personnel (full time equivalent (FTE)), 249 part-time civilian personnel, 3,051 students (FTE), and 4,657 full-time and 172 part-time contractors (personal communication with Kim Mulhern 2012). Historically, the Installation's population has fluctuated by about 3,000 personnel to meet changing mission requirements and account for training cycles.

The City of Sierra Vista's unemployment rate for the year 2010 was 5.4 percent and 8.0 percent in 2011 (AZSTATS 2012), which is lower than the current Cochise County rate of 8.8 percent, state rate of 8.3 percent, and national rate of 8.1 percent (AZSTATS 2012, BLS 2012). While some missions will change over time, employment at Fort Huachuca is predicted to remain constant or increase slightly according to Fort Huachuca personnel. In addition, there is expected to be a growth in tenant operations that will allow for additional contract employment at the Installation.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, ensures fair treatment and meaningful involvement of all people regardless of race, color, national origin or income, with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fort Huachuca is not located in an area that has a disproportionately high concentration of minority or low income populations.

3.10.1.2 Off-post

Sunnyside Training area is located in both Cochise County and Santa Cruz County. The one-acre site on Sunnyside proposed for laser use is located in Cochise County. Santa Cruz County is the smallest county in Arizona with a U.S. Census 2010 population of 47,420 (U.S. Census 2010). The City of Nogales, located in Santa Cruz County, is a major point of entry along the International Border with Mexico. The Department of Homeland Security is the largest employer in the County, due to its location along the International Border. Tourism and cross-border commerce contribute largely to Santa Cruz County's economy, and communities are recognized for their natural and scenic beauty and historic landmarks (JLUS 2007).

Willcox Playa is located in Cochise County, approximately three miles south of the City of Willcox. The City's population in 2010 was 3,757 (U.S. Census 2010).

3.10.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action would not result in an increase in the EPG or 2-13th's full-time personnel. Although the addition of laser testing capability would offer new opportunities for agencies and organizations to test lasers through the EPG, the testing activities would not result in the direct permanent relocation of personnel to the Fort or surrounding area. Therefore, there would be no impacts to the population on the Fort or in the surrounding ROI. There would be no adverse impacts to minority or low-income populations.

As a result of the new laser testing capabilities, personnel from agencies and organizations that would use the EPG for testing activities may visit the Fort for part or all of the duration of testing. These visits could result in temporary lodging on or off the Fort, which would provide beneficial impacts to the local economy. Additionally, the construction of the new runway and aircraft covering structure would likely be completed by local contractors, which would provide a short-term indirect beneficial impact to the local economy through local employment and materials sales.

Alternative Two

The impacts associated with the implementation of Alternative Two would be expected to be similar in nature to those of the impacts associated with Alternative One. Short-term beneficial impacts to the local economy may be less than those under the Proposed Action, based on the reduction of available testing areas. No significant impacts to socioeconomics are anticipated.

No Action Alternative

Implementation of the No Action Alternative would not result in any impacts to local or regional population or economy.

Cumulative Impacts

No significant cumulative impacts are anticipated as a result of the implementation of any of the Alternatives. Since there is no increase to population, no cumulative impacts to the ROI's population would be expected. The beneficial impacts to the local economy associated with Alternative One and Alternative Two would have minor, long-term beneficial impacts when combined with the growth and development on and around the Installation.

3.11 Transportation and Circulation

3.11.1 Affected Environment

3.11.1.1 On-post

The main highway access to Fort Huachuca is Arizona State Highway 90, which divides the Installation into the East and West Reservations. The Main Gate is located immediately west of Highway 90, at the end of Fry Boulevard, which is a commercial roadway that runs through the City of Sierra Vista. The Main Gate is the most heavily used access gate on the Installation (USACE 2008). The 2005 Northwest Cochise County Transportation Planning Study states that Highway 90 is operating at the highest level, Level of Service A (Cochise County 2005). Further, this report states that Highway 90 will reach Level of Service C when traffic counts reach a daily capacity of 24,400 vehicles and a Level of Service D at 30,600 vehicles (Cochise County 2005). More vehicles than 30,600 under current configurations will result in traffic that exceeds acceptable standards or is failing. This plan is in the process of being updated. Preliminary materials from the planning process state that Highway 90 is continuing to operate at a high level (ADOT 2009a). Traffic counts along Highway 90 in the vicinity of the Main Gate have shown an increase in vehicles between 2006 and 2008, with an annual average daily traffic (AADT) count of 14,988 vehicles in 2006, 16,175 vehicles in 2007, and 16,369 vehicles in 2008 (ADOT 2009b). These counts are well below the Level of Service D threshold.

There are two other gates providing access to the Installation, the East and West gates. The East Gate and its control point are currently located east of the intersection of Brainard Road and Carter Street, resulting in the closure of both Brainard Road and Carter Street. The West Gate is located near the Blacktower area of the Installation's West Range. The West Gate provides access to individuals who live west of the Installation, preventing them from having to drive approximately 30 minutes around the Installation to use the Main or East gates (USACE 2008). A North Gate also exists on the Installation but is not functional and is not currently in use.

The existing road network on Fort Huachuca provides access to all operational and residential areas on the Installation. There is approximately 200 miles of paved roadways, 130 miles of gravel roads, and 150 miles of firebreak roads and trails located on the Installation. The overall condition of the roadway system is good (USACE 2008) and adequately serves approximately 15,405 people currently living and/or working on the Installation. Traffic studies have shown that

traffic volumes are greatest during two, hour-long periods in the morning and evening as people report to and from work, with peak hours occurring between 645 and 745 and 1600 and 1700. A third peak travel time occurs around 1200 as a result of lunch hour traffic. Overall, the Installation has little to no congestion and minimal delays (USACE 2008).

Primary roads are the main routes that connect the Cantonment Area with the off-post transportation network and provide access between different land uses on the Installation. The primary roads carry the highest traffic volumes and often allow for higher travel speeds. Primary roads within the Installation include Allison Road, Hatfield Street, Lawton Road, Smith Avenue, Squire Avenue and Winrow Avenue. Winrow Avenue provides the main access to and from the Main Gate. Installation traffic is controlled at intersections using a variety of means, including traffic circles, stop signs, and traffic signals (USACE 2008).

Roads serving the training areas within the three ranges are mostly unpaved. Due to the erosive character of the soils on the Fort, the condition of the unpaved roads varies, and in some cases, the roads are severely eroded. In addition, a number of roads within the ranges have been closed but have not been rehabilitated. These roads channel surface runoff in some cases and gully and headcutting are occurring.

Airfield activities primarily occur at LAAF, which includes a 12,000 foot-long runway, providing service to Fort Huachuca and the City of Sierra Vista Municipal Airport. Other airfield activities occur on the range and training lands outside of the Cantonment Area and include operations at Hubbard landing strip on the East Range, Rugge-Hamilton and Pioneer landing strips on the West Range, and more than a dozen helipads throughout the Installation (USACE 2008).

No rail service to Fort Huachuca is available. The closest rail service is located in Benson, Arizona, which is approximately 30 miles north of the Installation. The City of Sierra Vista Public Transit System provides daily bus transportation to the public, with stops located throughout Fort Huachuca and the City of Sierra Vista (USACE 2008).

Military vehicles use a combination of public roads, Installation roads, and military vehicle trails. Vehicle convoys using public roads typically are limited to no more than 24 vehicles in a group. Vehicles within a convoy group (also called convoy serials) usually are spaced about 165 to 330 feet and at least 15 to 30 minutes apart. These convoy procedures reduce noise levels and prevent the convoy vehicles from dominating local traffic flow for long periods of time (USACE 2008).

3.11.1.2 Off-post

There are no roads located on the Sunnyside site. Main access to the site is from Forest Road (FR 48) via Lochiel Road. The site is fenced and gated and during testing activities it is a controlled access site. The closest air, rail, and other transit services would be the same as those available on-post.

The Willcox Playa site is accessible from U.S. Route 191, via Interstate 10. The area is fenced, but not secured, as the fence is downed or damaged in many locations. A network of dirt roads is located throughout the site. A railroad runs through the western portion of the site. The closest access to rail service is the train station in Benson. The closest air transportation is the Cochise County Airport located several miles north of the site.

3.11.2 Environmental Consequences

Alternative One (Proposed Action)

Anticipated impacts to transportation and circulation within the Fort and surrounding communities would be less than significant. On-post roads are designed to handle the traffic created by military vehicles and convoys, including additional volume created by the EPG's laser testing vehicles and the 2-13th's UAS. The addition of new testing capabilities is not anticipated to have a significant effect on traffic volume on Fort Huachuca.

Aircraft traffic is not anticipated to significantly increase beyond current EPG and 2-13th flight levels. Although specific laser testing using aircraft has not been determined by the EPG, they do not anticipate the introduction of any aircraft that is not already in use by the Fort. The 2-13th training activities are not using any new UAS that are not currently used by the Fort, and they do not anticipate their number of UAV flights to significantly change. The 2-13th's lasers would be incorporated into training activities that are already being conducted and would continue to use established flight patterns. In the event that laser testing or training activities requires the introduction of new aircraft, those activities would be evaluated to ensure that the aircraft would not have significant impacts. Additionally, all training and testing activities would be coordinated and scheduled through the appropriate channels before any exercises could begin. All flights are coordinated through the air traffic controller at LAAF to ensure that there are no airspace conflicts. All aircraft testing and training activities must use approved flight paths and comply with all applicable laws, regulations, and policies governing airspace on and around the Fort. Therefore, no adverse impacts to air or ground traffic would occur.

Impacts to off-post traffic would also be less than significant. The roads that provide access to the Willcox Playa and Sunnyside sites are currently used by the Fort to access them for testing and training activities. No significant impacts to the airspace surrounding the Fort are anticipated since the addition of lasers to testing and training activities is not expected to significantly increase the overall number of flights conducted by the Fort on a regular basis.

Due to the small scale of the taxiway conversion project and new construction of the aircraft covering structure, the addition of necessary construction-related vehicles is expected to have a minor, short-term impact to transportation and circulation.

Alternative Two

Transportation impacts under Alternative Two are anticipated to be similar to those expected under Alternative One. However, they would be expected to be slightly less based on the reduction of available testing areas under Alternative Two.

No Action Alternative

The No Action Alternative would not result in any impacts to transportation or circulation on or around the Installation.

Cumulative Impacts

Due to Sierra Vista's and the surrounding communities' location adjacent to the national border, Interstate 10 and Highway 90 will continue as the main vehicular access to the community. A network of smaller roads connects other parts of the county to Sierra Vista and Fort Huachuca. Roadway level of service has been studied for main access roads and proposed upgrades determined. An expanded freeway interchange, which is part of the recommended upgrades, is under construction. The existing immediate roadways adequately serve the needs of the surrounding civilian communities and the mission of Fort Huachuca. The main thoroughfares providing access to Willcox Playa and Sunnyside sites are also adequate to handle traffic volume increases in the reasonably foreseeable future.

The RPMP for Fort Huachuca provides a list of identified transportation-related improvements to be addressed in future years to keep pace with development trends and provide a safe on-post environment. The Northwest Cochise County Long-Range Transportation Plan Final Report includes projects to address future deficiencies on the Highway 90 and projects to provide better connectivity within the immediate county.

With plans in place that anticipate growth in transportation needs for Sierra Vista area, Fort Huachuca and state-wide, proposed laser testing and training activities under any of the Alternatives are not anticipated to contribute to adverse cumulative impacts on transportation at the local or regional level.

3.12 Utilities

3.12.1 Affected Environment

3.12.1.1 On-post

Tucson Electric Power and Sulfur Springs Valley Electric Cooperative supply electrical power to Sierra Vista, Fort Huachuca and the surrounding area. The Installation is served by six underground distribution circuits, which transfer to overhead poles. The existing distribution system adequately supports the current and future needs of the Installation (USACE 2008). Existing renewable energy systems located on the Fort include solar hot water heaters; photovoltaic flat panels and combined integrated systems; daylighting; photovoltaic parking lot

lighting; solar walls; a methane digester processor; a wood chip burner; GHPs at new barracks; a 10 kilowatt (kW) wind tower; and a 1 megawatt (MW) wind turbine.

Natural Gas is provided to the Installation by Southwest Gas. Gas is delivered via two 400 pounds-per-square-inch supply lines and distributed throughout the Installation. The system capacity is adequate to support current and future demands.

Solid waste accumulated at the Installation is transported off-post and primarily disposed of at the Huachuca City landfill. A small amount of solid waste is directed to the Elfrida landfill, which is also located in Cochise County. In addition to these landfills, there is a County operated landfill located in Huachuca City.

The only water supply at Fort Huachuca is groundwater from the Sierra Vista subwatershed regional aquifer. Fort Huachuca's water system is operated and maintained by an Installation service contractor. There are eight operational groundwater production wells on the Installation. Water is treated prior to entering the supply lines and the quality of the water is generally suitable for all uses. The greatest demand on the water supply comes from the Installation's housing area. A water conservation program was developed to educate the Installation residents and personnel on methods to conserve the water supply. Other conservation methods are also implemented at Fort Huachuca, including the use of treated wastewater effluent rather than potable water for irrigation and recharge. Water supply and storage at Fort Huachuca is adequate to meet current and future demands (USACE 2008).

The Fort Huachuca wastewater collection and treatment system is operated and maintained by an Installation service contractor. Installation wastewater is directed to a single treatment facility. Most wastewater naturally flows to the treatment facility; however some areas, such as a small portion of the housing in the southeastern Cantonment Area, require wastewater to be pumped through a lift station. After treatment, wastewater is directed to seven effluent recharge basins located on the East Range or reused as irrigation water for the golf course. The current wastewater system at Fort Huachuca is adequate for current flows and could handle up to six times the amount of wastewater (USACE 2008).

The existing storm drainage system at Fort Huachuca is made up of natural drainage ways, channelized improvements and open culverts under roadways. Evaluations of the system have identified undersized channels, constricted culverts and portions of the Cantonment Area that periodically flood. The RPMP identifies the need for a comprehensive study to evaluate and subsequently improve the system (USACE 2008).

3.12.1.2 Off-post

No utilities are located at either the Sunnyside site or the Willcox Playa site. When necessary, the Fort supplies portable utilities, such portable toilets, portable potable water, portable communications trailers, and portable electric generators to the sites during testing and training

activities. All equipment brought on-site and waste generated on-site is removed from the site after training activities are complete.

3.12.2 Environmental Consequences

Alternative One (Proposed Action)

The Proposed Action would not result in any significant impacts to utilities on- or off-post. The lasers would not require the addition of any new electrical, telecommunications, water, or wastewater lines. Additionally, the lasers would not result in a significant increase of solid waste generation. The lasers would be powered directly either by batteries, diesel-generators, or external supplies from the platforms they are attached to. Therefore, there would be a slight indirect increase on the demand for electrical power, since batteries may require re-charging through traditional electrical outlets. However, this increase would be so minuscule that it would not result in a significant increase in overall electrical demand at the Fort.

Construction activities associated with the taxiway conversion and construction of the aircraft covering structure on the East Range would not result in any impacts to utilities on the Installation. There are no on-site utilities to be used during construction. Solid waste generated during construction is expected to be minimal and would be disposed of off-site by the contractor in accordance with all applicable laws and regulations. Additionally, operational activities associated with the training area would not use any Installation utilities and no utility lines will be extended to the site. Power at the site will be solar-generated by panels proposed for installation on the roof of the aircraft covering structure. Restrooms on the site will be self-composting and will not discharge into the Installation's sanitary sewer system. Potable water will be stored in approved containers on-site and will not tie into Installation water lines.

Off-post testing activities at the Willcox Playa and Sunnyside sites do not utilize on-site utilities. Portable diesel generators are used for power, potable water is brought on-site in approved containers, and portable toilets are brought on-site during the duration of testing activities. Once testing activities are completed, the EPG removes all portable utilities from the site. There is no long-term storage of any portable utility devices on the off-post sites.

Alternative Two

Impacts associated with Alternative Two would be expected to be similar to those associated with Alternative One. There may be slightly less impact due to the reduction of available testing areas proposed under Alternative Two.

No Action Alternative

There would be no impacts to utilities on- or off-post as a result of implementation of the No Action Alternative.

Cumulative Impacts

The growth and development on and around the Installation continues to increase the demand for utilities such as electrical, telecommunications, water, and wastewater. Fort Huachuca is continuously working to reduce the Installation's demand for non-renewable resources, as documented in their 2010 Renewable Energy Resources PEA (USAGFH 2010b). The Fort has entered into agreements and partnerships with other groups and agencies for the purpose of reducing water use in the USBP. In addition, Fort Huachuca is an active member of the Upper San Pedro Partnership, a consortium of 21 agencies that collaborates to meet water needs in the region while protecting the San Pedro River (USACE 2008). As the use of water on the Fort decreases, the amount of wastewater reaching the Fort's WWTP and ultimately the recharge basins also decreases. The Fort's and surrounding communities' reduction in water use and increased use of renewable energy sources is not only beneficial to the environment, but decreases the demand on existing utilities and necessity for new utilities. The less than significant impacts expected from implementation of any of the Alternatives are not expected to result in any cumulative adverse impacts.

3.13 Hazardous and Toxic Substances

3.13.1 Affected Environment

3.13.1.1 On-post

Hazardous materials (HAZMAT) is a term referring to any item or agent (biological, chemical, and physical) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Across the Army, the Hazardous Material Management Program (HMMP) is used to integrate the accountability for HAZMAT into day-to-day decision-making, planning, operations, and compliance across all Army missions, activities, and functions. The HMMP policies, including its objectives and goals, are set forth in AR 200-1 (DA 2007). A complete list of federally-recognized hazardous substances as well as their reportable quantities is provided in 40 CFR Part 302.4. There are many other substances which are not on this list that may be considered hazardous according to their ignitability, corrosivity, reactivity, or toxicity as defined by 40 CFR 261.20-24.

Fort Huachuca is an EPA-registered large quantity generator, defined as generating 1,000 kilograms per month or more of hazardous waste, more than 1 kilogram per month of acutely hazardous waste, or more than 100 kilograms per month of acute spill residue or soil. Vehicle and aircraft maintenance produce the majority of hazardous wastes generated by the Installation, and facility maintenance may also contribute. Hazardous substances typically associated with these operations such as fuels, antifreeze, paints, cleaners and petroleum, oil and lubricants (POL) are stored, transported and disposed of in accordance with applicable laws and regulations. The Hazardous Waste Management Program at Fort Huachuca complies with OSHA hazardous communications standards and EM 385-1-1 materials handling, storage, and disposal standards; the Installation Spill Contingency Plan; the Installation Hazardous Waste

Management Plan; Department of Transportation regulations; and the Directorate of Public Works (DPW) Environmental Office (USACE 2008).

The Fort operates one 90-day accumulation center, approximately 200 satellite accumulation centers and a Hazardous Material Control Center, which allows for collection and withdrawal of usable hazardous materials on the Installation. Frequent inspections of hazardous waste storage and disposal sites are conducted by the DPW Environmental Office and state and federal regulatory agencies. The Defense Reutilization and Marketing Office (DRMO) provides contract service to transport and dispose of hazardous waste off-post.

Facilities that store, transport, dispose of, or utilize POLs at the Fort are strictly regulated by Federal and Department of Defense (DoD) regulations. The fundamental purpose of Federal and DoD regulations is to prevent or limit the accidental release of POL materials to surface water, groundwater, or soils at Fort Huachuca. Specific areas of regulatory focus are spill prevention plans, POL transfer operations, POL storage in containers, and used oil. The policy defined by AR 200-1 requires Fort Huachuca to “manage tank systems used to store oil and hazardous substances in an environmentally safe manner, prevent spills of these substances, and rapidly respond to spills.” Among other things, AR 200-1 requires the development of an Installation Spill Contingency Plan (ISCP) as well as a Spill Prevention Control and Countermeasures Plan for storage tank systems that hold POLs or hazardous substances. Response resources for Fort Huachuca are mobilized at the direction of the Qualified Individual (QI) or Facility Incident Commander (FIC). However, location and PPE requirements will dictate which unit initially responds and completes the response action.

Incident response priorities are established using prudent spill response procedures. Fort Huachuca’s priorities are to protect against loss of life, fire/explosion, and release transport, respectively. All unit hazardous material coordinators are responsible for making all necessary emergency equipment available for the response action.

Spills may occur from mobile units such as fuel tanker trucks, trucks with fuel pods, or trucks carrying hazardous material/waste as well as aircraft that are parked, landing, or taking off. Any spills occurring from mobile units and aircraft must call 911 immediately. Response strategies involving these types of mobile units are handled in the following manner:

- Truck incidents – Incident most likely to be a road side accident involving an overturned vehicle. Response by the Fire Department (FD) and the FD HAZMAT unit for initial containment and fire suppression. Additional containment and clean-up by the DPW contractor.
- Aircraft incident – Initial response conducted by the Airport Rescue Firefighting (ARFF) crew located at Fire Station #3 with support from the FD HAZMAT unit for initial containment and fire suppression. Additional containment and clean-up by the DPW contractor.

- Unmanned Aircraft Systems (UASs) – all incident response, clean-up and investigation is conducted by the Garrison Response Team. Additional containment and clean-up by the DPW contractor.

The Army's Installation Restoration Program (IRP) is a comprehensive program to identify, investigate, and clean up contamination at Army Installations to eliminate risks to human health and the environment. The IRP includes, but is not limited to, the cleanup of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances, POLs, hazardous wastes and hazardous waste constituents, and low-level radioactive materials or wastes. Historically, there have been 58 IRP sites at Fort Huachuca (USACE 2008). The Fort Huachuca Installation Action Plan, dated 20 May 2009, identifies two remaining IRP sites in long-term management and two sites pending a No Further Action (NFA) determination from ADEQ.

The South Range Landfill (FTHU-10) is an approximately 100-acre former landfill site located two miles southeast of the main cantonment facilities. The landfill was used from 1940 to 1975 as a dump site for household garbage, pesticides, herbicides and sodium arsenite. Initial investigations at the site were performed in 1993 and semi-annual, groundwater monitoring and reporting have occurred since 1999. Analysis of the groundwater samples taken from five monitoring wells at the site have detected elevated levels of heavy metals and pesticides (USACE 2008). Groundwater monitoring is planned from FY10 through FY13 and a five-year review is planned for 2014 (USAEC 2009).

The East Range Mine Shaft (FTHU-65) is located in the remote East Range. The mine shaft was believed to be used from the 1940's to an undetermined point in time for disposal of garbage, POLs, aircraft parts and possibly unexploded ordnance (UXO). Lead contamination in soil and groundwater is an issue. Fort Huachuca is working with the ADEQ to monitor the site and a five-year review is currently being conducted (USAEC 2009).

Greely Hall underground storage tank (UST) Release site (FTHU-85) is located in the rear southern service area of Greely Hall (Building 61801) in the Cantonment Area. Fuel to power the emergency generators at Greely Hall was historically stored in USTs at the site. The piping system was estimated to be leaking diesel fuel for approximately ten or more years. Elevated levels of total petroleum hydrocarbons (TPH) confirmed soil contamination at the site. A bioremediation system was installed at the site in 1997 and bio-venting occurred until remediation was complete. The system has been removed and the Fort is working with the ADEQ to receive a NFA determination.

Greely Hall Gasoline Release site (FTHU-90) is also located at the rear southern area of Greely Hall. A gasoline UST that was used until the 1970s to provide fuel to emergency generators was removed in 1995. Elevated levels of benzene confirmed soil contamination from years of gasoline spillage at the site. A Soil Vapor Extraction (SVE) system was installed in 2000. The SVE operated until cleanup standards were met. The system has been removed and the Fort is working with the ADEQ to receive a NFA determination (USAEC 2009).

The Army's Military Munitions Response Program (MMRP) was established in 2001 to manage the environmental, health and safety issues associated with UXO, discarded military munitions (DMM) and munitions constituents (MC) at closed, transferring or transferred ranges. An inventory of MMRP eligible ranges was conducted in 2003 and identified fifteen Munitions Response Sites (MRS); three small arms ranges and twelve multiuse ranges. The Site Inspection (SI) phase of the MMRP was initiated in 2005 and completed in 2008. Of the fifteen MRS, thirteen were not carried forward from the SI phase to the Remedial Investigation (RI) phase. The RI field inspections for the remaining sites have been completed and a report is in preparation. Only one site is planned to be carried forward for a Feasibility Study. There is a potential for munitions and explosives of concern (MEC) and MC to be present at these sites. The MMRP does not assess the conditions of active ranges; however, there is potential for MEC, MC, or UXO to occur on active ranges as well. Lead contamination is also an issue at ranges.

3.13.1.2 Off-post

No hazardous or toxic substances are stored at the Sunnyside site or Willcox Playa site. Any hazardous materials used on-site during testing or training activities are managed in accordance with applicable laws and regulations, just as they are on-post. Spills that occur off-post are managed in the same manner as those that occur on-post and any hazardous waste generated off-post is removed from the site and disposed of in accordance with applicable laws and regulations.

3.13.2 Environmental Consequences

Alternative One (Proposed Action)

Implementation of the Proposed Action is not anticipated to cause any significant impacts resulting from the use of hazardous or toxic substances. The lasers proposed for use at the Fort are all solid state lasers. The solid lasing mediums associated with these lasers are typically crystals and are not a hazardous or toxic substance. Some solid state lasers may contain small amounts of hazardous substances that may require special storage, handling, or disposal techniques. However, appropriate use of the laser would greatly reduce the risk of any exposure to these substances. Additionally, these types of lasers do not generate any hazardous or toxic by-products or waste, like some other types of lasers. Some laser components could contain lead, and many are powered by batteries, which may have specific handling, storage, and disposal requirements that would be required to be coordinated with the ENRD. The majority of batteries associated with the lasers proposed for use at the Fort would either be common household-use alkaline or lithium batteries (i.e. AA, AAA, etc.) or recyclable deep-cycle batteries, which would be solar-charged, with a life expectancy of 3 to 5 years. Although the use of these batteries would slightly increase the number of batteries being disposed of or recycled by the Fort, no significant impacts to the Fort's overall waste stream are anticipated.

The laser platforms proposed for use within this EA (i.e. ground vehicles and aircraft) are already being used by the Fort during testing and training activities. Therefore, the proposed laser testing and training would not result in any new risks associated with the use of those vehicles and equipment.

Fort Huachuca's current policies and procedures will minimize impacts from the use of hazardous or toxic substances during the implementation of the Proposed Action. In accordance with training requirements set forth in AR 200-1 and the procedures defined in Fort Huachuca's ISCP, vehicle and equipment operators are expected to be well-versed in the proper measures and notification processes necessary to handle accidental spills of hazardous or toxic substances including POLs. Equipment, such as portable generators, utilizes the latest safety technology including double-walled containers which prevent leaks. Volumes of hazardous or toxic materials at any given testing location are minimal and would not pose a major threat to human health or safety. Vehicles are outfitted with drip pans, plastic sheeting, and spill kits, which are used to prevent and clean up accidental spills (Hougland 2011).

Construction-related activities associated with the conversion of the taxiway and construction of the new aircraft covering structure would not result in any significant impacts from the use of hazardous or toxic substances. The construction contractor would be responsible for the appropriate disposal of all waste generated during construction in compliance with applicable laws and regulations. There would be no significant impacts from operational use of the site. No hazardous or toxic substances would be stored in the aircraft covering structure. If the UAVs experience a mechanical issue while operating at the site, some maintenance activities may be performed such as navigation/strobe light replacement or brake adjustments. No hazardous waste is anticipated to be generated during potential on-site maintenance activities. In the event of an emergency or need for major repair, UAVs may be transported to the LAAF for repairs and maintenance. The 2-13th would maintain adequate spill response and containment equipment on-site during operations and would comply with Installation policy in the event of an accidental spill.

Alternative Two

Implementation of Alternative Two would result in similar impacts as those associated with the implementation of Alternative One. Therefore, no significant impacts are anticipated.

No Action Alternative

Under the No Action Alternative there would be no impact to hazardous or toxic substances.

Cumulative Impacts

The quantity of hazardous and toxic substances stored and used on and in the area surrounding Fort Huachuca has grown over the years. Today, Fort Huachuca has a Hazardous Waste Management Program, an Emergency Planning and Community Right to Know Program, a Pollution Prevention Program, and several other hazardous materials handling programs and

manuals to direct the use of these materials. Fort Huachuca additionally has a Hazardous Material Control Center whose purpose is to centrally manage and issue hazardous material as well as take back unused material that can be reissued, and works with the Defense Logistics Agency-Dispositions Program to manage the disposal of hazardous waste. Accidental spills of any size may occur no matter how many manuals and policies are in place, but materials and guidelines for dealing with the spills are more sophisticated, effective, and time responsive today than in the past. In addition, today's guidelines for handling hazardous materials are more proactive and equipment more appropriate for the required action, leading to fewer accidents.

Installation personnel have established safeguards to protect the environment from accidental spills of hazardous materials or POLs during testing and training activities. Fort Huachuca's ISCP describes the procedures to be implemented in the event of a spill of hazardous materials or POLs.

Due to the extensive policies and procedures in place for potential spills and mishandling of hazardous and toxic substances, and the limited types and quantities of hazardous materials and toxic substances, it is anticipated that none of the Alternatives would result in a cumulative local or regional impact from the use of hazardous and toxic substances.

3.14 Human Health and Safety

3.14.1 Affected Environment

3.14.1.1 On-post

Health and safety services can be obtained on Fort Huachuca and within the surrounding communities. Law enforcement is provided by community police forces and the Arizona Department of Public Safety, which is a state-wide law enforcement agency. On Fort Huachuca, the law enforcement division of the Directorate of Emergency Services has primary responsibility for the enforcement of rules and regulations and the security of the Installation (USAGFH 2004).

Medical services on Fort Huachuca can be received at the Raymond W. Bliss Army Health Center. This center provides services to active and retired military personnel and their families. Services include primary care, internal medicine, general surgery clinic including outpatient services, orthopedics, physical therapy, optometry (active duty only) and preventive medicine (U.S. Army Medical Department 2011). Accidents or illness requiring emergency room treatment are handled at the Sierra Vista Regional Health Center (SVRHC) or other local medical emergency clinics as necessary. The SVRHC facility has an 88-bed acute care center, is staffed by 70 active, 37 courtesy and 9 Allied Health physicians and serves more than 7,600 patients annually (SVRHC 2011). More serious cases requiring emergency medical evacuation are sent to Tucson. The trip to Tucson by air takes approximately 12 minutes (USAGFH 2004).

Agreements between Fort Huachuca, Sierra Vista, Cochise County and the USFS are in place to provide mutual assistance in the event of a fire. The Sierra Vista Fire Department has three

fire stations (City of Sierra Vista 2009). Various fire districts respond to calls occurring in the county and can provide additional assistance to other agencies when needed. The Fry Fire District has one station located within Sierra Vista and two additional stations in outlying areas within the county (Fry Fire District 2012). Fort Huachuca also has three stations. Personnel from these stations respond to emergencies on the Fort, at LAAF, and in the surrounding area.

The USFS operates and maintains additional fire suppression facilities that are available to respond to forest and range fires within the Coronado National Forest, including lands within Fort Huachuca, pursuant to a cooperative agreement between the Installation and the USFS. The USFS has established a fire protection unit at LAAF and other units are stationed adjacent to Fort Huachuca (USAGFH 2004).

Fort Huachuca and the surrounding area have an active fire regime and wildland fires occur regularly. Fire management on the Fort is directed to meet the goals and objectives identified in the Fort Huachuca Integrated Wildland Fire Management Plan (IWFMP) (USAIC & FH 2006a). These goals include protecting life as the highest priority, protecting the Installation and personal property, managing fire to support military training, managing fire to protect natural and cultural resources, and coordinating fire operations with neighboring land owners. The plan addresses the management of both wildfires and prescribed burns as well as the treatment of areas supporting sensitive resources (natural and cultural). Fort Huachuca, the USFS, and the National Parks Service are also working together on the Huachuca FireScope Project. This project coordinates fire and fuel reduction activities between the three agencies. This project is intended to increase fire management flexibility, efficiency, and consistency across about 400,000 acres of adjoining federal land (USDA Forest Service 2009).

Range Control is responsible for coordinating and regulating activities on the ranges, supported by the law enforcement division and Fire Department. Ranges are secured and patrolled by Law Enforcement, while the Fire Department is responsible for fighting and extinguishing range fires and the scheduling of prescribed burns in conjunction with the ENRD. In addition, the Directorate of Public Works assists in maintaining fire breaks. Range Control regulations and standard operating procedures identify allowable range practices and precautions that must be taken (USAGFH 2004).

3.14.1.2 Off-post

Sunnyside

Due to its proximity to Sierra Vista, health and safety services will be able to be obtained from facilities identical to those for on-post activities. Additionally, as Sunnyside falls within the Sierra Vista Ranger District of the Coronado National Forest, Forest Rangers share the responsibility with the Arizona Department of Public Safety for patrol and law enforcement.

Willcox Playa

Fort Huachuca Range Control is responsible for coordinating and regulating activities on the Willcox Playa. Law enforcement is provided by community police forces and the Arizona Department of Public Safety, which is a state-wide law enforcement agency.

Accidents or illness requiring emergency room treatment are handled at the Northern Cochise Community Hospital (NCCH) in Willcox, AZ. The NCCH facility is one of three Level IV trauma centers in Arizona and provides 24-hour a day, 7 days a week emergency room coverage by board certified physicians and specially trained nurses and staff (NCCH 2012).

3.14.2 Environmental Consequences

Alternative One (Proposed Action)

Human health and safety related to the use of lasers is the primary concern associated with the implementation of the Proposed Action. In general, solid state lasers, when properly stored, used, and disposed of; pose very little risk to human health and safety. No significant direct or indirect impacts to human health or safety are anticipated.

The Fort has developed a SOP for the use of lasers, which establishes policies, defines responsibilities, and prescribes practices that will ensure personnel safety during laser testing and training operations within designated laser ranges at Fort Huachuca (USAGFH 2012a). The only areas proposed for laser use that are not included in the Laser SOP are the Sunnyside site and the Blacktail Test Facility, which are both managed solely by the EPG. The Sunnyside site would only be used for Class 1 laser testing and would not require any specific control measures outside of existing guidelines established for the site. The Blacktail Test Facility operates under a separate SOP, which would ensure that all appropriate safety measures are implemented during on-site testing. Additionally, the 2-13th is establishing SOPs specific to the UAS laser platforms proposed for use (2-13th 2012). All Fort laser testing and training will comply with applicable laws and regulations, including but not limited to ANSI Z136.1, ANSI Z136.6, AR 385-63, DA PAM 385-63, MIL-HDBK-828B w/change 1, TB MED 524, and JP 3-09.3.

As described in *Section 3.1 Introduction*, lasers are categorized into classes based on specific characteristics, including the potential for causing biological damages. The lasers proposed for use at the Fort would vary from Class 1 to Class 4 lasers. Each class of laser poses a certain potential for damaging radiation emissions and specific circumstances which must exist for the risk to be present. Although a laser classification designates a potential risk, it doesn't necessarily mean that the laser would actually cause harm. There are regulations and safety guidelines for each class of laser, specifying the proper usage and PPE level necessary for operation. Following regulations and complying with manufacturer instructions greatly reduce the risk to human health and safety.

When used properly, Class 1 and 2 lasers pose very little risk to human health and safety. Class 1 lasers are considered to be incapable of producing damaging radiation and require no control measures or PPE. Some Class 1M lasers may be slightly hazardous to the human eye if viewed for an extended period through an optical instrument, like a telescope. However, aside from ensuring that this type of laser use does not include optical instruments, requires no control measures or PPE. All Class 2 lasers are visible to the human eye, but pose very little risk of damage because of the eye's natural aversion response. Damage to the eye could result if the laser beam was aimed directly into the eye for an extended period of time. Additionally, if Class 2 lasers are viewed with an optical aid (i.e. telescope), the potential for eye damage could be slightly greater. However, no proposed testing or training activities target human eyes or any other part of the human body. The risk of incidental overexposure of the eye is almost non-existent.

Class 3a lasers pose a slightly greater risk of eye damage than Class 2 lasers, through direct and specular reflection viewing. However, the risk associated with the Proposed Action would be very small since no testing or training activities would target the human eye or any other human body part. Class 3b lasers may cause eye damage through direct or specular reflection viewing and in very rare instances may pose a diffuse reflection or fire hazard. Many Class 3b lasers require PPE, most commonly protective eyewear. Class 4 lasers can cause eye damage and can burn human skin. Class 4 lasers also pose the greatest fire hazard. Operations involving Class 4 lasers would require the greatest amount of control measures, including PPE which may include protective eyewear and clothing. The Fort's Laser SOP requires that an up-to-date roster be maintained for all personnel authorized to use Class 3b and Class 4 lasers. Additionally, in compliance with ANSI Z136.1, personnel are required to undergo a vision/ocular assessment prior to use of Class 3b and Class 4 lasers. In accordance with the Laser SOP, all Class 3b and Class 4 lasers shall not be directed above the horizon, unless previously coordinated through the Range Safety Office (USAGFH 2012a).

The Fort's Laser SOP requires that all requests for laser range usage be coordinated through the Range Safety Office at least 30 days in advance. All requests must be accompanied by a thorough Composite Risk Management Worksheet (DA Form 7566) and an Operations Order or Scenario depicting the scope of the operation and all safety procedures being utilized, as well as the class(es) of laser proposed for use. A Range Officer in Charge and Range Safety Officer will be appointed for all laser testing and training activities. These individuals will be in charge of the training/testing and will be knowledgeable of the laser system being used and its safe operation. They will ensure that all personnel involved in the testing/training wear applicable PPE and are adequately informed of the safe operation of the laser(s) being used through a Pre-admission/Safety Brief that will be conducted prior to the start of the testing/training activity. These individuals will also be responsible for maintaining radio communication with the Range Safety Office for the duration of the laser testing/training (USAGFH 2012a).

Prior to any laser testing or training, the target and target areas would be surveyed to ensure that there are no unauthorized personnel or wildlife that could be harmed, or any specular

reflectors (mirrors, glass, and still water) that could pose a risk to operations. For all aerial laser activities, a flyover over the entire testing/training area is required to ensure that these hazards are not present. In the event that any unsafe or marginally safe condition is noticed, or any unauthorized personnel or wildlife enter a restricted area, all laser operations would be suspended until the deficiency is corrected (USAGFH 2012a and 2-13th 2012). In

Although minimal, the potential for fire exists during the use of Class 3b and Class 4 lasers. Additionally, fires could indirectly be caused by overheating vehicles, a spark from small diesel powered generators, or cigarette smoking during laser testing or training. All personnel working at training and testing sites on- and off-post should have training on the fire risks associated with all vehicles and equipment on-site and know the appropriate emergency services numbers to contact in the event of a fire. As part of the review processes described in *Sections 2.1.4* and *2.1.5*, the potential for fire risk would be evaluated. If necessary, Range Control may restrict Class 3b and 4 laser use during dry seasons and times of drought. Additionally, Range Control may require that certain Class 3b and 4 laser operations maintain additional on-site fire suppression equipment, and/or notify fire department personnel in advance of the laser activities to alert them of the potential risk of fire or require that fire personnel be on-site during the operations as a precautionary measure. Although, Class 3b and 4 lasers carry a risk of fire, it does not mean that they will cause a fire. When operated in accordance with manufacturer's guidelines, the Fort's Laser SOP, and applicable federal regulations, the risk of fire is minimal.

Depending on the location of the testing or training site, emergency services would be provided by Fort Huachuca medical personnel, or local/county emergency response teams. With regard to the Willcox Playa leased test site, civilian and contractor employees are routinely briefed on the dangers of UXO safety since the site was formerly used for military live-fire operations (USAEPG 1997a).

Additionally, indirect impacts resulting from the use of other devices and equipment associated with the lasers and their platforms also exist. Noise emanating from engines and generators can pose a safety hazard to equipment operators at the individual testing and training sites. Hearing protection is an important part of safety procedures developed by the Army for the operation of equipment and vehicles.

As another safety precaution, the former U.S. Army Environmental Hygiene Agency, now known as the Public Health Command (PHC) conducted analytical studies to detect health hazards of EM emitters and lasers used in EPG operations. Findings of the report by USAEHA, entitled *Non-ionizing radiation protection Survey No. 24-42-0626-91, Radiofrequency Radiation Sources, Tenant Activities, Fort Huachuca, Arizona, 30 April – 4 May 1990* were evaluated. The results of that study are the basis for determining buffer zone distances which are communicated to all EPG testing participants (USAGFH 1992).

Based on the extensive safety guidelines and instructions that would be implemented by Fort personnel during laser testing and training activities, and the established procedures that must

be followed in the event of an accident, the potential risks to human health and safety would not result in any significant impacts.

Alternative Two

Human health and safety impacts under Alternative Two are anticipated to be similar to those associated with the Alternative One. The impacts may be slightly reduced, given the reduction in available testing area available under Alternative Two. No significant impacts are anticipated.

No Action Alternative

The No Action Alternative would not result in any human health and safety impacts.

Cumulative Impacts

Human health and safety services have increased over the years as Sierra Vista and surrounding communities have agreed to provide mutual support with fire and other emergency situations. Better routine medical services and emergency medical services are available for both civilians and military personnel. Serious emergency medical situations at Fort Huachuca still require evacuation to Tucson. However, today the trip takes 12 minutes by air versus approximately 1.5 hours by ground transport. The area is not seen as a hub for specialty medical services and will likely remain at the current level of service for the foreseeable future.

Safeguards of military and civilian personnel are taken seriously and standard operating procedures are dictated both verbally and provided in written form prior to any training or testing activities. With these guidelines in place, it is anticipated that none of the Alternatives would contribute to cumulative impacts on health and safety at the local or regional level.

3.15 Electromagnetic Spectrum

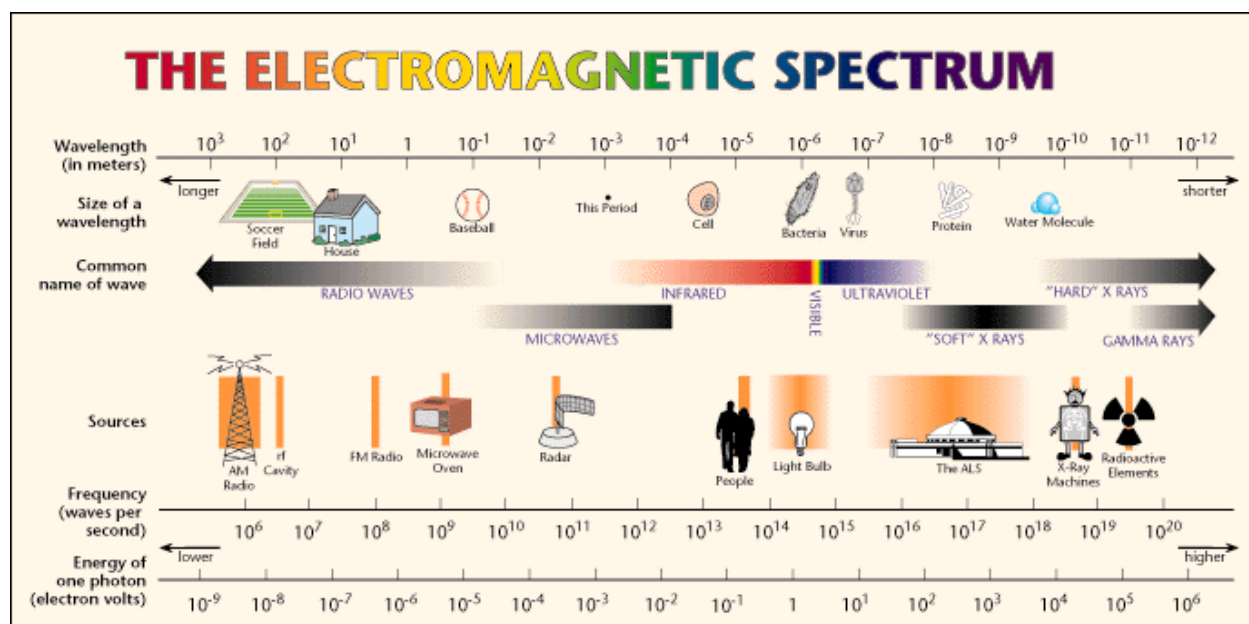
3.15.1 Affected Environment

3.15.1.1 On-post

The EM spectrum is the entire range of electromagnetic radiation, characterized by frequency and wave length. The EM spectrum extends from radio waves which have the longest wavelengths and lowest frequencies, to gamma rays which have the shortest wavelength and highest frequencies. Lasers occur in the infrared and visible portions of the EM as seen in Figure 3.2.

One of Fort Huachuca's unique operational roles for the DoD includes EM testing and training. The metal-bearing mountain chains surrounding Fort Huachuca create a unique topographic "bowl" that blocks external EM interference within the basin. This creates an ideal location for electronics testing and training. The natural topography provides the flexibility of using both military and commercial spectrum for operational and developmental testing.

The limited amount of developed land that surrounds the Installation provides an EM environment that is an unparalleled asset for testing. Due to the operational setting, the communications and electronic equipment testing function of the EPG moved to Fort Huachuca in 1954. The capability of both testing and training use made Fort Huachuca a unique spectrum asset for the Army. An area surrounding Fort Huachuca known as the Buffalo Soldier Military Electromagnetic Range (MER) is one of the only U.S. locations where regional electronic equipment testing can be effectively conducted. The MER is a frequency coordination zone protected by federal mandate (JLUS 2007). The EM environment is also a critical resource for many other tenants and organizations operating on the Installation and plays a vital role in the success of testing missions conducted by the EPG.



Source: LBNL 2012

Figure 3-2. Electromagnetic Spectrum

Spectrum-related activities associated with Fort Huachuca are subject to the policies and procedures of several Federal agencies. At the highest level, the spectrum management authority for all Federal agencies is the National Telecommunications and Information Administration, part of the Department of Commerce. The policies and procedures for spectrum use by Federal agencies are contained in the Manual of Regulations and Procedures for Federal Radio Frequency Management, commonly referred to as the National Telecommunications and Information Administration (NTIA) Manual. In addition to the NTIA, the DoD has well established and detailed policies and procedures for the use of the EM spectrum by DoD agencies. Finally, the U.S. Army has its own policies and procedures guiding the spectrum-dependent activities of Army entities. Regulations and procedures relevant to Army spectrum management issues are addressed in AR 5-12.

Principal responsibility for spectrum management within the U.S. Army rests with the Director of the Army Spectrum Management Office (ASMO) who is also the Army Spectrum Manager. The Director of ASMO reports to the Army Chief Information Officer (CIO)/G6. A number of Federal agencies have frequency assignments for radio frequency (RF) systems within the EM spectrum surrounding the Fort. All Federal agencies that use the EM spectrum have an office designated to perform the spectrum management function; typically this office reports to the agency's Chief Information Officer. Like DoD agencies, these agencies obtain authorized frequency assignments through the NTIA and the frequency assignment process contained in Chapter 8 of the NTIA manual. Non-Federal Government systems also contribute to the EM environment at Fort Huachuca. Commercial, state and local authorities are licensed to use the EM spectrum by the Federal Communications Commission.

3.15.1.2 Off-post

Sunnyside

Sunnyside is located within the MER. The Sunnyside site proposed for Class 1 laser testing is also used for other EM testing by the EPG. All federal regulations regarding EM spectrum usage that apply on-post also apply at the Sunnyside site.

Willcox Playa

Although Willcox Playa is located outside the boundary of the MER, it is still used for EM testing by the Fort. Federal regulations regarding EM spectrum usage apply to this area; however MER requirements would not apply.

3.15.2 Environmental Consequences

Alternative One (Proposed Action)

The wavelengths of lasers proposed for use under the Proposed Action would fall between infrared and ultraviolet, including visible wavelengths, on the EM spectrum (Figure 3-2). Ultraviolet radiation occurs at wavelengths between 180 and 400 nanometers (nm); visible radiation between 400 and 700 nm; and infrared radiation between 700 nm and 1 millimeter (mm). Lasers would not interfere with the Fort's other sources of EM testing, such as radar or radio communications systems, which operate on completely separate frequencies. However, the Fort's Spectrum Manager is notified of all laser testing activities.

Pre-testing coordination between the USFS Sierra Vista District Ranger and other law enforcement agencies (i.e., Department of Homeland Security and Cochise County Sheriff's Department) regarding testing interference of the respective frequencies helps to minimize potential impacts. Interference with any agency's communications may not occur outside of approved timeframes and/or approved conditions listed in the special use permit issued for the Sunnyside Test Site. A list of mitigation measures that are taken to avoid interference with frequencies must be provided to the District Ranger prior to start of any "jamming" activities.

Alternative Two

Impacts associated with implementation of Alternative Two are anticipated to be identical to those resulting from implementation of Alternative One. No impacts are expected.

No Action Alternative

Implementation of the No Action Alternative would not result in any impacts to the EM Spectrum.

Cumulative Impacts

The three largest land owners within the MER include the State Land Department, USFS, and private entities. The EPG's future expansion of test sites within the MER will likely involve leasing agreements with one or more of those groups or a state or local transportation agency, and land use and EM frequency coordination made a part of the lease agreement as necessary to protect any public or agency-related interest present at the site.

There are no adverse impacts to the EM spectrum resulting from the implementation of any of the Alternatives. Therefore, there are no cumulative impacts anticipated.

4.0 FINDINGS AND CONCLUSIONS

A summary of the potential impacts and measures to minimize adverse impacts is provided in Table 4-1. Based on the analysis contained herein, this EA concludes that neither the implementation of Alternative One (Proposed Action), Alternative Two, nor the No Action Alternative would constitute a major federal action with significant impact on human health or the environment. It is recommended that a Finding of No Significant Impact be issued to complete the NEPA documentation process.

Table 4-1. Summary of Potential Impacts and Measures to Minimize Impacts for Alternative One (Proposed Action) and Alternative Two

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
Land Use		X		No significant direct or indirect impacts to Land use are anticipated under Alternatives One or Two. All testing and training events are evaluated and scheduled through appropriate channels prior to the start of training or testing exercise to reduce/eliminate scheduling conflicts. All proposed testing and training would occur on existing training areas and would not alter current land use. The conversion of the taxiway and construction of the aircraft covering structure on the East Range would not result in any significant impacts to land use.
Topography, Geology, and Soils		X		No significant impacts to topography, geology, or soils would result from the implementation of Alternatives One or Two. The Fort actively works to reduce erosion on the Installation and all testing, training, and construction activities associated with the Proposed Action would implement best management practices to reduce any impacts to soils. Minor, short-term impacts to soils would be expected during the conversion of the taxiway and construction of the aircraft covering structure on the East Range.
Hydrology and Water Resources		X		No significant impacts to water resources are anticipated as a result of the implementation of Alternatives One or Two. Activities associated with the Proposed Action would not increase the demand for groundwater and would not directly impact any surface water on- or off-post. Minor, short-term impacts to surface water drainage could occur during the construction of the aircraft covering structure and conversion of the taxiway on the East Range. Additionally, long-term, minor impacts to surface water drainage on that site, may result as pervious surfaces are converted to impervious surfaces. Appropriate stormwater management design and implementation on site would minimize these impacts.

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
Biological Resources		X		No significant direct or indirect impacts to biological resources are anticipated. Potential risks to biological resources include wildlife eye and skin damage, and the potential for fires in dry habitat. Compliance with appropriate safety guidelines and regulations, and the Fort's Laser Standard Operating Procedure would minimize these risks. Some short-term minor impacts to biological resources may occur during construction activities on the East Range; however they would be minimal and would only last the duration of the construction.
Cultural Resources			X	No direct or indirect impacts to cultural resources are anticipated as a result of the implementation of Alternatives One or Two. All proposed laser and testing activities would avoid areas with known cultural resources. The construction of the aircraft covering structure and conversion of the taxiway on the East Range would not impact any known cultural resources. In the event that an unknown archaeological resource is discovered during testing, training, or construction activities, all activities would cease and the appropriate Fort personnel would be notified.
Air Quality		X		No significant direct or indirect impacts to air quality are anticipated under Alternative One or Two. No new generators are included in the Proposed Action. Any new generators used to power the lasers will be considered new sources of criteria pollutants and will trigger a permit modification to the air operating permit. Indirect impacts from generators and other diesel-powered vehicles and equipment used as laser platforms during testing activities would not be expected to significantly increase overall air emissions on- or off-post. Construction vehicles and equipment associated with the East Range construction/taxiway conversion would have minor, short-term impacts to overall air emission, primarily from vehicle exhaust and dust generation during construction.
Noise		X		There would be no significant direct or indirect impacts to the noise environment under Alternative One or Two. The lasers proposed for use would not directly produce any significant audible sound. Indirect impacts associated with the platforms the lasers are mounted on, may result during testing and training activities. However, all proposed laser platforms are already in use by the Fort. Noise impacts associated with construction activities on the East range would be minor and short-term.
Visual Resources		X		No significant impacts to visual resources would result from the implementation of Alternative One or Two. All of the laser platforms discussed within this PEA are already in use by the Fort. Incorporation of the lasers onto existing mobile and stationary platforms would not significantly alter the platforms. Testing and training activities using visible laser beams would occur and may be visible on-and off-post. However, given the temporary nature of these activities, no permanent impacts to the overall

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
				aesthetics of the area would result. There would be no significant impact resulting from the conversion of the taxiway and construction of the aircraft covering structure, since this area is in an area not visible from off-post populated areas and is already being used for aircraft activities.
Socioeconomics		X		There would be no significant direct or indirect impacts to local or regional population or economy. Minor short-term beneficial impacts to local sales economy may result during construction-related activities or during testing and training activities. However, none of the activities associated with the Proposed Action would result in an increase in population or result in any adverse impacts to minority or low-income areas.
Transportation and Circulation		X		No significant direct or indirect impacts to transportation or circulation would result from the implementation of Alternative One or Two. Minor, short-term impacts to local roadways on and around the Fort and off-post testing areas may occur during laser testing and training events. However, no significant increases in traffic volume are anticipated. All testing and training activities must be coordinated and scheduled through appropriate channels, therefore no significant impacts to airspace or range access are anticipated. Construction activities on the East Range may increase traffic volumes on the Fort during construction; however these impacts would be less than significant and short-term.
Utilities		X		There would be no significant direct or indirect impacts to utilities. None of the proposed laser testing or training activities would significantly increase demand on any on-post utilities. No off-post utilities are used during testing activities at the off-post leased sites. And, no new utilities are necessary to support new construction on the East Range.
Hazardous and Toxic Substances		X		No significant direct or indirect impacts resulting from the use of hazardous and toxic substances are anticipated. All use, storage, transport, and disposal of hazardous substances and hazardous waste must comply with applicable laws and regulations. Lasers proposed for use at the Fort would contain little to no hazardous substances and would only generate hazardous by-product or waste from exhausted batteries that may be used to power the lasers. Any hazardous waste generated during construction activities at the East Range would be disposed of off-post by the contractor, in compliance with applicable laws and regulations.

Resource Area	Level of Anticipated Impact			Summary of Potential Impacts and Measures to Minimize Impacts
	Significant	Less than Significant	No Impact	
Health and Human Safety		X		No significant impacts to health and human safety would result from the implementation of Alternative One or Two. Proper use, storage, and disposal of the lasers, along with the use of appropriate personal protective equipment, and compliance with applicable operating procedures and instructions would greatly reduce the risk of any human health or safety impacts. Impacts associated with construction activities on the East Range would be minor, and temporary in nature.
Electromagnetic Spectrum			X	There would be no impacts to the electromagnetic spectrum under Alternative One or Two. The lasers proposed for use at the Fort would range from infrared to ultraviolet, including visible radiation. These types of radiation are not known to interfere with the other types of radiation used on the Fort, specifically radio and other communications methods.

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FORMAT PAGE

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FORMAT PAGE

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FORMAT PAGE

APPENDIX A

FORMAT PAGE

FORT HUACHUCA



Laser SOP

30 November 2012

DEPARTMENT OF THE ARMY

INSTALLATION MANAGEMENT COMMAND
DIRECTORATE OF PLANS, TRAINING, MOBILIZATION AND SECURITY
72 CHRISTY AVENUE
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IMWE-HUA-PL

Safety

LASER TESTING AND OPERATIONS
FORT HUACHUCA, ARIZONA

	Paragraph
Purpose.....	1
Scope.....	2
Policy.....	3
Responsibilities.....	4
References.....	5
Proponent.....	6
Appendix A, Laser Safety Practices for Ground-Based and Airborne Laser Operations.....	A-1
Appendix B, Safety Responsibilities for Laser Testing.....	B-1
Appendix C, Laser Range Utilization Request.....	C-1
Appendix D, Memorandum of Commander's Certification.....	D-1

1. Purpose. To establish policies, define responsibilities and prescribe practices that will ensure personnel safety during FDA approved commercial and government laser operations and the FDA non-approved (i.e., military exempt for national defense, training and war time) lasers operations within designated laser range, Fort Huachuca, Arizona.

2. Scope. This Standard Operating Procedure (SOP) applies to all military, civilian and contractor personnel operating at Fort Huachuca, Arizona.

3. Policy. All requests for scheduling the laser range shall be made through the Fort Huachuca Range Safety Office at 520-533-1014, with at least 30 days notice.

a. All requests must be accompanied with a thorough Composite Risk Management (CRM) Worksheet (DA Form 7566) an Operations Order (OPORD) or Scenario depicting the scope of the operation and all safety procedures being utilized, as well as laser class and facts sheet.

b. Laser class restrictions will be implemented as follows:

1. East Range – Class I – IV
2. West Range – Class I only
3. South Range (Ranges 6, 8, 9, 10) – Class I – III
4. Wilcox Playa – Class I – IV (with appropriate mitigation processes)

4. Responsibilities. Accident prevention is the responsibility of all personnel. All personnel are expected to refrain from unsafe acts and to conform to safety rules and regulations.

- a. The Fort Huachuca Range Operations Officer is responsible to the Commanding General, Fort Huachuca, Arizona for the control, supervision, safety, issuance, clearance, and coordination of all range activities, facilities and training areas on this installation.
- b. The Range Officer in Charge (OIC) and Range Safety Officer (RSO) shall be appointed by an accountable supervisor on a memorandum signed by their commander, and approved by the Fort Huachuca Range Operations Laser Safety Officer (LSO) and the Range Operations Officer. The OIC and RSO will be technically qualified by virtue of education, training or experience as determined by the LSO. The OIC and RSO must also be certified through the Fort Huachuca Installation Range Safety Certification Program, IAW AR 385-63, prior to using the Laser Range East. This course is NOT a laser training course, but will inform the OIC and RSO of their responsibilities and the requirements while training on Fort Huachuca. The OIC must be an E6/GS-7 or above and the RSO must be an E5/GS-5 or above.
 - (1) The OIC for any laser use shall be either a fully qualified government or military person and will be in charge of the group conducting training/testing and will be fully knowledgeable of the system and will operate IAW Appendices A and B of this SOP. The OIC will:
 - (a) Coordinate the scheduling of laser operations on the range with the Fort Huachuca Laser Safety Officer and the Range Operations Officer. The Fort Huachuca Laser Utilization Request Form will be used. The request form is available through Fort Huachuca Range Operations and Appendix E of this SOP.
 - (b) Prior to occupying the laser range and upon completion of the laser range, the OIC must process in and out through the Fort Huachuca Range Operations Fire Desk.
 - (c) Inform the RSO of all procedures of the laser range.
 - (d) Inform the RSO of the potential hazard of any operations to be performed.
 - (e) Establish and maintain radio communication with the Fort Huachuca Range Operations Fire Desk.
 - (f) Ensure the appropriate laser eyewear and any required Personal Protective Equipment (PPE) is available for the number of personnel participating in the laser operations.
 - (g) Ensure that each person involved in the laser operations have had their baseline laser eye examination.
 - (2) The RSO will be a fully qualified government or military person responsible for overseeing the safety operations during laser operations and must be fully knowledgeable of the system and operate IAW Appendices A, B and C of this SOP. The RSO will:

- (a) Ensure that personnel operating lasers and supporting equipment receive adequate instructions that will provide them an understanding of the hazards associated with that particular laser and prescribe, if needed, proper protective equipment.
- (b) Conduct a "Pre-admission/Safety Brief" prior to laser operations. The brief shall include as a minimum:
 - 1. Maps depicting the targets and/or target areas and their laser hazard area.
 - 2. Drawings and/or photographs of the target/targets to be utilized.
 - 3. Run-in headings and flight profiles to be used (Airborne Laser Operations).
 - 4. Permissible firing fans.
 - 5. Radio frequency to be employed.
- (c) Preclude the entry of unauthorized personnel onto the range.
- (d) Approve all range and test setups.
- (e) Establish and maintain two-way communications with all down range personnel to ensure that protective laser eyewear is in place before activation of the laser/laser system, and to notify of any hazardous conditions.
- (f) Close all gates and post appropriate laser warning signs and notices at designated locations.
- (g) Assure that adequate danger zones have been established and that strict control of traffic is maintained as necessary.
- (h) Check the range of all specular reflectors and remove as required.
- (i) Enforce laser standard operating procedures, laser safety rules and special precautions.
- (j) Establish first aid procedures, which will be developed in coordination with the local medical authority that provides health services to the installation. First aid should not be attempted for damage produced by laser energy to human eye tissue. Therefore, prompt reporting to medical treatment facilities is imperative for known or suspected laser injuries.
- (k) Ensure that a litter capable vehicle, litter, Combat Lifesaver, and a driver capable of medical evacuation are on site at all times.
- (l) Coordinate the laser testing with other activities within the laser range area and furnish all required information to control tower operations

(airborne laser testing) and authorized ground control stations (ground-based laser testing) associated with the laser testing.

(3) Work Party Supervisor in charge of a maintenance party planning to enter the controlled area during cold times (no laser operations) shall:

(a) Obtain clearance from the OIC before entering the area. The request for clearance shall be during cold times only and shall include:

1. Nature and location of work to be done.
2. Name of person in charge of the work party.
3. Number of people in the work party.
4. Expected duration of stay in the area.

(b) Establish and maintain radio contact with the OIC at all times while on site.

(c) Ascertain work party is confining their activities to the area for which the clearance is granted and follow the prescribed routes to and from the area.

(d) Cancel all clearances when leaving the test area.

(4) Laser Operating Personnel will be responsible for the following:

(a) Know and adhere to this SOP, safety rules and special instructions.

(b) Immediately report to the RSO and/or OIC any known or suspected laser accident or personal injury.

(c) Have certification that a baseline laser eye examination has been administered.

(d) Assure that operation of laser equipment will not injure other personnel who may be present.

(e) Be in direct two-way communication with the OIC and/or RSO at all times.

(f) Wear appropriate laser eyewear when lasers are in operation.

(5) Visitors who are present to witness a laser test are required to do the following:

(a) Obtain clearance from the OIC.

(b) Bring and wear the appropriate laser protective eyewear for the wavelength of the laser being tested.

5. Exposure Response and Reporting Requirements.

a. Response to laser injuries. Any Soldier or civilian employee with a confirmed or suspected, unprotected exposure to a class 3B or 4 laser should have a diagnostic vision examination as soon as possible (no later than 24 hours) by an optometrist or ophthalmologist at the nearest military treatment facility (MTF). Immediate notification of injury shall be reported to Fort Huachuca Range Operations. Documentation of the injury should include a history of the event and a thorough vision and ocular examination. The examination should include ocular history, distance visual acuity, Amsler grid (or similar central visual field) test, slit lamp examination, ocular fundus evaluation through dilated pupil, ocular fundus photographs that depict the extent of injury or lack of injury, and photographs of any external or anterior segment injury. If ophthalmic photographic capabilities are not available, then a detailed representation of the finding may be hand-drawn or the patient should be referred to the nearest MTF (or authorized civilian provider) that has such capabilities. Individuals with confirmed exposure should be examined by a retinal specialist.

b. Reporting.

(1) Once the optometrist or ophthalmologist suspects or confirms an acute laser overexposure incident, he/she will notify:

(a) The Installation Laser Safety Officer (LSO) and/or Radiation Protection Officer (RPO).

(b) The Tri-Service Laser Injury Hotline (DSN 798-3764 or commercial 937-938-3764 or 1-800-473-3549) (email: esoh.service.center@wpafb.af.mil).

(c) The US Army Institute for Public Health (USAIPH) Laser/Optical Radiation Program (DSN 584-3932/2331 or commercial 410-436-3932/2331 or 1-800-222-9698) (email: laserincident@amedd.army.mil).

(d) The USAIPH Tri-Service Vision Conservation and Readiness Program (TVCRP) Manager (DSN 584-2714 or commercial 410-436-2714) (email: laserincident@amedd.army.mil). After normal duty hours, contact the USAIPH personnel via the staff duty officer (DSN 584-4375 or commercial 410-436-4375 or 1-800-222-9698).

(2) Information to be reported includes:

(a) Patient name, grade, and SSN (based on PII protection requirements).

(b) Unit name.

(c) Hospital providing care and registration number.

- (d) Exposure date and source.
 - (e) Duty being performed at the time of the incident.
 - (f) Summary of symptoms and evaluation.
 - (g) Any follow-up information
- (3) The Unit LSO or RPO, with the help of the safety office or representative, will secure the laser in question (Do not send the laser equipment to maintenance for repairs). The USAIPH Laser/Optical Radiation Program will initiate a technical evaluation of the incident and of the laser equipment involved and will render a technical report as soon as possible after the incident. The U.S. Army Medical Research Detachment of the Walter Reed Army Institute of Research (USAMRD-WRAIR) Ocular Hazards Division, in cooperation with the USAIPH TVCRP, will coordinate the initial and follow-up care of the patient and will render a report on the patient's status and prognosis.

6. References.

- c. AR 385-63, Range Safety
- d. DA PAM 385-63, Range Safety
- e. TB MED 524, Occupational and Environmental Health: Control of Hazards to Health from Laser Radiation.
- f. MIL-HDBK-828B w/Change 1, Range Laser Safety
- g. Joint Publication 3-09.3, Close Air Support

6. Proponent.

The proponent for this SOP is DPTMS, Range Operations, Fort Huachuca, AZ.

WESLEY A. LEISINGER
Director of Plans, Training
Mobilization and Security

Appendix A

Laser Safety Practices for Ground-Based and Air Laser Operations

The laser safety practices for ground-based and air laser operations that need to be instituted to safely conduct laser operations are:

1. Laser safety requirements as defined in TB MED 524, ANSI Z136.1, AR 385-63, DA PAM 385-63, MIL-HDBK-828B w/Change 1, Joint Publication 3-09.3 and this SOP shall be strictly adhered to during laser operations.
2. All employees assigned to work with laser equipment will receive full instructions with respect to the hazards associated with the equipment, the laser beam and with the proper use of the equipment. An up-to-date roster of personnel authorized to use Class 3B and Class 4 laser equipment will be maintained by the unit and a copy submitted to Range Operations.
3. The target and the target areas must be free of any specular reflectors (mirrors, glass, still water, etc.), unless they are necessary for the purpose of the operation. In such cases, specular surfaces will be oriented to assure that hazardous reflections will not be directed into controlled areas or toward unprotected personnel, and in which the beam will not leave the defined perimeters of the Laser Range. Where specular surfaces exist in the target area, optical instruments such as field glasses or telescopes will not be used to observe the target area unless they are fitted with appropriate attenuating filters. For Airborne Laser Operations, a flyover of the range is also required at the onset of the laser test, *in addition* to the initial ground survey of the range.
4. The OIC and RSO must be constantly alert for any unauthorized personnel wondering within the boundaries of the Laser Range. Hunting season occurs throughout the year on Fort Huachuca, as well as undocumented illegal alien traffic.
5. Laser operations warning signs, **in addition to those required by this SOP**, shall be posted at the discretion of the OIC and/or RSO to warn unauthorized personnel of the laser operations.
6. A "Safety Brief" shall be conducted prior to laser operations. The brief shall include at a minimum:
 - a. Maps depicting the targets and/or areas and their laser hazard area
 - b. Drawings or photographs of the target/targets to be utilized
 - c. Permissible Firing Fans
7. A two-way communication link between the OIC, RSO, laser operator, and down range personnel shall be maintained throughout the laser operations. During Airborne Laser Operations, the pilot must also maintain contact with the OIC.
8. The OIC must maintain constant radio contact with the Fort Huachuca Range Operations during testing and will be required to conduct communications checks every 30 minutes during hot times.

9. System equipment requiring electrical power shall be adequately tested for proper operation prior to operations and operating personnel shall make certain that no sub-system electrical overload exists.
10. Before lasing, operating personnel shall ensure that the laser is pointing down range and aimed at the ground or a point on the target within the firing parameters as submitted to Range Operations. For safety reasons, it is recommended that only lasers mounted on a stabilized platform be used down range against the targets within the Laser Range. A 10-mil buffer must be maintained around all target areas.
11. During Airborne Laser Operations, the aircraft must be on a run-in heading of 90 degrees magnetic north when designating or range finding targets located within the Laser Range. If a different run-in heading is required, contact the Range Operations Laser Safety Officer. A 10-mil buffer must be maintained around all targets areas and no airborne laser will be fired outside of the defined boundaries of the Laser Range.
12. All personnel in the immediate area of the laser firing position must be behind the operator while the laser is in use. Personnel should never wander into the beam path, its associated buffer, or the laser target area without appropriate laser eye protection. Such eye protection shall have the appropriate optical density equal to or greater at the laser wavelength.
13. Personnel must report to the OIC and/or RSO immediately on any suspected injury or defective equipment (e.g., misalignment of the laser beam with the pointing optics) so that appropriate action can be taken.
14. In the event an unsafe condition or a marginally safe condition is found to exist in project equipment (electrical and/or mechanical installation), operations shall be suspended until the deficiency is corrected. The laser operator shall immediately terminate power to the laser system should they observe any unsafe condition, including any unprotected or unauthorized personnel entering the area.
15. Only the authorized target may be designated or ranged.
16. Do not designate or range aircraft.
17. Prior to lasing, the target must be positively identified under the crosshairs of the scope or on the operator's monitor. Upon firing the laser, the laser operator will notify everyone involved in the operation "LASER GO." Upon completion of the test run, the laser shall be turned off, everyone involved in the operation will be notified "LASER STOP" and arm/enabled power removed before the aircraft leaves the range area.
18. The laser will not be operated or used experimentally outside the range area without such operation being specifically authorized by the Fort Huachuca Laser Safety Officer and the Fort Huachuca Range Operations Officer.
19. The laser exit port of all ground based laser systems will be covered by an opaque dust cover when the laser is located outside the range area or is not in use.
20. No special precautions are necessary for firing during rain, fog or snowfall. However, laser operations must cease if water begins ponding either on the ground, snow or ice. In the event

that the installation is closed due to inclement weather conditions, the Laser Range will also be closed.

21. In the event of electrical storms with excessive winds, all laser tests shall be discontinued. During Airborne Laser Operations, should marginal wind conditions exist, the OIC, RSO and pilot shall consult as to the safety of continuing airborne operations.

22. All Class 3B and Class 4 lasers shall not be directed above the horizon unless coordinated with the Fort Huachuca Laser Safety Officer and the Range Operations Officer.

23. Upon completion of the operation, the laser shall be turned off and disconnected from its power supply and OIC is notified of the cessation of laser operations.

24. Laser safety eyewear exposed to very intense energy or power levels may lose effectiveness. A field expedient method to determine if laser eyewear is defective is to visually hold eyewear up to a strong light. Any holes, cracks or damage would indicate defects. Defective eyewear should be discarded unless they can be repaired to meet the specifications for new eyewear. If the eyewear is designed to serve also as impact resistant safety spectacles, replaced filter lenses should meet the requirements of ANSI Z87.1.

25. Unattended hazardous laser operations are not authorized and will not be permitted at the Laser Range. However, if a non-hazardous system is intended for unattended operation and it's design assures personal safety, a request must be submitted to the Fort Huachuca Laser Safety Officer not less than 30 days prior to proposed operating dates. The Fort Huachuca Laser Safety Officer and the Range Operations Officer approval must be done before such operations can take place.

26. Only qualified personnel will be permitted to work on laser systems. Non-maintenance work should not be performed on laser systems until the power is off and the residual charge in any power supply capacitors has been "bled-off."

Appendix B

Safety Responsibilities for Laser Operations

Overall responsibility for safety control during laser operations is assigned to the OIC. The following is a list of responsibilities delegated to the OIC and RSO when a laser test is about to begin:

1. Officer In Charge (OIC) will:

a. Complete a Laser Range Utilization Request (Appendix D) no less than 30 days prior to the start of operations and route through for signatures.

b. Obtain approval for the operation of lasers from the Fort Huachuca Laser Safety Officer.

c. Coordinate the scheduling of the Laser Range with the Range Operations scheduler.

d. Be familiar with FH REG 385-8, Fort Huachuca Training and Range Regulations, and Field Manuals, Technical Manual's and/or manuals applicable to the laser being used. Fort Huachuca Regulations can be obtained from Range Operations (Bldg 15424).

e. Ensure that any non-standard operation, such as smoke, pyrotechnics and digging are coordinated no less than two weeks prior to the start of the operation. Overlays, Records of Environmental Consideration (REC), Fire Plans and Risk Assessments may be required for non-standard testing. Initial coordination will be made with the Range Operations Officer at (520) 533-7095.

f. Ensure that the OIC and RSOs are validated by a command certification memorandum (Appendix E), briefed by Fort Huachuca Range Operations and have valid Range Safety Certification Cards in their possession.

g. Process in through the Range Operations Fire Desk (Bldg 15424) prior to occupying the laser range, and process out through Range Operations Fire Desk at the conclusion of operations.

h. Sign for and be responsible for accountability and turn in of all range facility equipment, radios and keys.

i. Open the range and establish radio communications with Fort Huachuca Range Operations immediately after entering the range facility. Ensure that radio communications are maintained and monitored on dedicated radio/phone until the facility is cleared. Radio checks will be completed every 30 minutes while range is in a "hot status".

j. Ensure red flag is displayed from the range facility flagpole before requesting "hot status." The OIC will request a "hot time" prior to the start of laser operations. Range Operations will be notified of any cease-fire exceeding 30 minutes. At the completion of lasing, the OIC will request a "cold time" and give an approximate time for clearing the range facility.

k. Ensure that barricades are in place and medical evacuation vehicle and driver are available. Ensure danger signs are at designated locations.

l. Designate each person a specific task and brief the entire group so that everyone understands the test operation.

m. Be present with the RSO during all lasing operations on the facility.

n. Ensure that a safety and information briefing is conducted for all personnel on duds, the use of eye protection, seasonal warnings, laser hazard warnings and “cease-fire” prior to laser operations.

o. Ensure that all safety procedures are rigidly followed.

p. Physically check range for safety violations.

q. Maintain radio communication with RSO and all personnel involved. Lasing will cease immediately if communication is lost and will not resume until OIC is confident that reliable communications has been established.

r. Provide indoctrination of personnel as required for safety operations.

s. Ensure range has been checked for flat and specular surfaces and have been either removed or covered. The OIC must notify Range Operations that the area has been inspected and found free of specular surfaces prior to receiving permission to go “hot.”

t. Approve all laser operations set-ups. Make final determination that it is safe to fire.

u. Notify RSO to close access to the laser range.

v. Terminate range operations when an unsafe condition occurs.

w. Call in a cold time with Range Operations at the end of the day.

x. In the event of the cancellation of any day(s) during the scheduled range time, the OIC MUST notify Range Operations of the cancellation no less than one day prior to the scheduled range time.

2. Range Safety Officer (RSO)

a. Notify the OIC that pre-operation preparations are beginning.

b. Ensure that lasers are properly mounted and are in proper location.

c. Ensure that a vehicle and a driver capable of medical evacuation are available. For eye injuries, the medical evacuation vehicle can be accomplished by the unit. In the event of more serious injuries, such as a fall, head injury or other serious injury, call 911 and inform Range Operations immediately.

- d. Conduct a safety briefing for all personnel. Safe operation of the laser being used and any known hazards will be outlined and explained.
- e. Visually inspect the range for reflective surfaces, removing any that exist.
- f. Obtain latest weather information.
- g. Ensure that the visibility level is such that all targets to be lased are clearly visible.
- h. Establish and maintain continuous communication with range personnel in the target area.
- i. Notify all teams to begin pre-operations preparations.
- j. Receive notification that pre-operations preparations have been completed.
- k. Obtain OIC approval for the operation and verify airspace clearance.
- l. Notify all personnel that a hazardous condition exists.
- m. Ensure all personnel wear eye protection in the range facility during lasing as required. Eyewear must be approved for the wavelength and the laser device being fired.
- n. Verify range flag is in place.
- o. Notify all personnel that laser operations will begin in 5 minutes.
- p. Obtain OIC approval for laser activation.
- q. Notify all personnel of lasing conditions "LASER GO."
- r. After operations are complete, notify the OIC and all personnel when eye safe conditions exist "LASER STOP."

Annex C – Laser Range Utilization Request

LASER RANGE UTILIZATION REQUEST						LASER RANGE EAST Fort Huachuca, Arizona					
TEST/OPERATION CLASSIFICATION						TEST/OPERATION NAME					
Test Dates				RANGE OIC			Range Certification Expiration Date		TELEPHONE		
From		To									
				RSO			Range Certification Expiration Date		TELEPHONE		
Are nights/weekends required? <input type="checkbox"/> Yes <input type="checkbox"/> No											
Number of Personnel						TEST/OPERATIONS PLAN STATUS					
CIVILIAN	OFFICER	ENLISTED	CONTRACTOR	VIP'S	FOREIGN	<input type="checkbox"/> Attached <input type="checkbox"/> Forthcoming <input type="checkbox"/> Brief description on back					
LASER SYSTEMS(S) INFORMATION											
LASING MEDIUM											
CLASS (I, II, IIIA/B, IV)											
WAVE LENGTH											
BEAM DIVERGENCE											
CW OR PULSE											
OUTPUT POWER											
OTHER SAFETY HAZARDS (noise, gasses, etc.)											
NOHD Unaided											
NOHD Aided 7x50											
USAPHC CERTIFIED?											
NAME AND TITLE, LASER USER TEAM CHIEF					SIGNATURE				DATE		
NAME AND TITLE OF LASER SAFETY OPERATIONS APPROVING OFFICER					SIGNATURE				DATE		
SUPPORT REQUESTED											
FIELD SUPPORT PERSONNEL/FUNCTION <input type="checkbox"/> Check here if not required											
DAILY SCHEDULE (Days/Hours) PLEASE ATTACH DAILY SCHEDULE TO THIS FORM											
AIRCRAFT INVOLVED		FTAs REQUIRED		TYPE AND NO. OF AIRCRAFT		FUEL/TIMES		ALTITUDES			
DOWN RANGE REQUIREMENTS (targets, smoke, mowing, gravel, etc.) <input type="checkbox"/> Check here if not required											
NAME AND TITLE OF RANGE AND SCHEDULING APPROVING OFFICER					SIGNATURE				DATE		

APPENDIX D

LETTERHEAD

OFFICE SYMBOL

DATE

MEMORANDUM FOR Range Operations, Fort Huachuca, AZ

SUBJECT: Commander's Certification of Laser Range Officer in Charge (OIC) and Laser Range Safety Officer (RSO)

1. The personnel listed below are certified to perform duties as the OIC/RSO for the Fort Huachuca Laser Range for my unit. They have been thoroughly trained and have demonstrated a complete knowledge of laser and/or unmanned aerial systems (UAS) that will be used on the laser range at Fort Huachuca.

2. The individuals named below know and understand the requirements directed by AR 385-63, DA PAM 385-63, FH Reg 385-8, FH Reg 385-3 and all pertinent Army and DOD Laser and UAS regulations. They are additionally aware that they must have a current Range Certification on file at Range Operations while acting in the capacity of OIC/RSO.

3. NAME GRADE/RANK LAST FOUR

4. POC for this action is the undersigned at (xxx) xxx-xxxx.

**SIGNATURE BLOCK OF
COMMANDER**

FORMAT PAGE